



WORLD TRADE
ORGANIZATION

World Trade Report 2012

Trade and public policies:
A closer look at non-tariff measures in the 21st century



What is the World Trade Report?

The World Trade Report is an annual publication that aims to deepen understanding about trends in trade, trade policy issues and the multilateral trading system.

Using this report

The 2012 World Trade Report is split into two main parts. The first is a brief summary of the trade situation in 2011. The second part focuses on the special theme of non-tariff measures in the 21st century.

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Acknowledgements

The *World Trade Report 2012* was prepared under the general direction of the WTO's Deputy Director-General Alejandro Jara and supervised by Patrick Low, Director of the Economic Research and Statistics Division. The writing of this year's report was coordinated by Marc Bacchetta and Cosimo Beverelli. Work on individual sections was coordinated by Alexander Keck, Coleman Nee, Roberta Piermartini and Michele Ruta.

The authors of the report were: Marc Bacchetta, Cosimo Beverelli, Robert Gulotty, John Hancock, Alexander Keck, Gaurav Nayyar, Coleman Nee, Roberta Piermartini, Michele Ruta and Robert Teh (Economic Research and Statistics Division); Lee Ann Jackson (Agriculture and Commodities Division); Alan Yanovich (Appellate Body Secretariat); Devin McDaniels and Erik Wijkström (Trade and Environment Division); Antonia Carzaniga and Hoe Lim (Trade in Services Division). Michael Ferrantino, Paul Kalenga and Robert Staiger wrote background papers. Other written contributions were provided by Hildegunn Nordås and Melvin Spreij. The International Trade Centre provided useful data processed specifically for this report. Particular acknowledgement is owed to Gabrielle Marceau, Nadia Rocha and Roy Santana for their many suggestions on the Report.

Statistics were provided by the Statistics Group of the Economic Research and Statistics Division, coordinated by Hubert Escaith, Julia de Verteuil, Andreas Maurer and Jürgen Richtering. The Agriculture and Commodities Division and the Trade and Environment Division, along with the Statistics Group, provided information and guidance on the Specific Trade Concerns Database. Research inputs were provided by Claudia Böhringer, Pramila Crivelli,

Liliana Foletti, Filippo Gregorini, Jasmin Gröschl, Abigail Hunter, Shruti Kashyap, Gianluca Orefice, Lorenzo Rotunno, Joonas Uotinen and Giulia Zanvettor. Other divisions in the WTO Secretariat provided valuable comments on drafts at various stages of preparation. The authors wish to acknowledge the advice received from several colleagues in the Agriculture and Commodities Division (Gretchen Stanton), the Appellate Body Secretariat (Carlo Gamberale, Matteo Ferrero), the Legal Affairs Division (Kerry Allbeury, Aegyung Jun, Maria Pereyra), the Trade in Services Division (Hamid Mamdouh) and the Institute for Training and Technical Cooperation (Hector Torres).

The following individuals from outside the WTO Secretariat also made useful comments on earlier drafts: Richard Baldwin, John Beghin, Olivier Cadot, Philippa Dee, Panagiotis Delimatsis, Ian Gillson, Bernard Hoekman, Philip Levy, Mariem Malouche, Sébastien Miroudot, Andrew Mitchell, Jamie Morrison, Alessandro Nicita, Hildegunn Nordås, Dennis Novy, Marcelo Olarreaga, Joost Pauwelyn, Sebastian Saez, Ranil Salgado, Robert Staiger, Joel Trachtman, Tania Voon, John Whalley, Robert Wolfe and Bo Xiong.

The production of the Report was managed by Paulette Planchette of the Economic Research and Statistics Division, assisted by Véronique Bernard, and in cooperation with Anthony Martin, Heather Sapey-Pertin and Helen Swain of the Information and External Relations Division. Anthony Martin and John Hancock edited the report. Acknowledgement is owed to Sebastian Arcq and Mike Blank of Mendeley for help with the bibliography. The translators in the Languages, Documentation and Information Management Division worked hard to meet tight deadlines.

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Foreword by the WTO Director-General



This year's *World Trade Report* takes a fresh look at an old issue. Non-tariff measures (NTMs) have been with us since nations have traded and they have certainly constituted a key element of the work of the GATT and the WTO over the years. I offer seven reasons why it is a good time for the WTO to be thinking about NTMs.

First, NTMs have acquired growing importance as tariffs have come down, whether through multilateral, preferential or unilateral action. Secondly, a clear trend has emerged over the years in which NTMs are less about shielding producers from import competition and more about the attainment of a broad range of public policy objectives. You could say we are moving from protection to precaution. This tendency is discernible in practically every economy, as concerns over health, safety, environmental quality and other social imperatives gain prominence. Moreover, issues such as these take on a more central role in policy as economies develop and incomes grow.

Thirdly, growing public policy concerns add significantly to the complex nature and variety of NTMs deployed by governments, calling for an additional layer of analysis to tease out the trade effects of alternative approaches towards the attainment of declared policy goals. Fourthly, the expansion of the public policy agenda means that NTMs will not follow a path of diminishing relevance like tariffs have done. They will not shrink in importance. Regulatory interventions addressing market failures and international spillovers, with inevitable consequences for trade flows and investment, are here to stay. Fifthly, the increased role of public policy becomes ever more present in international economic relations as globalization intensifies interdependency among nations. Sixthly, all this takes us to where the WTO comes in. I see effective international cooperation on NTMs as a key challenge facing the multilateral trading system in the years ahead. Finally, a related point to the last is that NTMs figure prominently among disputes brought to the WTO.

We have to think differently about the challenges of international cooperation. When trade opening is the core business, the "level playing field" imagery applies. But with public policy, it does not. The aim is not to reduce public policy interventions to zero; it is to render them compatible with the gains from trade. We can no longer think about reduction formulae,

becoming immersed – and sometimes lost – in endless debates about the size of reduction coefficients or exceptions to the coefficients. Reciprocity in negotiations does not have the same meaning. The policy tool box is quite different. The challenge is about finding ways of managing a wider set of policy preferences without disrespecting those preferences or allowing them to become competitiveness concerns that unnecessarily frustrate trade.

Reference is often made to distinctions between shallow and deep integration and between border measures and behind-the-border measures. These are not clear-cut categories and they are used in different ways by different commentators. From the current perspective, where vibrant trade relations must be underpinned by public policy infrastructure with potential trade effects, it makes sense to think in terms of the deeper end of the integration spectrum. Indeed, one way of thinking about the challenges of economic integration is less as a quest for free trade and more as progress towards a global market.

These are some of the issues that the *World Trade Report* takes up this year. Beginning with a short historical overview, the Report shows how the early focus on removing NTMs that were largely surrogates for tariffs has given way to a much subtler and more complex world in which public policy concerns find greater expression in trade relations than they did a few decades ago. The Report tries to identify the major motivations that prompt governments to use NTMs. A simple three-fold distinction is between those NTMs that serve public policy (essentially non-economic issues), those that have an economic focus based on a national welfare-increasing calculus, and those that have a political economy motivation that serves particular interests, and quite possibly do not increase national welfare.

These distinctions cannot always be easily drawn, but they make clear why dealing with NTMs is so much more complicated than simply working for more open markets by removing other barriers to trade. NTMs can generally be expected to have trade effects and they may increase or decrease trade. The outcome depends both on the motivation for the measure and the way it is designed. In keeping with policy trends in the area of NTMs, most of the analysis in the Report focuses

primarily on public policy interventions that are covered by the Technical Barriers to Trade (TBT) Agreement, the Application of Sanitary and Phytosanitary (SPS) Measures Agreement, Article XX of the General Agreement on Tariffs and Trade (GATT), and on the domestic regulation provisions of the General Agreement on Trade in Services (GATS).

Since public policy NTMs are likely to have trade effects, we cannot altogether escape consideration of these effects. Policy-makers may not ostensibly reflect any trade intent in their public policy interventions, but in practice these interventions might be intended to serve a dual purpose. They may be designed or administered in ways that intentionally restrict trade even if their primary purpose is to serve a public policy. This has been referred to as “policy substitution” and it arises either where alternative, less opaque policies (such as tariffs) are unavailable, or where policy-makers wish to conceal the objective. Note also that this problem can arise not so much in the design of a policy but in the way it is administered. When this is the case, finding a systematic remedy can be much more difficult. A good deal of the case load in GATT/WTO dispute settlement has turned on the tension between good public policy and hidden protection.

The issue of policy substitution is but one element of engagement when it comes to international cooperation on NTMs. It is probably one of the easier aspects of cooperation. Matters become more complicated when we think about the trade effects of NTMs not in terms of protectionist intent, but rather in terms of the trade effects of divergent approaches to NTMs. The issue of divergence embodies at least three elements. The first is potentially the least complicated and relates to what we might think of as “incidental or path-dependent divergence” – that is, localized regulatory cooperation may have led to different regulatory approaches that are not grounded in any strong preference, but rather in habit or custom. With no strong vested interest in pursuing divergent approaches, cooperation to harmonize or mutually recognize such diverging approaches should be relatively straightforward. Indeed, this was very much the spirit of the suggestion in last year’s *World Trade Report* on preferential trade agreements that the risks of regulatory divergence could be lessened through a multilateralization of preferential policies in this area.

The second aspect of divergence in national or regional approaches to NTMs is much more delicate. Divergence may reflect something more profound that goes to the root of societal preferences. Value systems may vary across societies in ways that make the idea of harmonization or mutual recognition unacceptable. This could be called “preference divergence” and it would be a brave person who argued that trade should trump such diversity. Yet such realities may carry strong

consequences for the ability of nations to cooperate and benefit mutually from exchange. In such cases, the only sensible approach is to ensure that differences are preserved and respected at minimum cost in terms of any slippage towards a dual-purpose approach to public policy formulation and administration.

The third aspect of divergence concerns the difficulties faced by poorer countries in meeting standards in major markets they serve. One could characterize this as “involuntary divergence”. Developing countries have no motivation for preferring different standards; it is merely a question of capacity. With the necessary will and commitment, this problem is readily amenable to solution. As noted in the Report, a number of capacity-building initiatives are attempting to address this issue.

The economic gains from joint international action to remove protectionist elements in the design and administration of NTMs would be considerable. Work on minimizing regulatory divergence, through harmonization, mutual recognition of standards and action to ensure that private standards do not unduly segment markets, would also promise considerable benefits. Much has already been achieved in managing public policy regarding TBT/SPS measures in the goods area, and domestic regulation in services. The progress that has been made holds promise for further advances.

A good part of this report is dedicated to identifying information available on NTMs and our capacity to analyse and assess the impact of these measures. The review is very useful, but it does not make for cheerful reading. We know far less than we should about the existence and effects of NTMs. Some of the difficulty is of a technical nature, as the Report carefully documents. The new Integrated Trade Intelligence Portal (I-TIP) information system being developed by the WTO Secretariat is an effort to increase transparency. But it is clear that governments bear a responsibility for the insufficiency of available information. A strong case exists for seeking improvements in the design and content of notification obligations and in the level of compliance with these obligations. This would seem to be a pre-condition for serious international engagement, whether regionally or multilaterally, in making progress on an agenda that promises significant gains to those who engage.



Pascal Lamy
Director-General

Executive summary

This year's *World Trade Report* ventures beyond tariffs to examine other policy measures that can affect trade. As tariffs have fallen in the years since the birth of the General Agreement on Tariffs and Trade (GATT) in 1948, attention has progressively shifted towards non-tariff measures (NTMs). The range of NTMs is vast, complex, driven by multiple policy motives, and ever-changing. Public policy objectives underlying NTMs have evolved. The drivers of change are many, including greater interdependency in a globalizing world, increased social awareness, and growing concerns regarding health, safety, and environmental quality. Many of these factors call for a deepening of integration, wresting attention away from more traditional and shallower forms of cooperation. Trade in services is a part of this development and has come under greater scrutiny, along with the policies that influence services trade.

The continuing multiplication of policy directions and preoccupations presents challenges for international cooperation. The GATT/WTO has addressed some of the challenges created by NTMs, both through its dispute settlement mechanism and successive rounds of GATT/WTO negotiations. The Tokyo and Uruguay rounds, in particular, focused on a number of NTMs, including standards, which were progressively subject to heightened multilateral discipline. The Uruguay Round also marked the inclusion of services in the WTO.

Regulatory measures such as technical barriers to trade (TBT) and sanitary and phytosanitary (SPS) measures in goods and domestic regulation in services raise new and pressing challenges for international cooperation in the 21st century. They also pose acute transparency issues. More than many other measures, they reflect public policy goals (such as ensuring health, safety and well-being of consumers). Their trade effects may be incidental, but they can also be designed and applied in a manner that unnecessarily frustrates trade. Moreover, they raise a number of issues that are specific to governments and firms in developing countries. The sheer breadth of the subject area has meant that the focus of this report is on TBT/SPS measures and domestic regulation in services.

A. Introduction

Section A of the Report presents an overview of the history of non-tariff measures in the GATT/WTO. This overview discusses how motivations for using NTMs have evolved, complicating this area of trade policy but not changing the core challenge of managing the relationship between public policy and trading opportunities.

Section B examines the reasons why governments use NTMs and services measures and the extent to which public policy interventions may also distort international trade. The phenomenon of offshoring and the cross-effects of services measures on goods trade are also considered. The section analyses choices among alternative policy instruments from a theoretical and empirical perspective. Finally, case studies are presented on the use of NTMs in particular contexts. These include the recent financial crisis, climate change policy and food safety concerns. The case studies consider how far measures adopted may pose a challenge for international trade.

Section C of the Report surveys available sources of information on NTMs and services measures and evaluates their relative strengths and weaknesses. It uses this information to establish a number of “stylized facts”, first about NTMs (TBT/SPS measures in particular) and then about services measures.

Section D discusses the magnitude and the trade effects of NTMs and services measures in general, before focusing on TBT/SPS measures and domestic regulation in services. It also examines how regulatory harmonization and/or mutual recognition of standards help to reduce the trade-hindering effects of the diversity of TBT and SPS measures and domestic regulation in services.

Section E looks at international cooperation on NTMs and services measures. The first part reviews the economic rationale for such cooperation and discusses the efficient design of rules on NTMs in a trade agreement. The second part looks at how cooperation has occurred on TBT/SPS measures and services regulation in the multilateral trading system, and within other international forums and institutions. The third part of the section deals with the legal analysis of the treatment of NTMs in the GATT/WTO dispute system and interpretations of the rules that have emerged in recent international trade disputes. The section concludes with a discussion of outstanding challenges and key policy implications of the Report.

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B. An economic perspective on the use of non-tariff measures

Reasons for government intervention and types of measures

Governments employ non-tariff measures to increase national welfare and for “political economy” reasons.

Non-tariff measures, such as TBT/SPS measures (including labelling), taxes and subsidies, are often the first-best policy instruments to achieve public policy objectives, including correcting market failures such as information asymmetries (where parties do not have the same information) or imperfect competition, and pursuing non-economic objectives, such as the protection of public health. NTMs such as export subsidies and export taxes increase national income by exploiting market power in international markets. While many NTMs are concerned with consumer protection, NTMs can also be utilized by political incumbents to protect domestic producers.

The use of NTMs, irrespective of the motive that underlies them, will often have trade effects.

In some cases, the use of NTMs can promote trade but in many other cases, they restrict it. In cases where the NTMs are meant to correct a market failure, the trade effects are an inadvertent by-product of pursuing a public policy objective. At other times, when NTMs are employed to manipulate the terms of trade or protect domestic producers, adverse trade effects on partners are the means through which gains are captured. The fact that the same NTM used to pursue a public policy objective can also be used for protectionist purposes underlines the difficulty of distinguishing between “legitimate” and protectionist motivations for NTMs, and of identifying instances where NTMs create unnecessary trade costs.

The choice of NTMs in light of domestic and international constraints

Analysing the choice among alternative instruments in light of the domestic political and economic context can help identify the motivation behind policy interventions.

Neither the declared aim of a policy nor its effect on trade provides conclusive evidence on whether or not an NTM is innocuous from a trade perspective. An analysis of the nature of these measures and of the political and economic conditions leading to their adoption can provide important insights in this regard. In particular, the opaque nature of certain NTMs compared with tariffs and other policy instruments allows politically motivated governments to conceal the true

costs and benefits of a measure and, thus, satisfy the demands of producer lobbies while maintaining the appearance of pursuing a policy of public interest. Various circumstances in the political environment, such as election cycles or inter-departmental conflicts, can give further indications as to why the use of NTMs persists. Sector characteristics also play a role. Pressure from large influential firms regarding increases in fixed costs or the prevalence of international offshoring in certain industries is bound to affect governments' decisions on the use of certain NTMs.

As countries make commitments in trade agreements that constrain their ability to pursue certain trade policies, less effectively regulated measures may emerge as a secondary means of protecting or supporting domestic industries.

When tariffs and other trade measures increasingly become unavailable to governments, certain NTMs, including behind-the-border NTMs such as TBT/SPS measures, may be used to influence trade. For example, a government may be tempted to impose more stringent domestic technical regulations if domestic firms in an import-competing industry find it easier than foreign companies to comply. Existing empirical evidence alludes to increased use of NTMs when tariffs are constrained by international agreements.

Measures affecting trade in services

Despite the peculiarities of services trade, distinguishing when services measures pursue public policy objectives from instances in which they distort trade is fraught with the same fundamental difficulties as in the case of NTMs.

The case for regulating services markets is particularly evident given the incidence of market failures in many services sectors. At the same time, the specific characteristics of services trade, notably the intangibility of services and the different modes of supply, imply that regulatory measures, mostly applied “behind the border”, are the only form of trade protection. Thus, while some services measures may be used explicitly for protectionist purposes, much services regulation pursues public policy objectives, but might nonetheless have effects on trade.

Ensuring that services measures do not unduly distort trade has become of even greater significance in light of the unbundling of production processes.

Trade in services plays an important role in supporting international production networks. Measures that restrict trade and competition in services markets may affect more than the sector directly concerned. Particularly in the case of infrastructural services, spillover effects on other services and goods can be significant.

NTMs in the 21st century

The use of NTMs in the financial crisis, and policies addressing climate change and food safety measures are all examples of how challenges arise at the interface of public policy and trade policy.

During the recent financial crisis, a number of “emergency” measures were taken to stem the spread of systemic damage. At the same time, it was feared that the crisis could increase the temptation to resort to beggar-thy-neighbour policies. This has heightened the need for the monitoring of measures taken in response to the crisis in order to guard against the spectre of protectionism.

In regard to climate change, countries with strict regimes will be tempted to resort to NTMs in order to manage the environmental and trade consequences of their climate policies. Two of these consequences are carbon leakage (whereby reductions of greenhouse gas emissions by a country with strict regulations are offset by increased emissions by a country with less strict regulations) and the loss in competitiveness of firms in countries with tough environmental regulations. While environmental reasons could motivate the use of NTMs, such as border adjustment measures, these measures also help competitively challenged domestic producers, giving rise to a risk of regulatory capture.

Economic, social and technological advances have resulted in higher consumer demand for food safety and posed new challenges in managing globally fragmented supply chains. Food safety measures have proliferated as a tool to respond to these challenges. As a consequence, various approaches to mitigate possible negative trade impacts, such as harmonization of standards, equivalence and commitment to a set of rules, are receiving widespread attention.

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C. An inventory of non-tariff measures and services measures

Sources of information on NTMs and services measures

Transparency is a major issue with regard to both NTMs and services measures. Despite recent efforts aimed at filling the information gap in this area, data remain sparse.

The relative scarcity of information on non-tariff measures is partly due to the nature of these measures, which are inherently more difficult to measure than tariffs. The WTO and other international organizations have undertaken substantial efforts and made good progress in classifying and collecting data on NTMs in recent years, and these efforts are starting to extend to services measures. However, more needs to be done to obtain a clearer and more complete picture of the trade policy landscape.

WTO internal sources include WTO members' schedules of concessions/commitments, notifications, WTO trade policy reviews, monitoring reports, and information on specific trade concerns (STCs) raised by WTO members and disputes brought to the WTO. Most of these sources suffer from limitations and fail to provide the level of transparency they are supposed to deliver. With WTO members' notifications, for example, the low compliance rate can be a serious limitation.

Another problem is the accessibility of data which are not always stored in databases and are scattered. The situation with regard to the accessibility of NTM data should improve considerably with the WTO's new Integrated Trade Intelligence Portal (I-TIP), which is currently being deployed.

With regard to non-WTO sources, it became evident by the early 2000s that UNCTAD's Trade Analysis and Information System (TRAINS) database, the most complete collection of publicly available information on NTMs, was in need of upgrading.

A multi-agency group including all relevant organizations updated UNCTAD's outdated coding system. At the same time, UNCTAD, the International Trade Centre and the World Bank started coordinating their efforts to collect official information on NTMs. They also undertook a series of business surveys that usefully complement official information.

Other non-WTO sources of NTM data include the Global Anti-Dumping Database, the CoRe NTMs Database and the Global Trade Alert Database.

None of these data sources provides comprehensive coverage of NTMs. However, each sheds light on a

particular aspect, and taken together they provide significant information.

Besides the specific commitments under the General Agreement on Trade in Services and preferential trade agreements, there is very little information on services measures. The OECD's Product Market Regulation family of indicators is the main source of information on applied measures. However, it does not distinguish between market access and national treatment limitations on the one hand and domestic regulation on the other. The most reliable information on domestic regulation comes from sector-specific data, for example in financial services.

Stylized facts about NTMs

Despite common perceptions about a rising trend in NTMs, evidence is inconclusive. NTMs appear to have risen in the mid-1990s, but between 2000 and 2008 activity remained relatively flat before picking up again following the financial crisis. However, WTO notifications suggest an upward trend in TBT/SPS measures.

According to historical data from the UNCTAD TRAINS database, shares of product lines and trade values covered by NTMs rose between the late 1990s and early 2000s, but then stayed flat or declined slightly up to 2008.

WTO data on notifications, however, show increasing use of TBT/SPS measures since the mid-1990s. This increase in the incidence of TBT/SPS measures is reflected in an increase in the number of specific trade concerns raised by WTO members in the TBT and SPS committees. Frequency and coverage ratios for specific trade concerns have also risen over time, although not evenly.

Evidence from WTO disputes in relation to TBT and SPS measures is more nuanced. Over the last five years, only 11 per cent of disputes cited the SPS Agreement and 12 per cent cited the TBT Agreement. The General Agreement on Tariffs and Trade (GATT) was cited more than half of the time (55 per cent) during the same period. One possible explanation for this discrepancy is that other committee-based cooperation mechanisms are effective in diffusing conflicts.

TBT/SPS measures are the most frequently encountered NTMs according to data collected from official sources. They are also considered among the most relevant impediments to exports, according to business surveys.

Newly collected official NTM information from 30 developing countries, the European Union and Japan shows a high cross-sectional incidence of TBT and SPS measures.

Evidence from business surveys conducted by the ITC in 11 developing countries suggests that TBT/SPS measures are the most burdensome for exporters. In 2010, the share of TBT/SPS measures in all NTMs perceived burdensome by exporting firms was 48 per cent. Similarly, survey-based data show a large share of TBT/SPS in measures affecting EU exporters (just over 50 per cent), but the US share is lower (around 20 per cent). This discrepancy might be explained by differences in methodology between the US and EU surveys.

Evidence from WTO members' specific trade concerns and ITC business surveys indicates that TBT/SPS measures applied by developed countries are an important source of concern.

TBT/SPS measures imposed by developed economies raise relatively more specific trade concerns than measures imposed by developing economies. The ITC business surveys show a greater resort to TBT/SPS measures by developed economies.

NTMs, and TBT/SPS measures in particular, vary across sectors but are especially prevalent in agriculture.

Specific trade concerns related to SPS measures overwhelmingly affect the agricultural sector (94 per cent), which is far from surprising. More unexpected is the fact that a large number of TBT concerns (29 per cent) also relate to agriculture. Additionally, econometric analysis shows that TBTs as measured by specific trade concerns are most important, in terms of numbers of tariff lines and trade value, in the agricultural sector.

If ITC survey responses are weighted by trade, the reported incidence of NTMs among firms in the agricultural sector is 63 per cent, compared with 45 per cent in manufacturing. Furthermore, TBT/SPS measures are far more prevalent among NTMs in agriculture (59 per cent) than in manufacturing (34 per cent).

Evidence from WTO disputes also shows a greater number of citations of the SPS and TBT agreements in cases involving agricultural products. Both agreements were cited in 28 per cent of disputes involving agricultural products (as defined in the Agreement on Agriculture) between 2007 and 2011. Meanwhile, no disputes involving non-agricultural products cited the SPS Agreement and only 2.9 per cent cited the TBT Agreement.

Evidence also suggests that procedural obstacles are the main source of difficulties for exporting firms from developing countries.

ITC business surveys show that, for exporters, more than 70 per cent of burdensome NTMs also raise a

procedural obstacle. Time constraints and unusually high fees or “informal” payments together account for more than half of reported obstacles.

Services measures

The currently available sources of information on services measures are unsatisfactory in a number of respects. WTO notifications suffer from low compliance rates. WTO members’ schedules of market access and national treatment commitments provide information on bound policies but the regimes actually applied are often more open. Domestic regulation is generally measured using poor proxies.

Product Market Regulation (PMR) indicators, the most frequently used data on services measures, have followed a downward trend in OECD countries since the late 1990s. This indicates an increase in market contestability, but provides limited information on trends of market access, national treatment and domestic regulation. Very little is known on the trends in services measures in most non-OECD countries because they are not included in the PMR.

There is some evidence of discrimination against foreign services and services providers, in particular from the foreign direct investment (FDI) restrictiveness index calculated by the OECD. Such discrimination, which is likely to generate rents for domestic incumbents, has however followed a downward trend since the late 1990s, especially via reductions in foreign equity restrictions.

As far as domestic regulation is concerned, the data situation is particularly troubling. The trade literature has used PMR indicators to proxy for domestic regulation, but such indicators do not provide a satisfactory account of qualification requirements and procedures and technical standards in services. One of the difficulties in measuring domestic regulation is that it is often sector-specific. Not surprisingly, the most reliable information comes from sector-specific datasets, such as the World Bank dataset on banking regulation.

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D. The trade effects of non-tariff measures and services measures

The quantification of trade effects

Non-tariff measures are diverse and cannot easily be compared across countries and sectors. The existing literature, however, suggests that NTMs significantly distort trade, perhaps even more than tariffs. Moreover, the relative contribution of NTMs to the overall level of protection appears to increase with the level of GDP per capita.

A number of studies quantify the effect of NTMs on international trade by estimating an “ad-valorem tariff equivalent” (AVE). Averaging across countries and across tariff lines, NTMs almost double the level of trade restrictiveness imposed by tariffs. More recent evidence suggests that with falling tariffs, the contribution of NTMs to overall trade restrictiveness is likely to have increased even more. The evidence also suggests that as WTO members become richer, the trade restrictiveness of NTMs – relative to tariffs – increases. Furthermore, the average AVE for agricultural products appears to be much higher than that for manufactured goods.

The degree of restrictiveness of services measures is generally higher in developing countries than in developed countries. Yet there is no systematic relationship between the restrictiveness of services measures and income per capita.

The restrictiveness of services measures does not appear to be systematically associated with a country’s level of development because there is much variation within the group of developing economies. Furthermore, it appears that the cross-country variation in the restrictiveness of services measures may depend on the particular service sector under consideration.

The methods developed in the trade literature to estimate the degree of restrictiveness of NTMs and services measures suffer from a number of limitations. These are aggravated in the presence of global supply chains.

The methodological limitations can be traced, in part, to a lack of transparency in the use of NTMs and services measures. Problems also arise due to insufficient data on different prices, the sensitivity of results from the use of different econometric techniques and the difficulty of attributing price increases to a single measure when a market is characterized by multiple NTMs and services measures.

Efforts so far to measure the trade effects of NTMs and services measures do not address the fact that in a global supply chain semi-finished goods have to

move across international borders more than once. The effect of a marginal increase in trade costs is much larger than would be the case if there were a single international transaction.

Estimates of the restrictiveness of services measures do not account for their impact on trade in goods.

The trade-restrictive impact of services measures goes beyond trade in services and spills over to trade in goods. Transport and travel account for about half of cross-border trade in services and are obviously the most important direct services inputs to international trade. There is evidence that barriers to trade and competition in transport and logistics have a negative impact not only on cross-border trade in transport services, but also on a country's overall trade performance. Similarly, regulatory barriers to FDI flows and business services are shown to affect export performance in manufacturing sectors such as machinery, motor vehicles, chemicals and electric equipment.

The complementarities between goods and services and the spill-over effects of services measures on merchandise trade are especially strong along global value chains. Open and competitive business services markets are essential for moving up the value chain into more differentiated and service-intensive manufactured goods.

Estimates of the overall restrictiveness of services measures should take interactions between trade in services and trade in goods into account, but empirical analysis on this is still scarce.

A focus on TBT/SPS measures and domestic regulation in services

A comparative analysis of the role that the various types of NTMs play in the overall level of NTM restrictiveness does not exist. However, the impact on trade is not necessarily restrictive for all measures. TBT/SPS measures and domestic regulation in services, in particular, do not unambiguously increase or decrease trade.

In general, TBT/SPS measures have prevalently positive effects for more technologically advanced sectors, but negative effects on trade in fresh and processed goods. Furthermore, when negative, the effect of TBT/SPS measures on trade is found to be driven by the impact on developing countries' exports, especially small countries.

Empirical evidence on the trade effect of domestic regulation in services is extremely limited. Domestic regulation that reduces competition negatively affects bilateral trade. In contrast, evidence from the financial

sector shows that domestic regulation aimed at ensuring appropriate standards has a positive effect on trade.

TBT/SPS measures and domestic regulation in services affect not only how much two countries trade but also the number of countries with whom they trade.

It has been argued that TBT/SPS measures may mainly represent a fixed cost to enter a new market. For example, a firm may need to pay an initial cost of adaptation to the standard in a foreign market that it enters, but this cost is independent of the amount the firm sells. This is consistent with evidence that TBT/SPS measures have a stronger effect on small rather than large firms, and on firms that outsource their components.

The importance of the fixed cost component also is consistent with the evidence that TBT/SPS measures and domestic regulation in services affect trade both through their impact on the volume of trade between two countries, and through their effect on the diversification of export markets.

There is some evidence that conformity assessment is particularly burdensome.

A study on SPS measures conducted for this report finds that conformity assessment measures have a stronger negative impact on food and agriculture trade relative to regulations on product characteristics.

Negative effects on trade are mitigated by a reduction in policy divergence, whether through convergence to international standards, harmonization or mutual recognition.

The empirical literature measures the extent of harmonization of TBT/SPS measures in different ways. For example, some studies consider a standard to be harmonized if it conforms to an international standard published by the International Organization for Standardization (ISO), the International Electrotechnical Commission (IEC), the International Telecommunication Union (ITU) or similar bodies. Other studies treat standards as harmonized if they are common to a group of countries. Notwithstanding these differences, a general finding in the literature is that harmonization of TBT/SPS measures increases trade. In particular, harmonization of TBT/SPS measures is shown to enhance the presence of small and medium-sized firms in export markets.

As with goods, it has been argued that differences in services regulation across countries (policy heterogeneity) constitute regulatory trade restrictions. There is indeed evidence that a reduction in policy heterogeneity, carried out through mutual recognition of standards or convergence to international standards, has led to increased services trade.

If harmonization and mutual recognition of standards occur at the regional level, there may be significant trade-diverting effects on outsiders and regulatory “lock-in”. This appears to be the case especially for developing countries.

Existing studies indicate that harmonization at the regional level tends to divert trade. Such trade diversion negatively affects developing countries' exports in particular. The inclusion of specific provisions in preferential trade agreements appears to follow a “hub and spoke” structure, with a larger partner representing the hub to whose standards the spokes will conform.

As discussed in last year's *World Trade Report*, the risk of a lock-in effect exists in regional provisions on TBTs. Harmonization to a regional standard may increase the costs for further multilateral trade opening. If adopting a certain standard involves the payment of some form of fixed cost, the risk exists that regional provisions may work as a stumbling block in multilateral cooperation.

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E. International cooperation on non-tariff measures in a globalized world

Regulation of NTMs in trade agreements

Shallow agreements contain provisions that focus on addressing the problem of tariffs being replaced by non-tariff measures.

Under the main economic theory for trade agreements, the main problem that the rules on non-tariff measures in a trade agreement need to address is “policy substitution” between tariffs and non-tariff measures. Efficiency can be obtained with a simple set of rules, which leave substantial autonomy to national governments in setting NTMs (“shallow” integration).

The changing nature of international trade and the use of private standards may prompt the need for deeper forms of institutional integration.

The proliferation of global production chains creates new forms of cross-border policy spillovers. In addition, firms increasingly employ private standards to address the challenges in governing their supply chains, with implications for market access. This provides a rationale for deep cooperation on NTMs within trade agreements. Because production is international, some of the costs of trade frictions are borne by firms in foreign states. Trade agreements play a role in preventing governments and firms from distorting trade and investment decisions across the supply chain.

Moreover, the growing number of reasons why governments resort to NTMs, including for health, safety and environmental considerations, creates a need to develop rules to facilitate cooperation in the identification of efficient and legitimate uses of NTMs.

As consumer concerns become more important in areas such as health and the environment, regulations play a more prominent role in government decisions for legitimate reasons. However, the complexity of certain NTMs can create inefficiencies because policy-makers may not have all the necessary information about their own regulatory needs and the needs of their trading partners. The opacity of many NTMs also makes enforcement of regulations a difficult international endeavour, because it depends on the ability of each government to observe how the others are holding up their end of the bargain.

GATT rules regarding national treatment and non-violation complaints were designed to address the policy substitution problem between tariffs and NTMs. Deep agreements regulate NTMs in different ways, creating trade-offs.

One of the principal constraints on discrimination via NTMs is the obligation to treat foreign products at least as favourably as “like” domestic products (national treatment). When a measure does not explicitly violate national treatment rules, governments may instead appeal to so called “non-violation” complaints that are allowed if one government can show that it has been deprived of an expected benefit because of another government’s action. In practice, however, non-violation complaints have been resorted to rarely by WTO members in disputes and where such complaints have been put forward, they often have not prospered.

Three forms of deep integration are often discussed: mutual recognition of regulations, linking tariff and non-tariff measures in trade negotiations, and harmonization of NTMs. These approaches imply trade-offs that depend on a number of economic conditions (e.g. the extent of trade integration, differences in policy preferences across countries) that need to be clearly assessed.

Cooperation in specific policy areas: TBT/SPS measures, services measures

Countries cooperate on TBT/SPS measures to address problems that arise when balancing trade restrictiveness and the achievement of policy objectives.

Problems may arise when governments try to balance trade restrictiveness and the achievement of policy objectives through efficient regulations. To address these problems, countries cooperate by developing, disseminating, and adopting common approaches to regulation, such as “good regulatory practices”, and by developing international standards as benchmarks for measures.

The WTO’s TBT and SPS committees also allow WTO members to address problems regarding lack of information. Transparency procedures developed by the committees for the “notification” by WTO members of draft measures have enhanced the quality and availability of information on measures. Discussions of specific trade concerns provide information about how other members are balancing trade restrictiveness and the achievement of policy objectives.

WTO members cooperate through the GATS by subjecting certain types of services measures to negotiations on progressive trade opening.

Trade protection in services can be found in internal law, regulations, rules, procedures, decisions, administrative actions and suchlike. Although such services measures often do not primarily have a trade-related focus, there may be cases where regulations have unnecessarily trade-distortive and restrictive effects.

The GATS provides a framework for distinguishing between those regulations which can be considered as barriers to trade in services, and thus subject to progressive trade opening, and other measures which are domestic regulation. Discriminatory regulation, which violates national treatment, and quantitative restrictions on market access are already disciplined by the GATS and their removal is the subject of negotiations.

WTO members face the challenge of negotiating disciplines on domestic regulation to complement market access commitments.

Some domestic regulations are outside the scope of market access negotiations, but nevertheless have an impact on trade. The challenge is to find ways to ensure that they fulfil their stated objectives in a manner which is not more burdensome than necessary.

Thus, the focus of work in the GATS has been on negotiating a set of disciplines on domestic regulation to ensure that these measures are based on transparent and objective criteria, are not more burdensome than necessary to ensure the quality of the service and, in the case of licensing procedures, are not in themselves a restriction on the supply of services. The experience of the SPS and TBT agreements points towards the need for a similar set of disciplines in services to eliminate or reduce requirements which are not necessary for the objective sought.

GATT/WTO disciplines on NTMs as interpreted in WTO dispute settlement

GATT rules on NTMs are consistent with a “shallow integration” approach.

The GATT does not constrain the regulatory autonomy of WTO members except where a measure treats an imported product less favourably than a “like” domestic product (Article III: national treatment), discriminates between two like imported products (Article I: most-favoured nation), or constitutes a border prohibition or restriction that has a limiting effect on the quantity or amount of a product being imported or exported (Article XI). This framework is supplemented by the possibility that challenges may be brought against GATT-consistent measures that nullified or impaired benefits accruing to a trading partner.

However, even where an NTM is inconsistent with the non-discrimination obligations of Articles I and III, or the prohibition on quantitative restrictions in Article XI, it may be justified under one of the general exceptions of GATT Article XX.

Different approaches have been advocated to the question of whether NTMs that pursue a legitimate regulatory objective should be found to violate the non-discrimination obligations in the GATT and the other WTO agreements.

Some consider that the national treatment obligation in Article III should be interpreted strictly to allow for NTMs that, despite being discriminatory, pursue a legitimate regulatory purpose or can objectively be said not to have a protectionist intent. For others, such considerations are not appropriate in the analysis under Article III, but rather belong in the assessment of whether the measure concerned can be justified under one of the general exceptions of Article XX of the GATT.

The role of regulatory purpose for the analysis under Article 2.1 of the TBT Agreement was recently clarified by the Appellate Body in two recent disputes (*US – Clove Cigarettes* and *US – Tuna II (Mexico)*). The Appellate Body held that to run afoul of Article 2.1 of the TBT Agreement, the technical regulation must not only have a detrimental impact on the competitive opportunities of the imported product, but also such detrimental impact must not stem exclusively from a legitimate regulatory distinction. In interpreting Article 2.1, the Appellate Body noted that while the GATT and the TBT Agreement seek to strike a similar balance, the two agreements are structured differently. In the GATT the balance is expressed by the national treatment rule in Article III:4 as qualified by the exceptions in Article XX, whereas in the TBT Agreement the balance is to be found in Article 2.1 itself.

The SPS and TBT agreements are “post-discriminatory” agreements.

Although the SPS and TBT agreements include non-discrimination obligations, they contain provisions that go beyond a “shallow integration” approach. They promote harmonization through the use of international standards and include obligations that are additional to the non-discrimination obligation. This includes, for instance, the need to ensure that requirements are not unnecessarily trade restrictive. Some question the appropriateness of these “post-discriminatory” obligations, arguing that the assessment of a measure’s consistency with such requirements is difficult without WTO adjudicators “second-guessing” a member’s domestic regulatory choices.

Challenges in dealing with non-tariff measures

Recent changes in the global economic environment have altered both the perceived need for NTMs and the structure of government incentives to use these measures for protectionist purposes.

The rules of the GATT were designed for a world of trade in final goods, but the growing complexity of

production networks across borders is altering the nature of modern international trade. These changes pose challenges for governance, as the kinds of problems that arise in a world of offshoring require some rethinking about the current market access based framework of the multilateral trading system.

Changes in international markets do not only arise from differences in how businesses organize, but also from a number of other issues, including the growing sensitivity of consumers and voters to health and climate concerns. On the other hand, it is also likely that the use of NTMs will be responsive to a number of foreseeable trends in the global economic environment, including the way food is produced and consumed, the central role of international finance in the economy and in economic crises, and the fundamental challenges of climate change.

Transparency provisions in the WTO agreements help address the problems raised by the opacity of NTMs but they are not sufficient. This is, at least in part, because, contrary to what is often claimed, not everyone benefits from transparency.

While every government is interested in its partners’ NTMs, it may be reluctant to disclose information on its own NTMs. The WTO’s Trade Policy Review Mechanism and its monitoring reports help to address this problem, but resources and the timeframe between reports limit their usefulness.

Increasing transparency, in effect, opens trade. This means that for governments, the incentives to maintain opacity are similar to those for imposing a tariff. Despite common rhetoric endorsing transparency, the distributional impact of transparency provisions is typically ignored in a manner incompatible with economic incentives.

Among the options to improve transparency are providing the WTO with the resources necessary to independently monitor governments and markets, or relying on some third party to do the same. Compliance would still be an issue, as delegation of this monitoring role does not eliminate the lack of incentive for governments to be transparent. Members may need bilateral and/or plurilateral negotiations over transparency obligations in order to improve the situation.

Limiting the protectionist application of NTMs requires better integration of economic and legal analysis. Economic theory can help in identifying situations in which governments may be more likely to employ NTMs for competitiveness reasons rather than the stated public policy rationale.

When there is a legal dispute as to the importance of the purpose, rationale, or intent of a measure,

economic theory could provide insight into a government's choice of a measure, as well as the way it is administered. NTMs can be evaluated using economic reasoning to assess their suitability in addressing various public policy concerns. Government policy could also be screened for evidence of protectionism.

While the use of "economic indicators" is certainly neither exhaustive nor able to provide a conclusive answer as to the true policy rationale of an NTM affecting foreign trade interests, it may nevertheless be the case that this type of analysis could usefully be employed to narrow evidentiary gaps that may arise in the examination of certain trade rules.

While current WTO rules focus on the policy substitution problem between tariffs and NTMs, policy flexibility is in some cases too limited.

A non-violation approach to complaints could play a role in allowing WTO members to retaliate against other members' use of NTMs to circumvent their obligations – the so-called "policy substitution" problem. However, when a member wishes to choose a domestic measure that lowers restrictions to trade, the rules do not allow members to raise their tariffs to maintain their committed level of market access. This lack of flexibility may discourage the adoption of efficient domestic regulations or even trade concessions. Therefore, broadening the scope of non-violation complaints may improve economic efficiency.

On the legal side, there remain a number of ambiguities concerning the elements that a complainant must satisfy for its claim of non-violation to succeed. WTO members have preferred to address NTMs and domestic regulation in services using other rules. Finally, even if there were a successful case, the remedy available when a non-violation complaint is successful is weaker than the remedies available in cases of violation.

Strong encouragement in the SPS and TBT agreements to follow international standards creates tension in practice.

The SPS and TBT agreements encourage the use of international standards. There is, however, a "line of tension" between, on the one hand, reliance on international standards as a way to avoid unnecessarily trade-restrictive measures, and, on the other hand, deploying a "relevant" international standard. International standards may be difficult to use and there may be differences in preferences among WTO members, and difficulties in setting international standards, including differing capacities to influence the desired outcomes. The regular work of the TBT and SPS committees and certain aspects of on-going negotiations in the Doha Round are affected by this tension.

The responsibility of governments with respect to private standards and the role of the WTO are not clear.

The role of the WTO in addressing the trade impact of "private standards" is another important challenge facing the multilateral trading system. This topic arises across the WTO's regular work in contexts as diverse as green protectionism, food safety and social responsibility. Although these standards are cast as "voluntary" in nature (because they are imposed by private entities), they may nevertheless have significant *de facto* impacts on trade, and this has been of particular concern to developing countries in the WTO. Considering that private standards are non-governmental by definition, this gives rise to questions regarding the responsibility of governments with respect to private standards (under WTO disciplines), as well as the role of the WTO itself. While some members see no place for this discussion in the WTO, others are keen to engage.

It is vital to ensure that market access and national treatment commitments in the GATS are not impaired by unduly burdensome or protectionist practices.

The principal concern is that common rules at the multilateral level will result in a loss of regulatory freedom to pursue non-trade objectives for services. One way to overcome concerns regarding regulatory autonomy would be to focus the discipline on the necessity of the measure used to achieve its stated purpose. Another would be to foster greater awareness of the trade and investment implications of regulatory practices.

It is important to identify possible areas where trade instruments for pro-competitive regulation of services could be used.

The WTO has the experience of successfully developing a text that supports competition in the telecoms sector. Such experience could be used in other sectors where there might be potential for the use of similar instruments. Identifying possible areas for the use of trade instruments for pro-competitive regulation would require action by a wide range of national, regional and international agencies in order to expand regulatory dialogue and cooperation.

Capacity building is a vital part of improving international cooperation both on TBT/SPS measures and on domestic regulation in services.

Regulations aimed at dealing with public policy are not subject to market-opening negotiations in the same way as protectionist trade barriers, and therefore there is no place for thinking about preferential arrangements, such as the Generalized System of Preferences, to assist developing countries to develop and grow.

Instead, the developmental challenge associated with trade-friendly public policy involves technical assistance and capacity-building. In the area of SPS and TBT, developing and least-developed countries often lack the regulatory institutions, the training capacity, and physical infrastructure that would enable them to design and implement effective measures in these areas.

The Standards and Trade Development Facility (STDF), a global partnership established by the Food and Agriculture Organization of the United Nations (FAO), the World Organization for Animal Health (OIE), the World Bank, the World Health Organization (WHO) and the WTO, supports capacity building efforts in the SPS area. The Enhanced Integrated Framework and the Aid for Trade Initiative are also relevant here.

Addressing regulatory challenges in trade in services requires doing more than curbing non-transparent or unduly restrictive regulatory practices. Despite over a decade of negotiations, much remains to be done to improve cooperation and awareness among regulators, policy-makers and trade negotiators of the links between regulatory issues and trade principles. Sharing knowledge on good practices and strengthening regulatory institutions are important priorities for the proper functioning of services markets.

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I. World trade in 2011

World trade growth decelerated sharply in 2011 as the global economy struggled under the influence of natural disasters, financial uncertainty and civil conflict. A slowdown in trade had been expected after the strong rebound of 2010 but the earthquake in Japan and flooding in Thailand shook global supply chains, and fears of sovereign default in the euro area weighed heavily in the closing months of the year. The civil war in Libya also reduced oil supplies and contributed to sharply higher prices. All of these factors combined to produce below average growth in trade in 2011.

A. Introduction

The volume of world merchandise trade rose 5.0 per cent in 2011, accompanied by global output growth of 2.4 per cent. This marked a significant slowdown from 2010, when trade advanced 13.8 per cent and output expanded by 3.8 per cent (see Figure 1.1).¹

Slower growth in both trade and output had been anticipated for 2011, but multiple economic shocks held back economic activity and trade during the year. The earthquake, tsunami and nuclear incident that hit Japan in March sharply depressed the country's exports in the second quarter, while flooding in Thailand reduced the supply of key parts and components in the fourth quarter and further distorted global production networks. Turmoil in North African countries took a toll on the region's exports, especially in Libya, where oil production and exports plunged. Finally, negative gross domestic product (GDP) growth in the European Union reduced demand for imported goods in the fourth quarter as the euro sovereign debt crisis came to a head.

The sluggish pace of economic growth in 2011 reduced import demand in the largest economies and resulted in global export growth below the WTO's forecast of 5.8 per cent. Japan's output contracted in the fourth quarter after recording just one-quarter of expansion on the year in the third quarter. Even China's dynamic economy appeared to be slowing towards the end of the year as its fourth quarter GDP growth slipped to an annualized rate of 7.8 per cent after averaging around 9.5 per cent over the first three quarters, according to data from China's National Bureau of Statistics. Economic indicators improved in the United States in the closing months of 2011 as output growth accelerated to 3.0 per cent annualized in the fourth

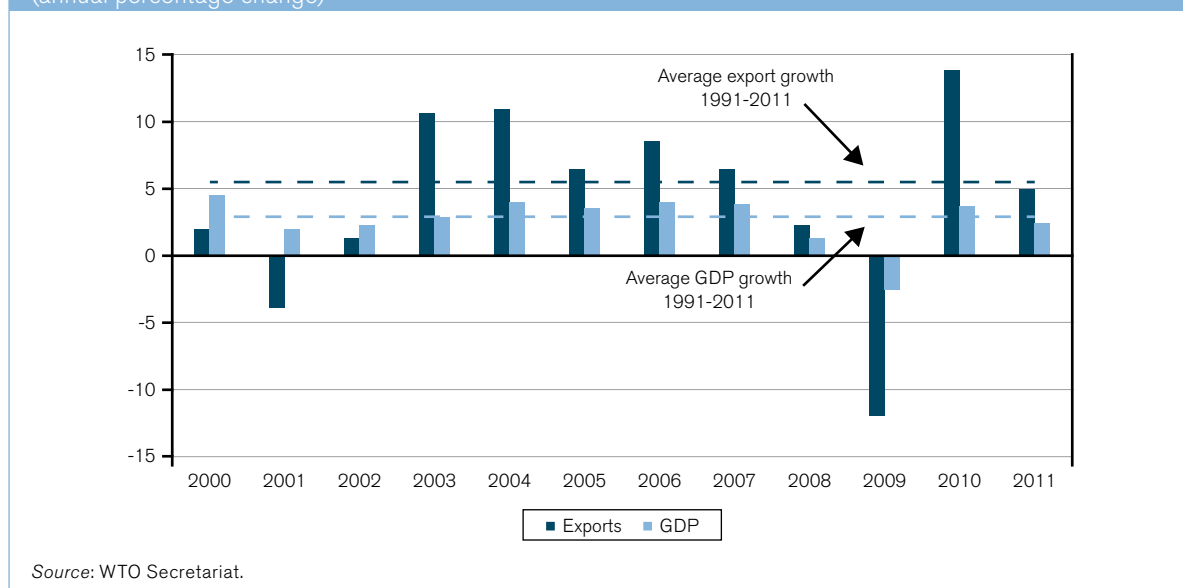
quarter and unemployment fell to 8.3 per cent in December according to data from the OECD, but this only partly made up for earlier setbacks.

Developed economies exceeded expectations with export growth of 4.7 per cent in 2011 while developing economies (for the purposes of the analysis, this includes the Commonwealth of Independent States, or CIS) did worse than expected, recording an increase of just 5.4 per cent. In fact, shipments from developing economies other than China grew at a slightly slower pace than exports from developed economies (including disaster-struck Japan). The relatively strong performance of developed economies was driven by a robust 7.2 per cent increase in exports from the United States, as well as a 5.0 per cent expansion in exports from the European Union. Meanwhile, Japan's 0.5 per cent drop in exports detracted from the average for developed economies overall.

Several adverse developments disproportionately affected developing economies, including the interruption of oil supplies from Libya that caused African exports to tumble 8 per cent in 2011, and the severe flooding that hit Thailand in the fourth quarter. The Japanese earthquake and tsunami also disrupted global supply chains, which penalized exports from developing countries such as China, as reduced shipments of components hindered production of goods for export (see quarterly volume developments for selected economies in Appendix Figure 1).

Significant exchange rate fluctuations occurred during 2011, which shifted the competitive positions of some major traders and prompted policy responses (e.g. in Switzerland and Brazil). Fluctuations were driven in

Figure 1.1: Growth in volume of world merchandise trade and GDP, 2000-11
(annual percentage change)



large part by attitudes towards risk related to the euro sovereign debt crisis. The value of the US dollar fell 4.6 per cent in nominal terms against a broad basket of currencies according to data from the Federal Reserve, and 4.9 per cent in real terms according to data from the International Monetary Fund, making US goods generally less expensive for export. Nominal US dollar depreciation also would have inflated the dollar values of some international transactions.

The developments outlined above refer to trade in real (i.e. volume) terms, but nominal flows (i.e. in currency terms) for both merchandise and commercial services were similarly affected by recent economic shocks.

In 2011, the dollar value of world merchandise trade advanced 19 per cent to US\$ 18.2 trillion, surpassing the previous peak of US\$ 16.1 trillion in 2008. Much of the growth was due to higher commodity prices, but monthly trade flows were mostly flat or declining in many major traders over the course of the year (see monthly nominal developments in Appendix Figure 2).

The share of developing economies and the CIS in the world total also rose to 47 per cent on the export side and 42 per cent on the import side, the highest levels ever recorded in a data series extending back to 1948.

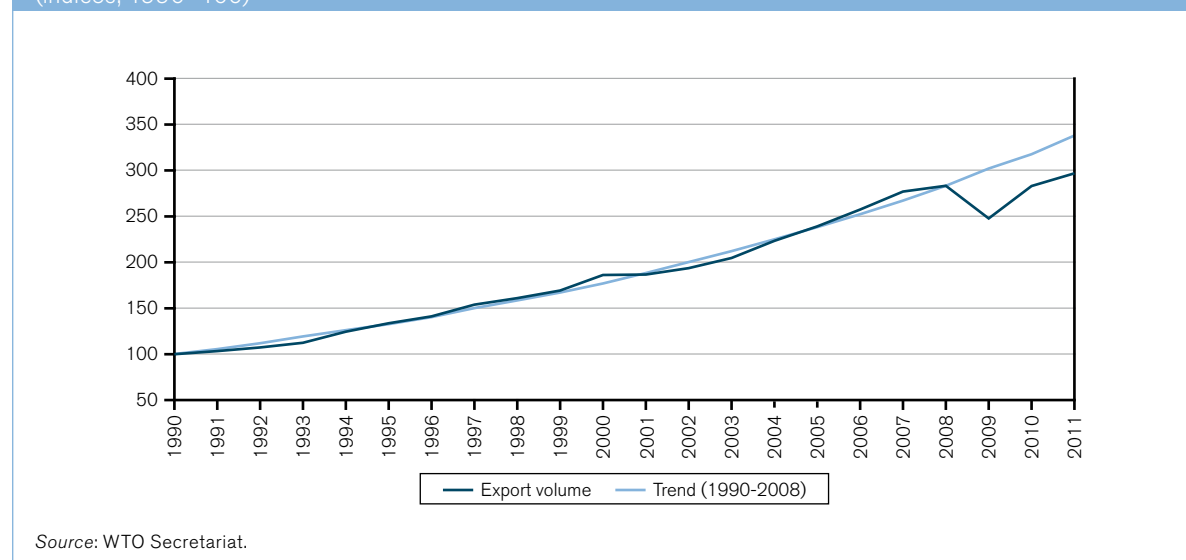
The value of world commercial services exports increased by 11 per cent in 2011 to US\$ 4.2 trillion, with strong differences in annual growth rates for

particular countries and regions. African exports were hit hard by the turmoil in Arab countries, recording zero growth as Egypt's exports of travel services plunged more than 30 per cent. Quarterly data on services jointly prepared by the WTO and the United Nations Conference on Trade and Development (UNCTAD) also showed a sharp slowdown in the fourth quarter, coinciding with the heightened level of financial market turmoil surrounding the euro debt crisis.

The 5.0 per cent growth of world merchandise trade in 2011 was below the pre-crisis average of 6.0 per cent for 1990–2008, and was even below the average of the last 20 years, including the period of the trade collapse (5.4 per cent). As a result, trade volume of world trade was even further away from its pre-crisis trend at the end of 2011 than it was a year earlier. In fact, this gap should continue to increase as long as the rate of trade expansion falls short of earlier levels (see Figure 1.2).

Eliminating this divergence would require faster than average growth at some point in the future. Conceivably, this could happen after governments, businesses and households in developed countries reduce their debt burdens to more manageable levels, but this process of deleveraging (reducing reliance on debt) and fiscal consolidation (reducing budget deficits) is likely to take years. In the meantime, the world may have to resign itself to a long period of slower-than-average growth in international trade.

Figure 1.2: Volume of world merchandise exports, 1990–2011 (indices, 1990=100)



Endnote

- Note that merchandise trade volume figures refer to growth in real terms, i.e. adjusted to account for changes in the prices of exports and imports.

B. State of the world economy and trade in 2011

1. Economic growth

The rate of world output growth fell to 2.4 per cent in 2011 from 3.8 per cent in the previous year, weighed down by the on-going sovereign debt crisis in Europe, supply chain disruptions from natural disasters in Japan and Thailand, and turmoil in Arab countries. This pace of expansion was well below the 3.2 per cent average over the 20 years leading up to the financial crisis in 2008 (see Table 1.1).

Japan's 0.5 per cent contraction in output, brought on by the catastrophic earthquake in March 2011, contributed to the lacklustre 1.5 per cent growth of developed economies in 2011. Growth of GDP (total production in the country) in the United States was slightly faster than the average of all developed economies at 1.7 per cent, while the EU's rate was in line with the average at 1.5 per cent.

The fastest growing regions were the Middle East at 4.9 per cent, followed by the Commonwealth of Independent States at 4.6 per cent and South and Central America at 4.5 per cent. Africa, with GDP growth of 2.3 per cent, might have grown even faster if

not for the uprisings that occurred in Libya, Tunisia, Egypt and elsewhere.

Once again, China's GDP growth outpaced the rest of the world at 9.2 per cent, but this rate was no better than what the country achieved at the peak of the global financial crisis in 2009. In contrast to this performance, the newly industrialized economies of Hong Kong, China, of the Republic of Korea, of Singapore and of Chinese Taipei together grew at less than half the rate of China (4.2 per cent). Developing economies and the CIS together recorded a 5.7 per cent increase in 2011.

Aggregate quarterly figures for world GDP growth are not readily available, but such growth likely slowed towards the end of 2011 in the face of headwinds from the European sovereign debt crisis. Output of the euro area contracted at a 1.3 per cent annual rate in the fourth quarter, marking the first quarter of negative growth since the currency bloc emerged from recession in 2009 (see Figure 1.3). At the same time, China's economy slowed and Japan remained mired in recession. Growth picked up in the United States in the fourth quarter as unemployment eased, but this was likely outweighed by developments elsewhere.

Table 1.1: GDP and merchandise trade by region, 2009-11
(annual percentage change)

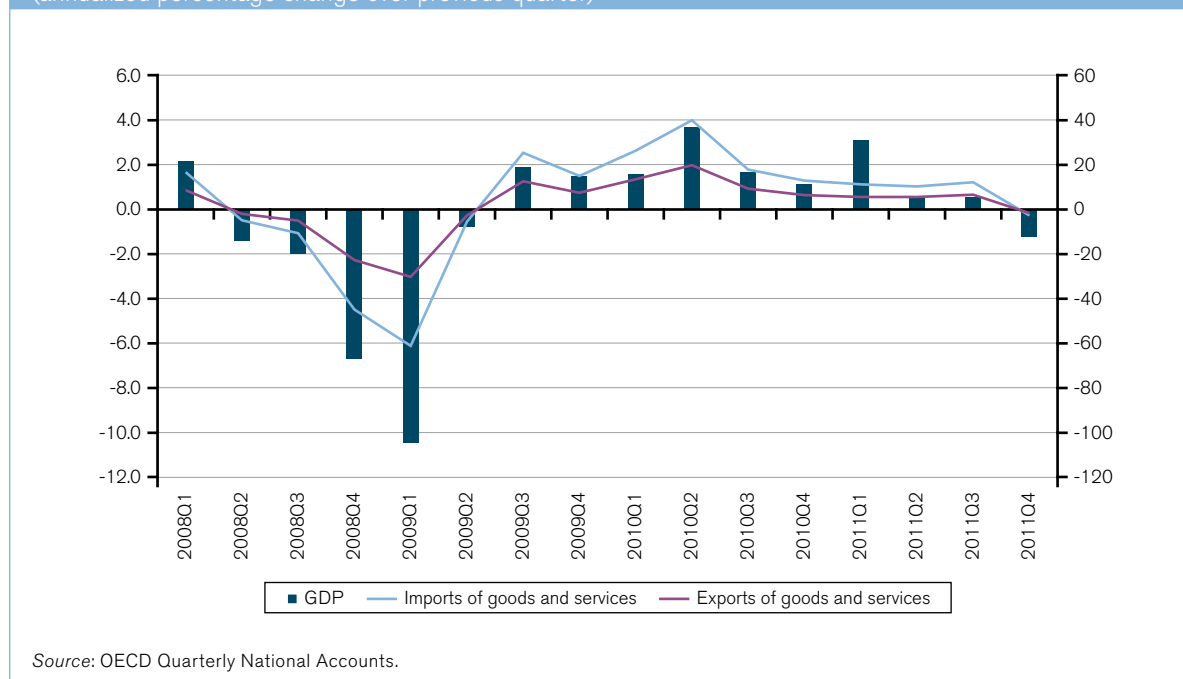
	GDP			Exports			Imports		
	2009	2010	2011	2009	2010	2011	2009	2010	2011
World	-2.6	3.8	2.4	-12.0	13.8	5.0	-12.9	13.7	4.9
North America	-3.6	3.2	1.9	-14.8	14.9	6.2	-16.6	15.7	4.7
United States	-3.5	3.0	1.7	-14.0	15.4	7.2	-16.4	14.8	3.7
South and Central America^a	-0.3	6.1	4.5	-8.1	5.6	5.3	-16.5	22.9	10.4
Europe	-4.1	2.2	1.7	-14.1	10.9	5.0	-14.1	9.7	2.4
European Union (27)	-4.3	2.1	1.5	-14.5	11.5	5.2	-14.1	9.5	2.0
Commonwealth of Independent States (CIS)	-6.9	4.7	4.6	-4.8	6.0	1.8	-28.0	18.6	16.7
Africa	2.2	4.6	2.3	-3.7	3.0	-8.3	-5.1	7.3	5.0
Middle East	1.0	4.5	4.9	-4.6	6.5	5.4	-7.7	7.5	5.3
Asia	-0.1	6.4	3.5	-11.4	22.7	6.6	-7.7	18.2	6.4
China	9.2	10.4	9.2	-10.5	28.4	9.3	2.9	22.1	9.7
Japan	-6.3	4.0	-0.5	-24.9	27.5	-0.5	-12.2	10.1	1.9
India	6.8	10.1	7.8	-6.0	22.0	16.1	3.6	22.7	6.6
Newly industrialized economies (4) ^b	-0.6	8.0	4.2	-5.7	20.9	6.0	-11.4	17.9	2.0
Memo: Developed economies	-4.1	2.9	1.5	-15.1	13.0	4.7	-14.4	10.9	2.8
Memo: Developing and CIS	2.2	7.2	5.7	-7.4	14.9	5.4	-10.5	18.1	7.9

^a Includes the Caribbean.

^b Hong Kong, China; Republic of Korea; Singapore; and Chinese Taipei.

Source: WTO Secretariat.

Figure 1.3: Real GDP growth and trade of euro area economies, 2008-11
(annualized percentage change over previous quarter)



2. Merchandise trade in volume (i.e. real) terms

World merchandise trade volume grew 5.0 per cent in 2011, and Asia's 6.6 per cent increase led all regions (see Table 1.1). One of the more significant developments in 2011 was the 8.3 per cent contraction in the volume of Africa's exports. This was largely due to the civil war in Libya, which reduced the country's oil shipments by an estimated 75 per cent. Japan's exports also fell by the same 0.5 per cent as the country's GDP, while shipments from the CIS advanced just 1.8 per cent.

Although Africa recorded a respectable 5.0 per cent increase in imports, other resource-exporting regions

performed better. Imports of the CIS grew faster than those of any other region at 16.7 per cent, followed by South and Central America's at 10.4 per cent. Meanwhile, Japan's import growth was the slowest of any major economy or region in 2011 at 1.9 per cent.

India had the fastest export growth among major traders in 2011, with shipments rising 16.1 per cent. Meanwhile, China had the second-fastest export growth of any major economy at 9.3 per cent.

The combination of low export volume growth and high import volume growth seen in the Commonwealth of Independent States in 2011 can be attributed to the 32 per cent rise in energy prices for the year, which boosted export earnings and allowed more foreign goods to be imported (see Table 1.2).

Table 1.2: World prices of selected primary products, 2000-11
(annual percentage change and US\$ per barrel)

	2009	2010	2011	2000-11	2005-11
All commodities	-30	26	26	12	14
Metals	-19	48	14	15	18
Beverages ^a	-15	11	20	8	11
Food	2	14	17	10	13
Agricultural raw materials	-17	33	23	5	9
Energy	-37	26	32	15	15
Memo: Crude oil price in US\$/barrel ^b	62	79	104	56	76

^a Comprising coffee, cocoa beans and tea.

^b Average of Brent, Dubai, and West Texas Intermediate.

Source: IMF International Financial Statistics.

Appendix Figure 1 shows seasonally adjusted quarterly merchandise trade volumes for selected economies, revealing some of the dynamics of changes that occurred in 2011. The decline in extra-EU imports (i.e. imports from outside the European Union) measured -3.8 per cent in the fourth quarter, equivalent to 14.4 per cent at an annualized rate. Such a rate of decline is unlikely to go on for very long, but it helps to explain the weakness of exports of other economies at the time. Imports of the United States were flat rather than falling during 2011, but both the United States and the European Union saw their exports rise over the course of the year.

The other major development was the slump in Chinese imports that occurred around the time of the Japanese earthquake in the second quarter of 2011. Between the first and second quarters, China's imports dropped 6.1 per cent, equivalent to 27 per cent annually, but in subsequent quarters trade rose 4.2 per cent (18 per cent annualized) and 7.3 per cent (32 per cent annualized). This is consistent with a strong but relatively short-lived direct impact from the disaster, although other indirect influences might be just as important. It also demonstrated the strong insertion of China in Asian value chains.

Although not shown in the charts, the volume of Thailand's exports plunged 8.5 per cent in the fourth quarter due to flooding that significantly affected exports of intermediate goods, further disturbing global production networks.

3. Merchandise and commercial services trade in value (i.e. dollar) terms

The total dollar value of world merchandise exports jumped 19 per cent to US\$ 18.2 trillion in 2011 (see Table 1.3).¹ This increase was nearly as large as the 22 per cent rise in 2010 and was driven in large part by higher primary commodity prices.

Commercial services exports also grew 11 per cent in 2011 to US\$ 4.1 trillion. The share of commercial services in total goods plus commercial services trade (on a balance of payments basis) was 18.6 per cent, the smallest such share since 1990.

Transport services recorded the slowest growth of any sub-category of services (8 per cent), followed by other commercial services (11 per cent) and travel (12 per cent).

The slow growth of transport services is perhaps not surprising considering the close relationship between this category of services and trade in goods, which stagnated in the second half of 2011. An oversupply of new container ships may have also depressed revenues in the shipping sector.

Appendix tables 1 to 6 provide detailed information on nominal merchandise and commercial services trade flows by region and for selected economies. They also include tables of leading exporters and importers with and without intra-EU trade (i.e. trade between EU members). Some noteworthy developments for merchandise trade and commercial services are summarized below.

(a) Merchandise trade

The dollar value of North America's merchandise exports rose 16 per cent in 2011 to US\$ 2.28 trillion (equal to 12.8 per cent of the world total), while imports grew 15 per cent to US\$ 3.09 trillion (17.2 per cent) (see Appendix Table 1).

South and Central America's exports advanced 27 per cent to US\$ 749 billion (4.2 per cent of the world total), buoyed by stronger primary commodity prices. At the same time, the region's imports increased by 24 per cent to US\$ 727 billion (4.0 per cent).

Europe's nominal exports grew 17 per cent to US\$ 6.60 trillion, or 37.1 per cent of the world total. The region's imports were also up 17 per cent to US\$ 6.85 trillion (38.1 per cent).

Table 1.3: World exports of merchandise and commercial services, 2005-11
(US\$ billion and annual percentage change)

	Value	Annual percentage change			
		2009	2010	2011	2005-11
	2011				
Merchandise	18,217	-22	22	19	10
Commercial services	4,149	-11	10	11	9
Transport	855	-23	15	8	7
Travel	1,063	-9	9	12	7
Other commercial services	2,228	-7	8	11	10

Source: WTO Secretariat for merchandise and WTO and UNCTAD Secretariats for commercial services.

Exports of the Commonwealth of Independent States jumped 34 per cent to US\$ 788 billion, supported by rising energy prices. Imports also increased by 30 per cent to US\$ 540 billion. Shares of CIS exports and imports in world trade were 4.4 per cent and 3.0 per cent, respectively.

Africa's exports were up 17 per cent to US\$ 597 billion (3.4 per cent of the world total) while imports rose 18 per cent to US\$ 555 billion (3.1 per cent).

Exports from the Middle East surged 37 per cent in dollar terms to US\$ 1.23 trillion (or 6.9 per cent of the world total) as a result of rising oil prices. In contrast to this, imports only increased by 16 per cent to US\$ 6.65 billion (3.7 per cent).

Finally, Asia's exports were up 18 per cent in 2011 to US\$ 5.53 trillion (31.1 per cent of the world total) while imports advanced 23 per cent to US\$ 5.57 trillion (30.9 per cent).

The top five merchandise exporters in 2011 were China (US\$ 1.90 trillion, or 10.4 per cent of world exports), the United States (US\$ 1.48 trillion, 8.1 per cent), Germany (US\$ 1.47 trillion, 8.1 per cent), Japan (US\$ 823 billion, 4.5 per cent) and the Netherlands (US\$ 660 billion, 3.6 per cent). The leading importers were the United States (US\$ 2.27 trillion, 12.3 per cent of world imports), China (US\$ 1.74 trillion, 9.5 per cent), Germany (US\$ 1.25 trillion, 6.8 per cent), Japan (US\$ 854 billion, 4.6 per cent) and France (US\$ 715 billion, 4 per cent) (see Appendix Table 3).

If we ignore trade between European Union member countries and treat the EU as a single entity, the top exporters were the European Union (US\$ 2.13 trillion, or 14.9 per cent of the world total), China (13.3 per cent), the United States (10.3 per cent), Japan (5.7 per cent) and the Republic of Korea (US\$ 555 billion, or 3.9 per cent). The leading importers, excluding trade between EU countries, were the European Union (US\$ 2.34 trillion or 16.2 per cent of world imports), the United States (15.6 per cent), China (12.0 per cent), Japan (5.9 per cent) and the Republic of Korea (US\$ 425 billion, or 3.6 per cent) (see Appendix Table 4).

There were few significant moves up or down in the world rankings in 2011. The Russian Federation went from being the 12th largest exporter of merchandise in 2010 to being the ninth in 2011 (including EU members).

(b) Commercial services trade

The region with the fastest growth in commercial services exports in 2011 was the CIS, with 20 per cent growth in the dollar value of its exports. Africa had the slowest export growth of any region at zero per cent. All other regions recorded double-digit growth between 10 and 14 per cent. The slow growth of African exports was largely due to the turmoil in North African countries.

Egypt and Tunisia were especially hard hit as their commercial services exports fell 20 per cent and 19 per cent, respectively. However, Sub-Saharan Africa's exports increased in line with the world average of 11 per cent (see Appendix Table 2).

Meanwhile, African services imports rose 9 per cent, slightly less than the world average of 10 per cent. In contrast to exports, there was not as much of a divergence between Northern Africa and Sub-Saharan Africa on the import side, as the former grew 7.0 per cent and the latter 9.5 per cent. The region with the fastest growth in services imports was the CIS at 21 per cent, followed closely by South and Central America at 18 per cent. Other regions recorded growth rates for commercial services imports between 8 and 14 per cent.

The top five exporters of commercial services in 2011 were the United States (US\$ 578 billion, or 14 per cent of the world total), the United Kingdom (US\$ 274 billion, 7 per cent), Germany (US\$ 253 billion, 6 per cent), China (US\$ 182 billion, 4 per cent) and France (US\$ 161 billion, 4 per cent). The United Kingdom replaced Germany as the world's second-largest exporter of services compared with last year's tables, but this was mainly due to a large upward revision in official statistics on UK exports of other business services and financial services, which together make up roughly half of all UK commercial services exports (see Appendix Table 5).

The top five importers of commercial services were the United States (US\$ 391 billion, or 10 per cent of the world total), Germany (US\$ 284 billion, 7 per cent), China (US\$ 236 billion, 6.1 per cent), the United Kingdom (US\$ 171 billion, 4 per cent) and Japan (US\$ 165 billion, 4.3 per cent). There were no changes in the ranking of the top importers.

The above figures include intra-EU commercial services trade, i.e. services trade between European Union member countries. If this trade is excluded from the world total and the European Union is treated as a single entity, the EU becomes the top exporter of commercial services (US\$ 789 billion, 24.8 per cent of the world total), followed by the United States (US\$ 578 billion, 18.2 per cent), China (US\$ 182 billion, 5.7 per cent), India (US\$ 148 billion, 4.7 per cent) and Japan (US\$ 143 billion, 4.5 per cent). The European Union also becomes the leading importer (US\$ 639 billion, 21.1 per cent of the world total), followed by the United States (US\$ 391 billion, 12.9 per cent), China (US\$ 236 billion, 7.8 per cent), Japan (US\$ 165 billion, 5.4 per cent) and India (US\$ 130 billion, 4.3 per cent) (see Appendix Table 6).

4. Sectoral developments

Prices for traded manufactured goods have tended to be more stable than those of primary products, both

before and after the economic crisis. As a result, movements in nominal trade flows reflect changes in quantities reasonably well. With this in mind, Figure 1.4 shows year-on-year growth in the quarterly value of world trade in several classes of manufactured goods.

All types of manufactured goods saw year-on-year growth fall towards zero over the course of 2011. For example, world trade in automotive products slid from 44 per cent in the first quarter of 2010 to 10 per cent in the fourth quarter of 2011. Office and telecom equipment went from positive to negative, as year-on-year growth rates fell from around plus 14 per cent in the first quarter to minus 2 per cent in the fourth quarter.

5. Exchange rates

The Japanese yen and the Swiss franc both recorded significant nominal appreciations against the US dollar in 2011. The yen was up 10 per cent year-on-year, partly due to the safe haven role of the currency during times of uncertainty. Meanwhile, the franc jumped 17 per cent, prompting interventions by the Swiss National Bank in currency markets to force down the value of the currency, especially against the euro. The Brazilian real was also up 5.4 per cent against the dollar, and the Chinese yuan and Korean won rose 4.7 per cent and 4.3 per cent, respectively. Despite the sovereign debt crisis in Europe, the euro appreciated 5 per cent against the dollar (see Figure 1.5).

Figure 1.4: Quarterly world exports of manufactured goods by product, 2008Q1-2011Q4 (year-on-year percentage change)

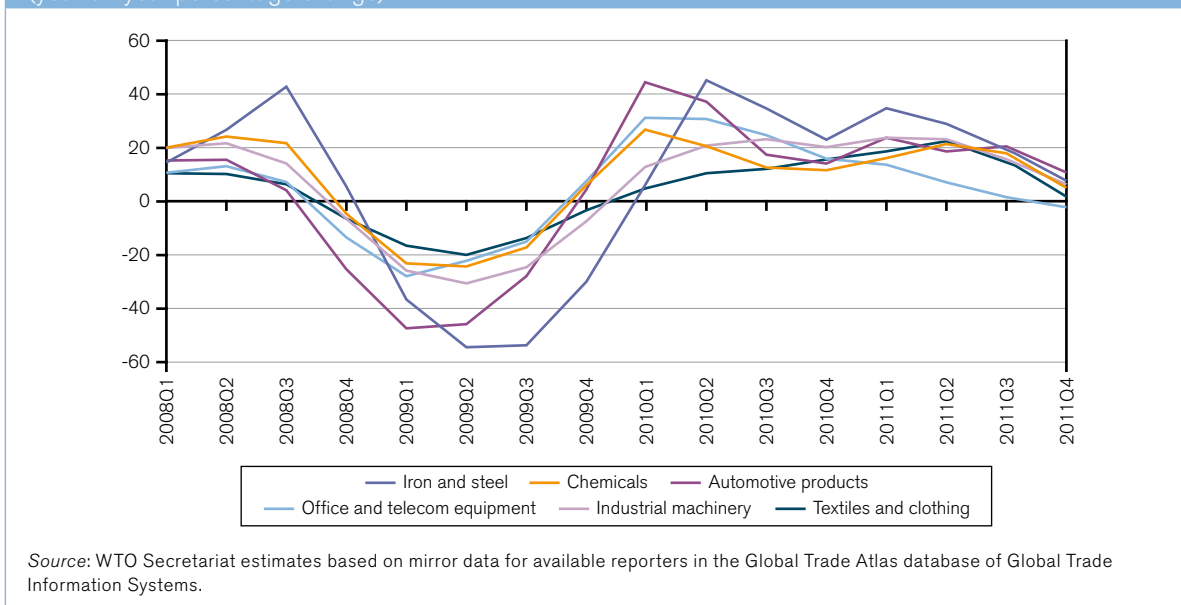
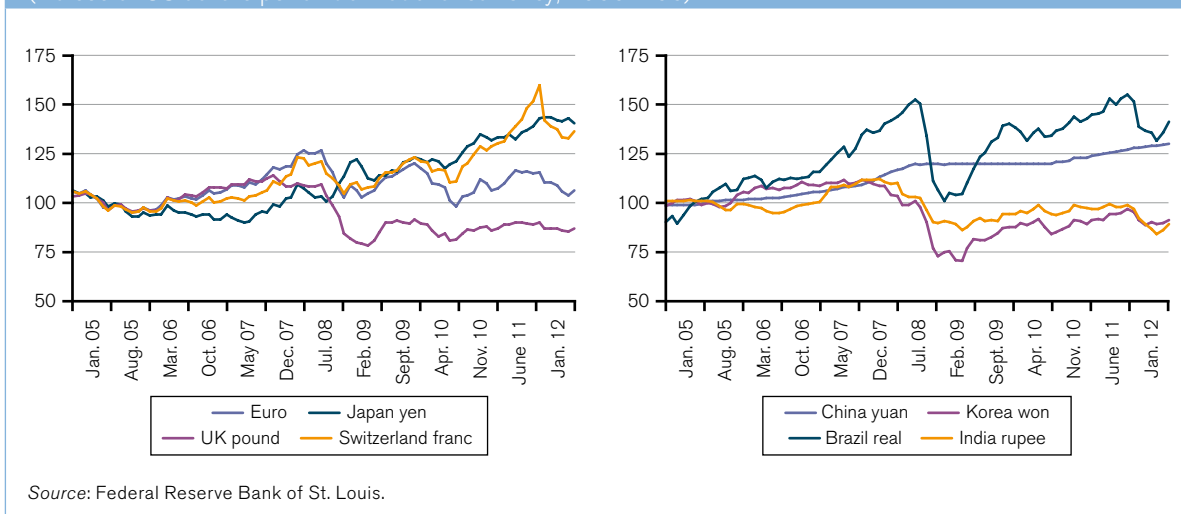


Figure 1.5: Nominal dollar exchange rates, January 2005 – February 2012 (indices of US dollars per unit of national currency, 2000=100)



Nominal exchange rates such as these may over- or under-state the competitive effects of exchange rate movements. As a result, “real effective” rates that average the exchange value of a currency against many trading partners while adjusting for differences in inflation rates may provide a better indication of the competitiveness of a country's exports.

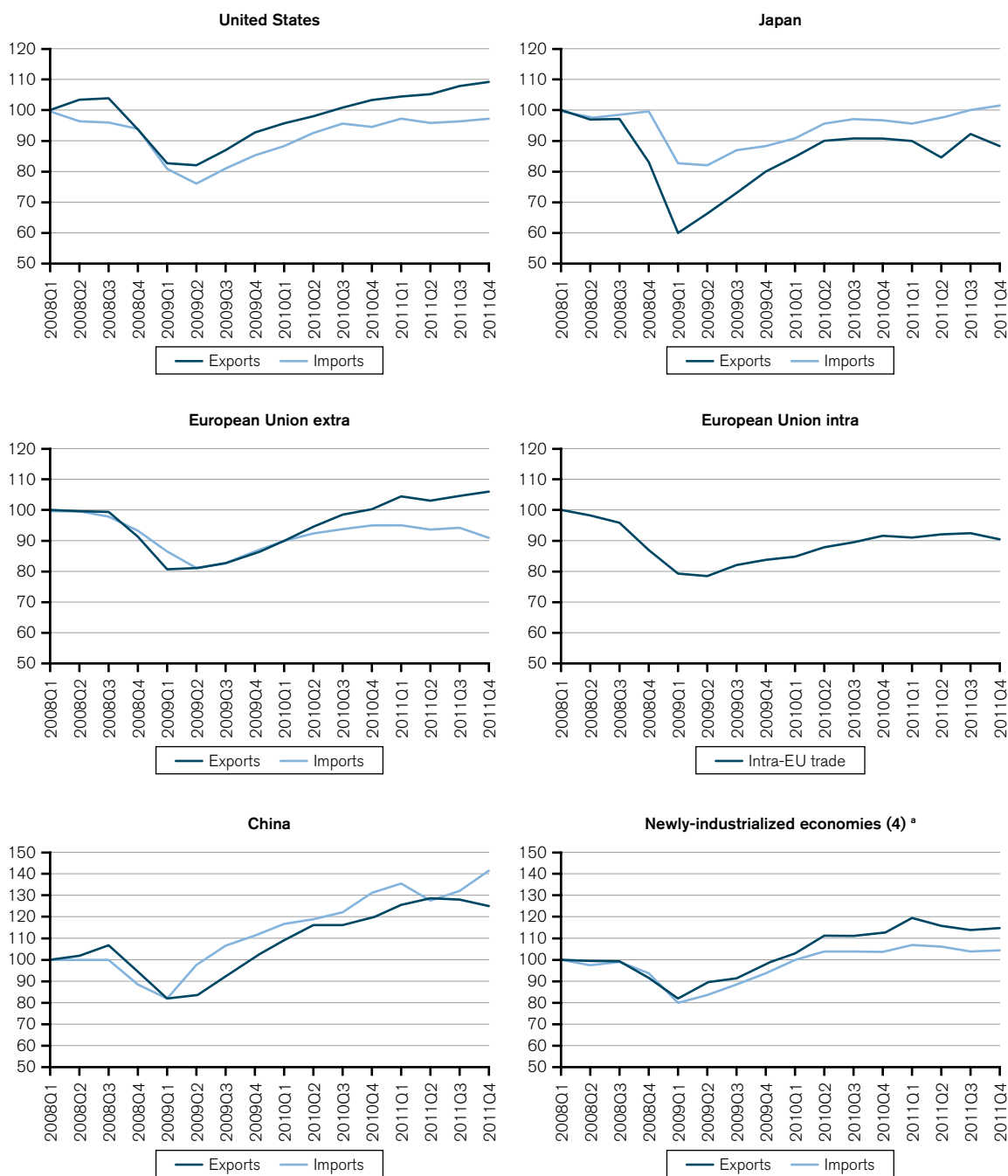
Real effective exchange rates supplied by the International Monetary Fund show that the US dollar's depreciation in 2011 was even stronger in real effective terms (-4.9 per cent) than in nominal terms. On the other hand, the average appreciation of other major currencies was over-stated. The Japanese yen only appreciated 1.7 per cent in real terms while the Chinese yuan rose 2.7 per cent. Brazil's currency registered a strong increase of 4.7 per cent in real effective terms, while the euro's rise of 1.8 per cent was relatively small.

Endnote

- 1 World exports of goods measured on a balance of payments basis were up 20 per cent in 2011.

C. Appendix figures and tables

Appendix Figure 1: **Seasonally adjusted quarterly merchandise trade volume indices, 2008Q1 – 2011Q4**
(indices, 2008Q1 = 100)



^a Hong Kong, China; Republic of Korea; Singapore; and Chinese Taipei.

Sources: National statistics and WTO Secretariat calculations. Seasonally adjusted figures for the United States, the European Union, Japan and Hong Kong, China are taken from national sources. Non-seasonally adjusted volume figures for other countries were seasonally adjusted by the Secretariat

Appendix Figure 2: Monthly merchandise exports and imports of selected economies, January 2008-February 2012 (US\$ billion)



Sources: IMF International Financial Statistics, Global Trade Information Services GTA database, national statistics.

Appendix Table 1: World merchandise trade by region and selected economies, 2011
(US\$ billion and percentage)

	Exports					Imports				
	Value	Annual percentage change				Value	Annual percentage change			
	2011	2005-11	2009	2010	2011	2011	2005-11	2009	2010	2011
World	17,779	10	-23	22	20	18,000	9	-23	21	19
North America	2,283	8	-21	23	16	3,090	5	-25	23	15
United States	1,481	9	-18	21	16	2,265	5	-26	23	15
Canada ^a	452	4	-31	23	17	462	6	-21	22	15
Mexico	350	9	-21	30	17	361	8	-24	28	16
South and Central America^b	749	13	-23	26	27	727	16	-25	30	24
Brazil	256	14	-23	32	27	237	20	-27	43	24
Other South and Central America ^b	493	12	-24	22	27	490	14	-25	24	25
Europe	6,601	7	-22	12	17	6,854	7	-25	13	17
European Union (27)	6,029	7	-22	12	17	6,241	7	-25	13	16
Germany	1,474	7	-23	12	17	1,254	8	-22	14	19
France	597	4	-21	8	14	715	6	-22	9	17
Netherlands	660	8	-22	15	15	597	9	-24	17	16
United Kingdom	473	4	-23	15	17	636	4	-24	16	13
Italy	523	6	-25	10	17	557	6	-26	17	14
Commonwealth of Independent States (CIS)	788	15	-36	31	34	540	17	-33	24	30
Russian Federation ^a	522	14	-36	32	30	323	17	-34	30	30
Africa	597	11	-30	29	17	555	14	-15	15	18
South Africa	97	11	-24	31	20	122	12	-27	27	29
Africa less South Africa	500	12	-31	29	17	433	14	-12	12	15
Oil exporters ^c	331	11	-38	34	15	160	15	-9	8	11
Non oil exporters	169	13	-14	21	20	274	14	-14	15	18
Middle East	1,228	15	-31	27	37	665	12	-15	13	16
Asia	5,534	12	-18	31	18	5,568	13	-20	33	23
China	1,899	16	-16	31	20	1,743	18	-11	39	25
Japan	823	6	-26	33	7	854	9	-28	26	23
India	297	20	-15	33	35	451	21	-20	36	29
Newly-industrialized economies (4) ^d	1,290	10	-17	30	16	1,302	10	-24	32	18
Memorandum										
MERCOSUR ^e	354	14	-22	29	26	334	20	-28	43	25
ASEAN ^f	1,244	11	-18	29	18	1,151	11	-23	31	21
EU (27) extra-trade	2,131	8	-20	17	19	2,344	8	-27	19	17
Least-developed countries (LDCs)	203	16	-25	27	25	202	15	-5	11	19

a. Imports are valued f.o.b.

b. Includes the Caribbean. For composition of groups see the Technical Notes of WTO, *International Trade Statistics*, 2011.

c. Algeria, Angola, Cameroon, Chad, Congo, Equatorial Guinea, Gabon, Libya, Nigeria, Sudan.

d. Hong Kong, China; Republic of Korea; Singapore; and Chinese Taipei.

e. Common Market of the Southern Cone: Argentina, Brazil, Paraguay, Uruguay.

f. Association of Southeast Asian Nations: Brunei Darussalam, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand, Viet Nam.

Source: WTO Secretariat.

Appendix Table 2: World trade in commercial services by region and selected country, 2011 (US\$ billion and percentage)										
	Exports					Imports				
	Value	Annual percentage change				Value	Annual percentage change			
	2011	2005-11	2009	2010	2011	2011	2005-11	2009	2010	2011
World	4,150	9	-11	10	11	3,865	9	-11	10	10
North America	668	8	-7	9	10	516	6	-8	8	8
United States	578	8	-6	9	11	391	6	-7	6	6
South and Central America^a	130	11	-8	15	14	163	15	-8	23	18
Brazil	37	16	-9	15	21	73	22	-1	36	22
Europe	1,964	7	-13	4	10	1,605	6	-13	3	8
European Union (27)	1,762	7	-13	4	10	1,480	6	-12	2	4
Germany	253	8	-9	3	9	284	5	-12	3	8
United Kingdom	274	5	-14	2	11	171	1	-19	1	7
France	161	5	-13	1	11	141	5	-8	2	7
Netherlands	128	6	-9	4	11	118	6	-3	-2	12
Spain	141	7	-14	1	14	91	5	-17	0	5
Commonwealth of Independent States (CIS)	96	15	-17	13	20	133	15	-19	19	21
Russian Federation	54	14	-19	8	22	90	16	-20	22	24
Ukraine	19	13	-23	24	13	14	13	-30	10	19
Africa	85	7	-10	11	-0	149	13	-12	10	9
South Africa	15	5	-6	17	8	20	9	-13	25	13
Egypt	19	5	-14	11	-20	13	5	-22	2	-0
Morocco	14	11	-7	2	14	6	13	-6	8	11
Middle East	111	...	-3	6	10	210	...	-7	9	10
Saudi Arabia, Kingdom of	12	...	3	10	17	55	...	-5	8	8
Israel	26	7	-10	13	6	20	7	-14	6	14
Asia	1,096	13	-11	23	12	1,091	11	-10	21	14
China	182	16	-12	32	7	236	19	0	22	23
Japan	143	6	-14	10	3	165	5	-12	6	6
India	148	19	-13	33	20	130	19	-9	45	12
Singapore	125	14	-6	20	12	110	12	-9	22	15
Korea, Republic of	94	12	-19	19	8	98	9	-17	19	3
Hong Kong, China	121	11	-6	23	14	56	9	-7	16	10
Australia	50	9	-8	15	6	59	12	-13	22	18
Memorandum item										
Extra-EU(27) trade	789	8	-13	6	12	639	7	-13	4	8

a. Includes the Caribbean. For composition of groups see Chapter IV Metadata of WTO International Trade Statistics, 2011.

Note: While provisional full-year data were available in early March for 50 countries accounting for more than two-thirds of world commercial services trade, estimates for most other countries are based on data for the first three-quarters.

Source: WTO and UNCTAD Secretariats.

Appendix Table 3: Merchandise trade: leading exporters and importers, 2011
(US\$ billion and percentage)

Rank	Exporters	Value	Share	Annual percentage change	Rank	Importers	Value	Share	Annual percentage change
1	China	1,899	10.4	20	1	United States	2,265	12.3	15
2	United States	1,481	8.1	16	2	China	1,743	9.5	25
3	Germany	1,474	8.1	17	3	Germany	1,254	6.8	19
4	Japan	823	4.5	7	4	Japan	854	4.6	23
5	Netherlands	660	3.6	15	5	France	715	3.9	17
6	France	597	3.3	14	6	United Kingdom	636	3.5	13
7	Korea, Republic of	555	3.0	19	7	Netherlands	597	3.2	16
8	Italy	523	2.9	17	8	Italy	557	3.0	14
9	Russian Federation	522	2.9	30	9	Korea, Republic of	524	2.9	23
10	Belgium	476	2.6	17	10	Hong Kong, China	511	2.8	16
						retained imports	130	0.7	16
11	United Kingdom	473	2.6	17	11	Canada ^a	462	2.5	15
12	Hong Kong, China	456	2.5	14	12	Belgium	461	2.5	17
	domestic exports	17	0.1	14					
	re-exports	439	2.4	14					
13	Canada	452	2.5	17	13	India	451	2.5	29
14	Singapore	410	2.2	16	14	Singapore	366	2.0	18
	domestic exports	224	1.2	23		retained imports ^b	180	1.0	27
	re-exports	186	1.0	10					
15	Saudi Arabia, Kingdom of ^c	365	2.0	45	15	Spain	362	2.0	11
16	Mexico	350	1.9	17	16	Mexico	361	2.0	16
17	Taipei, Chinese	308	1.7	12	17	Russian Federation ^a	323	1.8	30
18	Spain	297	1.6	17	18	Taipei, Chinese	281	1.5	12
19	India	297	1.6	35	19	Australia	244	1.3	21
20	United Arab Emirates ^c	285	1.6	30	20	Turkey	241	1.3	30
21	Australia	271	1.5	27	21	Brazil	237	1.3	24
22	Brazil	256	1.4	27	22	Thailand	228	1.2	25
23	Switzerland	235	1.3	20	23	Switzerland	208	1.1	18
24	Thailand	229	1.3	17	24	Poland	208	1.1	17
25	Malaysia	227	1.2	14	25	United Arab Emirates ^c	205	1.1	28
26	Indonesia	201	1.1	27	26	Austria	192	1.0	20
27	Poland	187	1.0	17	27	Malaysia	188	1.0	14
28	Sweden	187	1.0	18	28	Indonesia	176	1.0	30
29	Austria	179	1.0	17	29	Sweden	175	1.0	18
30	Czech Republic	162	0.9	22	30	Czech Republic	151	0.8	20
	Total of above^d	14,835	81.4	-		Total of above^d	15,180	82.6	-
	World^d	18,215	100.0	19		World^d	18,380	100.0	19

a. Imports are valued f.o.b.

b. Singapore's retained imports are defined as imports less re-exports.

c. Secretariat estimates.

d. Includes significant re-exports or imports for re-export.

Source: WTO Secretariat.

Appendix Table 4: Merchandise trade: leading exporters and importers
(excluding intra-EU (27) trade), 2011
(US\$ billion and percentage)

Rank	Exporters	Value	Share	Annual percentage change	Rank	Importers	Value	Share	Annual percentage change
1	Extra-EU(27) exports	2,131	14.9	19	1	Extra-EU(27) imports	2,344	16.2	17
2	China	1,899	13.3	20	2	United States	2,265	15.6	15
3	United States	1,481	10.3	16	3	China	1,743	12.0	25
4	Japan	823	5.7	7	4	Japan	854	5.9	23
5	Korea, Republic of	555	3.9	19	5	Korea, Republic of	524	3.6	23
6	Russian Federation	522	3.6	30	6	Hong Kong, China	511	3.5	16
						retained imports	130	0.9	16
7	Hong Kong, China	456	3.2	14	7	Canada ^a	462	3.2	15
	domestic exports	17	0.1	14					
	re-exports	439	3.1	14					
8	Canada	452	3.2	17	8	India	451	3.1	29
9	Singapore	410	2.9	16	9	Singapore	366	2.5	18
	domestic exports	224	1.6	23		retained imports ^b	180	1.2	27
	re-exports	186	1.3	10					
10	Saudi Arabia, Kingdom of ^c	365	2.5	45	10	Mexico	361	2.5	16
11	Mexico	350	2.4	17	11	Russian Federation ^a	323	2.2	30
12	Taipei, Chinese	308	2.2	12	12	Taipei, Chinese	281	1.9	12
13	India	297	2.1	35	13	Australia	244	1.7	21
14	United Arab Emirates ^c	285	2.0	30	14	Turkey	241	1.7	30
15	Australia	271	1.9	27	15	Brazil	237	1.6	24
16	Brazil	256	1.8	27	16	Thailand	228	1.6	25
17	Switzerland	235	1.6	20	17	Switzerland	208	1.4	18
18	Thailand	229	1.6	17	18	United Arab Emirates ^c	205	1.4	28
19	Malaysia	227	1.6	14	19	Malaysia	188	1.3	14
20	Indonesia	201	1.4	27	20	Indonesia	176	1.2	30
21	Norway	159	1.1	21	21	South Africa	122	0.8	29
22	Turkey	135	0.9	19	22	Saudi Arabia, Kingdom of	112	0.8	5
23	Iran ^c	131	0.9	30	23	Viet Nam	107	0.7	26
24	Nigeria ^c	119	0.8	42	24	Norway	91	0.6	17
25	Kuwait, State of ^c	98	0.7	46	25	Ukraine	83	0.6	36
26	Qatar ^c	98	0.7	58	26	Israel	76	0.5	24
27	South Africa	97	0.7	20	27	Chile	74	0.5	26
28	Viet Nam	97	0.7	34	28	Argentina	74	0.5	31
29	Venezuela, Bolivarian Rep. of	93	0.6	41	29	Iran ^c	68	0.5	5
30	Kazakhstan	88	0.6	48	30	Philippines ^c	64	0.4	9
	Total of above^d	12,865	89.8	-		Total of above^d	13,085	90.3	-
	World^d (excl. Intra-EU(27))	14,320	100.0	20		World^d (excl. Intra-EU(27))	14,485	100.0	20

a. Imports are valued f.o.b.

b. Singapore's retained imports are defined as imports less re-exports.

c. Secretariat estimates.

d. Includes significant re-exports or imports for re-export.

Source: WTO Secretariat.

Appendix Table 5: **Leading exporters and importers in world trade in commercial services, 2011**
(US\$ billion and percentage)

Rank	Exporters	Value	Share	Annual percentage change	Rank	Importers	Value	Share	Annual percentage change
1	United States	578	13.9	11	1	United States	391	10.1	6
2	United Kingdom	274	6.6	11	2	Germany	284	7.3	8
3	Germany	253	6.1	9	3	China	236	6.1	23
4	China	182	4.4	7	4	United Kingdom	171	4.4	7
5	France	161	3.9	11	5	Japan	165	4.3	6
6	India	148	3.6	20	6	France	141	3.6	7
7	Japan	143	3.4	3	7	India	130	3.4	12
8	Spain	141	3.4	14	8	Netherlands	118	3.1	12
9	Netherlands	128	3.1	11	9	Italy	115	3.0	5
10	Singapore	125	3.0	12	10	Ireland	113	2.9	6
11	Hong Kong, China	121	2.9	14	11	Singapore	110	2.9	15
12	Ireland	107	2.6	10	12	Canada	99	2.6	10
13	Italy	107	2.6	9	13	Korea, Republic of	98	2.5	3
14	Switzerland	96	2.3	17	14	Spain	91	2.4	5
15	Korea, Republic of	94	2.3	8	15	Russian Federation	90	2.3	24
16	Belgium	86	2.1	1	16	Belgium	82	2.1	5
17	Sweden	76	1.8	16	17	Brazil	73	1.9	22
18	Canada	74	1.8	10	18	Australia	59	1.5	18
19	Luxembourg	72	1.7	8	19	Denmark	56	1.5	11
20	Denmark	66	1.6	11	20	Hong Kong, China	56	1.4	10
21	Austria	60	1.4	11	21	Sweden	56	1.4	15
22	Russian Federation	54	1.3	22	22	Saudi Arabia, Kingdom of	55	1.4	8
23	Australia	50	1.2	6	23	Thailand	50	1.3	13
24	Taipei, Chinese	46	1.1	14	24	Switzerland	47	1.2	18
25	Norway	42	1.0	7	25	United Arab Emirates ^a	46	1.2	...
26	Thailand	40	1.0	19	26	Austria	44	1.2	20
27	Greece	40	1.0	7	27	Norway	44	1.1	4
28	Macao, China	39	0.9	36	28	Taipei, Chinese	41	1.1	11
29	Turkey	38	0.9	12	29	Luxembourg	40	1.0	10
30	Poland	37	0.9	12	30	Malaysia	37	1.0	17
	Total of above	3,480	83.8	-		Total of above	3,140	81.2	-
	World	4,150	100.0	11		World	3,865	100.0	10

a. preliminary estimates.

Note: Figures for a number of countries and territories have been estimated. Annual percentage changes and rankings are affected by continuity breaks in the series for a large number of economies, and by limitations in cross-country comparability.

Source: WTO and UNCTAD Secretariats.

Appendix Table 6: Leading exporters and importers in world trade in commercial services (excluding intra-EU(27) trade), 2011
(US\$ billion and percentage)

Rank	Exporters	Value	Share	Annual percentage change	Rank	Importers	Value	Share	Annual percentage change
1	Extra-EU(27) exports	789	24.8	12	1	Extra-EU(27) imports	639	21.1	8
2	United States	578	18.2	11	2	United States	391	12.9	6
3	China	182	5.7	7	3	China	236	7.8	23
4	India	148	4.7	20	4	Japan	165	5.4	6
5	Japan	143	4.5	3	5	India	130	4.3	12
6	Singapore	125	3.9	12	6	Singapore	110	3.7	15
7	Hong Kong, China	121	3.8	14	7	Canada	99	3.3	10
8	Switzerland	96	3.0	17	8	Korea, Republic of	98	3.2	3
9	Korea, Republic of	94	2.9	8	9	Russian Federation	90	3.0	24
10	Canada	74	2.3	10	10	Brazil	73	2.4	22
11	Russian Federation	54	1.7	22	11	Australia	59	2.0	18
12	Australia	50	1.6	6	12	Hong Kong, China	56	1.8	10
13	Taipei, Chinese	46	1.4	14	13	Saudi Arabia, Kingdom of	55	1.8	8
14	Norway	42	1.3	7	14	Thailand	50	1.7	13
15	Thailand	40	1.3	19	15	Switzerland	47	1.5	18
16	Macao, China	39	1.2	36	16	United Arab Emirates ^a	46	1.5	...
17	Turkey	38	1.2	12	17	Norway	44	1.5	4
18	Brazil	37	1.2	21	18	Taipei, Chinese	41	1.4	11
19	Malaysia	36	1.1	9	19	Malaysia	37	1.2	17
20	Israel	26	0.8	6	20	Indonesia	32	1.1	24
21	Indonesia	20	0.6	23	21	Mexico	25	0.8	16
22	Egypt	19	0.6	-20	22	Iran ^a	22	0.7	...
23	Ukraine	19	0.6	13	23	South Africa	20	0.7	13
24	Lebanese Republic ^a	18	0.6	...	24	Israel	20	0.7	14
25	Philippines	16	0.5	8	25	Angola ^a	20	0.7	...
26	Mexico	15	0.5	-0	26	Turkey	20	0.6	7
27	South Africa	15	0.5	8	27	Nigeria ^a	17	0.6	...
28	Argentina	14	0.4	10	28	Argentina	16	0.5	16
29	Morocco	14	0.4	14	29	Lebanese Republic ^a	15	0.5	...
30	Croatia	13	0.4	13	30	Ukraine	14	0.5	19
	Total of above	2,920	91.9	-		Total of above	2,690	88.9	-
	World (excl. intra-EU(27))	3,180	100.0	12		World (excl. intra-EU(27))	3,025	100.0	13

a. Preliminary estimates.

Note: Figures for a number of countries and territories have been estimated. Annual percentage changes and rankings are affected by continuity breaks in the series for a large number of economies, and by limitations in cross-country comparability.

Source: WTO and UNCTAD Secretariats.

II. Trade and public policies: A closer look at non-tariff measures in the 21st century

The *World Trade Report 2012* ventures beyond tariffs to examine other policy measures that can affect trade. Regulatory measures for trade in goods and services raise new and pressing challenges for international cooperation in the 21st century. More than many other measures, they reflect public policy goals (such as ensuring the health, safety and well-being of consumers) but they may also be designed and applied in a manner that unnecessarily frustrates trade. The focus of this report is on technical barriers to trade (TBT), sanitary and phytosanitary (SPS) measures (concerning food safety and animal/plant health) and domestic regulation in services.

A. Introduction

Non-tariff measures that can potentially affect trade in goods present the multilateral trading system with a basic policy challenge – how to ensure that these measures meet legitimate policy goals without unduly restricting or distorting trade. The same challenge applies to measures that can affect trade in services. This introduction discusses how the motivations for using non-tariff measures and services measures have evolved, complicating the policy panorama, but not changing the core challenge of how to manage the tension between public policy goals and trading opportunities.

1. What is the *World Trade Report 2012* about?

(a) Perspectives and insights in the *World Trade Report 2012*

This year's *World Trade Report* ventures beyond tariffs to investigate other policy measures that can affect trade. Since the birth of the General Agreement on Tariffs and Trade (GATT) in 1948, tariffs have been progressively reduced and “bound”.¹ Some tariffs still represent significant barriers to trade, but attention is progressively shifting to non-tariff measures (NTMs), such as technical barriers to trade, subsidies or export restrictions. Measures affecting trade in services have also come under greater scrutiny, reflecting the fact that services have increased their share of global trade while the complementarity between trade in goods and services has become more apparent, especially in international supply chains. This report seeks to deepen our understanding of the incidence, role and effects of NTMs and services measures, and to offer new insights into the scope for further international cooperation in these areas.

Non-tariff measures are nothing new. They have raised policy concerns since the establishment of the GATT. Such measures can dilute or even nullify the value of tariff bindings and affect trade in unpredictable ways. Drafters of the GATT included general rules covering broad categories of measures, such as Article XI on the general elimination of quantitative restrictions, which applies to border measures, and the “national treatment” obligation under Article III (i.e. granting equal treatment to imported and “like” domestic products), which applies to behind-the-border measures. Over time, more specific disciplines were negotiated, such as those applying to technical barriers to trade (TBT) or sanitary and phytosanitary (SPS) measures (i.e. food safety and animal and plant health measures). Services measures made their entry into the multilateral trading system in the Uruguay Round, which got under way in 1986. They are covered by the General Agreement on Trade in Services (GATS), which distinguishes between limitations to market access and national treatment, on the one hand, and domestic regulation on the other.

Both non-tariff measures and services measures continue to raise challenges for international cooperation in trade in the 21st century. Four broad considerations underpin the analysis of this report.

First, non-tariff measures and services measures tend to be opaque and driven by a variety of considerations. They are diverse in character and this diversity translates into highly variable trade and welfare effects. Moreover, not only do measures themselves affect trade, so too does the manner in which they are applied. Understanding, assessing and comparing

these effects is not only crucial for a sound policy strategy, but also from the perspective of international cooperation. Efforts to increase the transparency of NTMs, however, meet with a number of challenges. Better data on NTMs and services measures are needed to inform both our understanding of NTMs and the policy preferences that drive them.

Secondly, the mix of non-tariff measures is constantly changing. For example, when some measures are subjected to strict disciplines, a temptation may arise to replace them with other, less regulated measures. Similar forces may be at work in trade in services, although there is very little evidence in this area. Such “policy substitution” raises a number of challenges which are addressed in the Report. This is the context in which a protectionist use of NTMs is most likely to be encountered.

Thirdly, changes in the trading environment alter both the need for non-tariff measures and services measures and the nature of government incentives to use them. The Report discusses the challenges raised by developments such as the growth in global production networks, the recent financial crisis, the need to address climate change, and growing consumer concerns regarding food security and environmental issues in rich countries. The increasing number of reasons for using NTMs reflects a move away from a focus on the production side of the equation towards the defence of consumer and societal interests.

Fourthly, when it comes to international trade and trade-related policies, the greater use of non-tariff measures and their increasing complexity in terms of design and purpose have intensified the challenge of securing effective and stable international cooperation. These issues are discussed in the Report, including with respect to international convergence, private standards and domestic regulation in services.

Because of the diversity and complexity of non-tariff measures and services measures, the Report focuses on TBT and SPS measures in trade in goods, and on domestic regulation in trade in services. TBT/SPS measures are now among the most frequently encountered NTMs. By their very nature, they pose acute transparency problems, both in their formulation and administration. More than any other NTMs, TBT/SPS measures prompted by legitimate public policy objectives can have adverse trade effects, leading to questions about the design and application of these measures. They are also at the forefront of tensions that can arise over producer-driven and consumer-driven NTMs. Essential policy aspirations, such as ensuring the health, safety and well-being of consumers, for example, may have adverse trade effects considered by some parties as indefensible on public policy grounds.

To address the adverse effects on trade caused by TBT and SPS measures, international cooperation takes the form of regulatory convergence. This occurs in many different forms and at various levels. At the multilateral level, it raises a number of new challenges for the WTO that are discussed in this report. Some of those challenges are specific to developing countries, where capacity building rather than preferential treatment in the form of lower tariffs can help to address them. Domestic regulation in services raises the same challenges. As spelled out in the next subsection, these include regulations on licensing/qualification requirements and procedures as well as technical standards.

(b) Terminology

Lawyers, economists and other social scientists sometimes use similar terms to refer to different concepts, while at other times they use different terms to refer to similar concepts. For example, in WTO law, a standard is non-mandatory by definition (see TBT Agreement, Annex 1:2), while for economists, standards can be either mandatory or voluntary. Some terms have a specific definition in WTO law. For example, the term “measure” refers to actions and “non-actions” by the private sector and governmental bodies, while the term “regulation” is limited to governmental action and excludes private sector measures.

In this report, “non-tariff measures” refer to policy measures, other than tariffs, that can potentially affect trade in goods. “TBT/SPS measures” include all measures covered by the WTO’s TBT and SPS agreements. It therefore includes technical regulations, standards and conformity assessment procedures (as defined in Annex 1 of the TBT Agreement) and the SPS measures listed in Annex A, paragraph 1, of the SPS Agreement. Whenever the discussion excludes any governmental actions, the term “private measures” is used.

“Services measures” refer to all measures that can affect trade in services. Services measures listed under GATS Article XVI:2 are referred to as “market access limitations”. “National treatment restrictions” are services measures that accord services suppliers of another WTO member less favourable treatment than that accorded to the WTO member’s own “like” services suppliers (as of GATS Article XVII). Finally, “domestic regulation in services” includes licensing and qualification requirements and procedures, and technical standards (as of GATS Article VI:4 negotiating mandate). Exceptions to these definitions may be made from time to time when citing non-WTO research and/or databases that define their terms differently. In such cases, the source’s terms may be used, but any non-standard terminology is clearly identified.

The terms “non-tariff measures” and “services measures” distinguish between policy measures that affect trade in goods and those that affect trade in services respectively. In reality, the two categories of measures are not mutually exclusive. Certain services measures also affect trade in goods and thus should also be considered as NTMs. Conversely, certain NTMs affect trade in services. Such “cross-effects” may continue to grow in importance with the transformation of trade patterns and the expansion of global production sharing, but very little empirical evidence exists on their significance. The Report also discusses the relevance of “complementarity effects”, namely the mutually reinforcing effect of trade in goods and services.

(c) Structure of the Report

Section B examines the reasons why governments use non-tariff measures and to what extent these measures, which may be pursued for a variety of policy purposes, can have adverse trade effects. Similar questions are also addressed for services measures. It is argued that governments use NTMs to address various types of market failures or to pursue public policy objectives, but do so sometimes in ways that respond to the influence of special-interest groups. The opaqueness – in terms of purpose and effects – of certain NTMs, their appeal in the presence of domestic institutional and political constraints, as well as their effects on fixed and variable trade costs can explain why governments may give preference to economically inefficient measures or to protectionist measures in disguise.

Section B also considers whether, and how, the phenomenon of offshoring provides additional motivations for governments to distort domestic policies. Moreover, it analyses governments’ choice of alternative measures. The reasons for government intervention, and the potential for adverse trade effects, are also discussed with reference to services measures. The section ends by presenting case studies on NTMs applied in the context of climate change and food safety, and investigates to what extent measures taken may pose a challenge to international trade.

Section C surveys available sources of information on non-tariff measures and services measures and evaluates their relative strengths and weaknesses. It also summarizes the contents of the main databases containing information on NTMs and services measures and uses this information to establish a number of “stylized facts”, first about NTMs and then about services measures. Establishing those stylized facts turns out to be surprisingly difficult due to large gaps in the availability of data on both NTMs and services measures and to numerous shortcomings in existing datasets. Despite these limitations, many key features of the current regulatory landscape are

captured and a number of important trends in the use of NTMs over time are documented.

Section D discusses the magnitude and the trade effects of non-tariff measures and services measures in general before focusing on TBT and SPS measures and domestic regulation. Due to lack of transparency, as well as the importance of administrative behaviour in determining the impact of interventions, it is difficult to measure the effects of NTMs compared with those of tariffs. *Ad valorem* equivalents need to be calculated before making any comparison. However, various methodological challenges and shortcomings plague such calculations. Likewise, conceptual and methodological challenges arise in the calculation of tariff equivalents of services measures.

To the extent possible, the trade effects of TBT and SPS measures and of domestic regulation in services are disentangled in several dimensions, including the specific channel through which trade is affected, the effects across countries, sectors and firms, and the effects of the implementation of a measure, distinct from the effects of the design of the measure itself. Finally, the section examines whether regulatory harmonization and/or mutual recognition of standards help to reduce any trade-hindering effects of TBT and SPS measures and domestic regulation in services.

Section E covers international cooperation on non-tariff measures and services measures. The first part reviews the economic rationale for such cooperation in the context of trade agreements. It provides a framework for evaluating the efficient design of rules on NTMs in a trade agreement. The second part of this section looks at cooperation on TBT/SPS measures and domestic regulation in practice, both in the multilateral trading system and within other international fora and institutions. The third part of the section deals with the legal analysis of the treatment of NTMs in the GATT/WTO system and the interpretation of the rules that has emerged in recent international trade disputes. Special attention is devoted to how WTO agreements and dispute settlement have dealt with the distinction between legitimate and protectionist NTMs. The section concludes with a discussion of the challenges for improving and fostering further multilateral cooperation on NTMs and services measures.

2. History of NTMs in the GATT/WTO

Non-tariff measures have always presented the multilateral trading system with a basic policy challenge – how to ensure that NTMs do not restrict or distort trade, and at the same time ensure that they can be used for necessary and legitimate policy goals. While the policy challenge has remained the same, the specific issues, debates and solutions have evolved over time.

In the early GATT years, the main focus was on measures related to balance-of-payments, employment and development issues. More recently, the focus has been on the growing number of measures related to technical, health or environmental concerns. Whereas non-tariff measures in the past were often driven, or influenced in terms of design, by producer interests, today's NTMs reflect a greater diversity in public policy concerns, including consumer interests.

Deepening economic integration and the expansion of trade rules into new areas, such as agriculture, services and intellectual property, have added to the complexity of the debate – generating new trade frictions over domestic regulatory differences, drawing new constituencies, such as environmentalists and consumer groups, into the debate (Daly and Kuwahara, 1998; Low and Yeats, 1994) and raising new concerns about the tension between international rules and policy sovereignty. In response to these changing issues and pressures, the multilateral trading system continues to evolve. If in the past, the focus was on national measures – ensuring non-discrimination and transparency, while avoiding protectionism – in recent decades there has been a growing focus on transnational measures – encouraging regulatory cooperation, mutual recognition agreements and the international harmonization of standards.

Although the GATT was launched as a tariff agreement – and its early decades were focused mainly on the negotiation and “binding” of tariff reduction – the issue of non-tariff measures was unavoidable from the outset. Originally envisaged as one part of a future International Trade Organization (ITO), the GATT was the product of an initial tariff reduction negotiation among 23 countries that concluded in October 1947 – just in time to avoid the expiration of US negotiating authority, and six months in advance of the planned conclusion of the parallel ITO negotiations (Gardner, 1956).

To ensure that the agreed tariff reductions were not diluted or undercut by other trade measures, the GATT incorporated many of the commercial policy provisions of the draft ITO Charter.² Even this step was viewed sceptically by the US Congress, since the 1945 extension of the reciprocal trade agreements authority only authorized undertakings to reduce tariffs and other trade restrictions. The GATT's general clauses passed scrutiny only because they were justified as a necessary backstop to any tariff-reduction agreement (J. H. Jackson, 1989). When it became clear by 1950 that the Havana Charter establishing the ITO would not be ratified by the United States, it fell to the GATT to assume the commercial policy role that had been envisaged for the ITO – but without its organizational or procedural provisions, and minus the chapters on “Employment and Economic Activity”, “Economic Development and Reconstruction”, “Restrictive Business Practices” and “International Commodity Agreements”.

From a trade-opening perspective, the GATT drew a basic policy distinction between tariff and non-tariff measures. In particular, it favoured the use of tariffs. In addition to being revenue generating, tariffs were viewed as a "fairer" form of protection, more efficient in terms of their economic consequences and more amenable to reductions through negotiations. Quantitative restrictions and other non-tariff measures were seen as inherently more discriminatory, more varied and more disruptive of market forces.³

In principle, US negotiators took a more extreme view of non-tariff measures, claiming to want to prohibit all quantitative restrictions and most other non-tariff barriers to trade – under a comprehensive code governing world trade – and to initiate international negotiations to reduce tariffs (although the United States was also intent on protecting the quotas and restrictions that buttressed its own agricultural support programmes). However, other countries were just as intent on preserving their freedom to use quantitative restrictions, exchange controls and other NTMs for domestic policy purposes.

The United Kingdom and other European countries faced serious balance-of-payments difficulties at the end of the Second World War, and were unprepared to give up trade and exchange controls that they believed were needed to preserve macroeconomic stability. Under the influence of Keynesian economics and its wartime experience, the United Kingdom was intent on preserving its freedom to use trade restrictions in the pursuit of domestic "full employment". Meanwhile, developing countries resisted interference in their ambitious efforts to devise more stable international commodity agreements or to pursue domestic development and industrialization strategies. Thus, the negotiations leading to the Havana Charter for the planned International Trade Organization were dominated by intense debates about non-tariff measures – and quantitative restrictions, in particular – as nations struggled to construct a universal legal system that could also encompass their often conflicting domestic objectives and interests.

Given the complicated negotiating history on non-tariff measures, the variety of forms they took and the fact that many measures had a policy intent only indirectly related to trade, the GATT's architects failed to arrive at a comprehensive approach encompassing all non-tariff measures and treated various types of measures differently. Consistent with the GATT's basic policy thrust, certain NTMs were prohibited outright. Quantitative restrictions were the most important non-tariff measures when the GATT was being drafted, so it is not surprising that they are subject to detailed and complex provisions.

Article XI of the GATT clearly prohibited the introduction of new quantitative restrictions and required the elimination of existing ones, but this rule

was subject to three main exceptions. Reflecting Europe's balance-of-payments and currency concerns, the most important exception was for quantitative restrictions (and exchange controls) maintained for balance-of-payments purposes, detailed in Articles XII to XV. The second exception was for quantitative restrictions used in support of certain agricultural support programmes that aimed to keep domestic prices above world prices – a key objective of the United States. The third exception was limited to quantitative restrictions used by least-developed countries (LDCs) to promote infant industries and economic development, or to manage their own particular foreign exchange problems.

Other non-tariff measures were regulated, not prohibited, by GATT rules to ensure that necessary and legitimate domestic policies were non-discriminatory and least trade restrictive. The basic "national treatment" obligation, Article III, outlawed internal taxes or charges on imported products that were not applied equally to "like" domestic products. National treatment also required that domestic laws and regulations related to sales, purchases, transportation and distribution be non-discriminatory in their application. Although the GATT made no specific reference to technical or health standards, Article III's coverage of "laws, regulations, and requirements" was generally assumed to apply.

Significantly, Article XX explicitly recognized that measures "necessary to protect human, animal or plant life and health" were justified – confirming governments' responsibility for ensuring that goods of all kinds meet certain national standards – but only so long as these measures met the "necessity" standard, and did not "constitute a means of arbitrary or unjustified discrimination or a disguised restriction on international trade". The GATT also regulated certain non-tariff measures in an affirmative way through its Article X requirement that import-related laws, judicial decisions and regulations be "published promptly".

Other non-tariff measures were considered too complex or controversial to be addressed through general rules or "codes of conduct" alone. Article VI established rules regarding anti-dumping and countervailing duties – which were allowed only in certain prescribed cases, and at levels deemed sufficient to accomplish approved objectives. Article VII specified that customs valuation systems should not be based "on arbitrary or fictitious values" assigned to imports. Article VIII aimed to limit administrative fees assigned to imports and tried to simplify the documentation required by customs officials. Article IX sought to prevent discriminatory restraints on imports through the use of rules of origin (i.e. procedures which determine a product's country of origin and consequently how it is treated). Often the scope or coverage of such agreements was limited. On subsidies, for example, GATT Article XVI merely

required notification and consultation, with a view to reducing subsidization. Although the United States and several other delegations viewed state trading activities – which were widespread during the Second World War and its aftermath – as a significant trade distortion, GATT rules (Articles II:4, III:4 and XVII) did not prohibit state trading agencies but simply required that their purchases and sales be subject to market forces.

To further protect bound tariff reductions from being unfairly undermined by non-tariff measures, the original GATT architects also introduced an expansive and controversial “non-violation” provision⁴ – under Article XXIII:1 of the dispute settlement procedure – which allowed a WTO member to argue, even in the absence of any breach of GATT obligations, that its market access “benefits” had been nullified or impaired by “any measure” introduced by another member, or by “any other situation”, and to seek compensation. The inherent ambiguity of the non-violation provision was intentional, designed to cover not only government NTMs that fell outside the scope of existing GATT provisions, but measures that governments might invent in the future to circumvent or dilute their tariff commitments.

The first five GATT negotiating rounds – Geneva (1947), Annecy (1949), Torquay (1951), Geneva (1956) and Dillon (1960-61) – were devoted almost exclusively to tariff negotiations and the accession of new members. However, during the 1954-55 “review session”, members separately drafted protocols revising several GATT provisions dealing with non-tariff measures. While these early rounds, especially the first one, resulted in significant overall tariff reductions, the trade-opening impact was often frustrated by countries’ use of non-tariff measures – further increasing the pressure on the GATT system to clarify the distinction between protectionist and legitimate NTMs. Most European countries were still applying a range of quantitative restrictions, although less for balance-of-payments reasons,⁵ and increasingly to limit growing import competition from Asia, especially Japan, which had recently acceded to the GATT.

Concerns were also growing about the expansion of anti-dumping actions, especially by the United States and Canada, and the lack of rules governing the use and application of national technical, health and safety standards. The negotiation of the 1962 Long-Term Arrangement Regarding International Trade in Textiles (LTA) – which embodied a complex network of restrictions on textiles and clothing exports – went some way towards appeasing industrial lobbies and helped the US administration secure congressional negotiating authority for what became the Kennedy Round (Low, 1993). However, there were growing worries, especially among developing countries, about the extent to which such “voluntary” arrangements

were substituting trade regulation for markets and weakening the intent, if not the rules, of the multilateral trading system. In these and other areas, it was becoming clear that GATT rules often failed to give sufficiently precise guidance for the international regulation of non-tariff measures. The problem was made worse by the GATT’s “Protocol of Provisional Application”, which required countries to respect Part II rules – i.e. those covering non-tariff measures – only “to the fullest extent not incompatible with existing legislation” (Dam, 1970; J. H. Jackson, 1989). As a result, non-tariff measures that could be related to national legislation in existence prior to 1947 effectively “escaped” the GATT’s disciplines.

By the time the Kennedy Round was launched in 1964, pressure was building from governments to address a broad range of non-tariff measures, including those falling under the “escape clause”, “residual” quantitative restrictions, anti-dumping, state trading, government procurement, customs valuation, discriminatory import restrictions, border tax adjustments, and increasingly technical and health standards.⁶ At a meeting in May 1963, preparing the ground for the Kennedy Round, trade ministers agreed that the forthcoming negotiations “should deal not only with tariffs but also with non-tariff barriers”.⁷

Unfortunately, the Kennedy Round’s success in grappling with non-tariff measures was limited. An initially positive result was an agreement on anti-dumping measures, the so-called “Anti-dumping Code”, aimed at speedier and more transparent procedures in the application of national anti-dumping laws.⁸ The Code was negotiated separately from the Round’s tariff negotiations, and agreement was reached with surprisingly little difficulty (Winham, 1986). Another positive result was an American Selling Price (ASP) agreement, whereby the United States would have ended its use of a valuation system for benzenoid chemicals that Europe claimed was incompatible with the GATT, and the European Communities would have provided additional tariff reductions on chemicals and other trade concessions (J. H. Jackson, 1989).

The anti-dumping and ASP agreements represented important potential progress in the regulation of non-tariff measures. However, even before the conclusion of the Kennedy Round in 1967, opponents in Congress argued that both agreements had been negotiated without an explicit congressional mandate, and a bill was subsequently passed prohibiting the US Tariff Commission from implementing the codes (Winham, 1986). The agreements died as a result (Destler, 1986). Although the Kennedy Round was again successful in reducing tariffs, it did not bring about any significant changes to the GATT rules governing NTMs (Preeg, 1995).

It fell to the Tokyo Round between 1973 and 1979 to undertake a major reform and expansion of the GATT’s

non-tariff rules – in many ways picking up where the Kennedy Round had left off. Despite the GATT's success in lowering tariffs, members were increasingly aware that tariff reductions alone were not sufficient to guarantee market access. Concerns were again expressed that non-tariff measures were frustrating the intent of tariff commitments, and that existing GATT rules were in some cases not precise or detailed enough to ensure that certain NTMs were not discriminatory or unnecessarily trade restrictive. This view was especially prevalent in the United States, which was already worried about the effects on its exports of an overvalued dollar and the consolidation of the European common market.

The United States Commission on International Trade and Investment, the so-called "Williams Commission", appointed in 1971 to advise the administration on future trade policy, stressed that American exports were being increasingly impeded by "non-tariff barriers" in overseas markets, and proposed the launch of new multilateral negotiations which, among other things, would draw up "codes of conduct" to address non-tariff issues. In seeking congressional negotiating authority in 1973, the US Special Trade Representative, William Eberle, argued that "the forthcoming trade negotiations must differ substantially from those of the past ... The negotiations must cover *all barriers* which distort trade".

The Europeans, for their part, wanted to return to issues that they had unsuccessfully pushed during the Kennedy Round, especially customs valuation (and the removal of the ASP), anti-dumping and government procurement (Winham, 1986). The growing importance of non-tariff measures was further highlighted by a Non-Tariff Measure Inventory that had been compiled by the GATT Secretariat, based on members' reverse notifications, since 1967.

The Tokyo Round gave centre stage to the negotiation of improved and expanded rules on non-tariff measures. In the ministerial declaration launching the Round, a key stated objective was to "reduce or eliminate non-tariff measures or, where this is not appropriate, to reduce or eliminate their trade restricting or distorting effects, and to bring such measures under more effective international discipline". Reflecting this priority, the Trade Negotiations Committee created a special negotiating sub-committee on non-tariff measures in February 1974; this committee was itself divided into sub-groups on quantitative restrictions, technical barriers to trade, customs matters, subsidies and countervailing measures, and (after July 1976) government procurement. The main outcome of their efforts was the negotiation of six new plurilateral agreements – or "codes" – which, with the exception of government procurement, built on existing GATT provisions. Despite their limited membership – for example, just 39 countries, a third of the GATT membership, opted

to sign the Technical Barriers to Trade Code (also referred to as the Standards Code) at the end of the Round – these agreements marked a significant advance in the system's efforts to clarify rules in a number of non-tariff areas.

The Customs Valuation Code brought greater uniformity and standardization to the way that imports were valued. New rules in the Import Licensing Code reduced the scope for discrimination in the way that customs authorities could apply licences. The codes on government procurement and subsidy/countervail were also important breakthroughs in the Tokyo Round – the former because it brought a major new area of economic activity under GATT rules, the latter because it demonstrated the willingness of countries to negotiate on an increasingly high-profile and contentious non-tariff measure (Winham, 1986).

As a clear signal of the way that the fast-expanding array of domestic technical, health and safety non-tariff measures would be addressed by GATT rules in the future, the new Standards Code was arguably one of the most significant and important Tokyo Round results. Not only did the Code explicitly reiterate the GATT's existing non-discrimination obligations regarding the administration of technical regulations, it also obliged countries to adopt existing internationally accepted standards – unless inappropriate for defined reasons – while urging them to work towards the further harmonization of standards. Furthermore, the Code encouraged countries to adopt a "mutual recognition" policy, whenever possible, for test results, certificates and marks of conformity.

Although the Tokyo Round's tariff reduction agreement was significant, the Round's main achievement was the development of a comprehensive regime for non-tariff measures. The Tokyo Round codes were not without weaknesses – some of which were to provide an impetus for launching the Uruguay Round negotiations. Since the codes' membership was limited, they were sometimes accused of not being fully "multilateral", of creating a two-tiered GATT, and of weakening the principle of non-discrimination. The codes' separate committees, provisions and dispute settlement procedures also open them to the charge of "balkanizing" the multilateral trading system. Some of these concerns were addressed in the November 1979 GATT Decision, which affirmed that these agreements (except government procurement) would be applied in a manner fully consistent with most-favoured nation (i.e. non-discrimination), so non-signatories preserved their existing rights.

The Decision also secured the right of non-signatories to participate in the various code committees as observers – addressing a concern of developing countries. Despite these shortcomings, the Tokyo Round clearly marked the most significant advance in the system's efforts to deal with non-tariff measures

since the GATT's rules were first negotiated after the Second World War.

Non-tariff measures remained a main focus of the Uruguay Round – in part to build and expand upon what had been achieved in the Tokyo Round. The 1986 Punta del Este Declaration, launching the Round, provided a broad mandate: “negotiations shall aim to reduce or eliminate non-tariff measures, including quantitative restrictions”. Japan, the first country to formally propose launching the new Round, specifically sought strengthened GATT disciplines on NTMs, especially voluntary export restraints and other managed trade arrangements (Croome, 1996). The United States, for its part, not only sought improved market access for its manufactured and agricultural exports, but expanded opportunities for its increasingly competitive services exports, and to strengthen foreign protection and enforcement of its intellectual property rights – all of which involved a much broader focus on non-tariff measures than had been envisaged in the past.

Like the United States, the European Communities also had an interest in opening up services trade and strengthening intellectual property protection. Meanwhile, a critical mass of developing countries were prepared to contemplate new services and intellectual property rules in exchange for improved access to developed-country markets for their manufactured exports, including by dismantling the Multi-Fibre Arrangement (which had replaced the LTA in 1974), amending the safeguard clause, and generally strengthening the GATT's non-discriminatory rules.

The Uruguay Round marked another major expansion of the system's coverage of non-tariff measures. The widening of multilateral rules to include services trade and intellectual property protection – through the GATS and the Trade-related Aspects of Intellectual Property Rights (TRIPS) Agreement – involved new disciplines across a whole range of measures. However, these were not the only areas where the Uruguay Round expanded international regulation of NTMs.

Agricultural trade had largely been exempted from previous GATT negotiations and the use of non-tariff measures, such import quotas and subsidies, in agricultural policy had enjoyed special status under GATT rules. Under the Uruguay Round's agriculture agreement, however, most remaining non-tariff restrictions were replaced by tariffs – a process known as tariffication – and new commitments were undertaken to discipline domestic support and export subsidies. In addition to improvements to the Technical Barriers to Trade Agreement, a new Sanitary and Phytosanitary Measures Agreement was negotiated dealing specifically with agriculture-related standards. By treating sanitary and phytosanitary (SPS) measures under a separate (and more rigorous) agreement,

negotiators not only acknowledged the growing importance and prominence of food safety issues – and their increasing relevance to agricultural trade – but also the possibility that countries might be tempted to compensate for negotiated tariff and subsidy reductions through increased use of SPS measures (Croome, 1996).

GATT disciplines on import licensing and rules of origin were also strengthened, while existing rules on subsidies – including their classification into prohibited, permissible and possibly permissible subsidies – were expanded. Countries also agreed to dismantle progressively the Multi-Fibre Arrangement, which had evaded GATT rules since 1962, ending one of the most prominent and controversial trade arrangements.

The changing focus and scope of each round of GATT negotiations since 1947 not only reflects the on-going relevance of non-tariff measures to the international trading system, but also how the relative importance of various measures has shifted over time (see Table A.1). Quantitative restrictions were the most pressing problem facing the early GATT negotiators because countries were slow to dismantle wartime controls and Europe was preoccupied with balance-of-payments problems and dollar shortages. However, these gradually diminished in importance during the 1950s as the dollar shortage resolved itself and as import and exchange controls were lifted.

Later, during the Kennedy Round, attention increasingly turned to customs valuation anomalies, anti-dumping actions, and the expansion of trade agreements between countries. Notwithstanding the efforts made to address these issues during the Round, quantitative restrictions and embargoes still accounted for more than a quarter of the non-tariff measures notified in the 1968 inventory and continued to be relevant after the Uruguay Round. Rising trade conflicts over production subsidies and health and safety standards were added to the list of emerging problems during the Tokyo Round (i.e. 6.6 per cent and 9.2 per cent of the measures notified in the 1973 inventory). During the Uruguay Round, discussions on NTMs expanded dramatically to include the host of domestic regulations related to services and intellectual property, in addition to the wide array of agriculture and textile measures that had previously been exempt from GATT rules.

In the current Doha Round, “standards” and “customs and administrative procedures” have re-emerged as the two most important categories of non-tariff measures being addressed in the negotiations on manufactured products (NAMA, or non-agricultural market access) and trade facilitation (at 37.6 per cent and 26.5 per cent respectively, these were among the top three categories of NTMs notified in the 2005 inventory). The fact that the GATT's transit, administrative and transparency provisions (Articles V, VIII and X), largely neglected in

Table A.1: Non-tariff measures notified by GATT/WTO members for non-agricultural products
(share of NTMs by inventory category)

Parts and sections	DESCRIPTION	Inventory (1968) ¹	Inventory (1973) ²	Inventory (1989) ³	NAMA, 1 st Inv. (2003) ⁴	NAMA, 2 nd Inv. (2005) ⁵
Part I	Government participation in trade and restrictive practices tolerated by governments	11.9	15.3	20.9	7.1	7.0
A	Government aids	2.7	6.6	7.3	1.8	1.7
B	Countervailing duties	0.6	0.4	0.5	0.2	0.0
C	Government procurement	3.7	3.4	6.4	0.9	0.7
D	Restrictive practices tolerated by governments	0.0	0.8	2.0	3.8	4.3
E	State trading, government monopoly practices, etc.	4.9	4.1	4.6	0.4	0.3
Part II	Customs and administrative entry procedures	14.8	14.6	11.9	23.5	26.2
A	Anti-dumping duties	1.1	1.5	2.3	1.5	2.3
B	Valuation	5.5	4.8	4.1	2.3	5.3
C	Customs classification	1.3	0.7	0.5	0.7	3.3
D	Consular formalities and documentation	4.7	6.4	3.4	2.3	3.0
E	Samples	0.7	0.4	0.2	0.1	0.0
F	Rules of origin	1.3	0.0	0.4	7.4	2.6
G	Customs formalities	0.2	0.8	1.1	9.1	9.6
Part III	Technical barriers to trade	6.1	9.2	8.2	29.9	37.1
A	General	0.0	9.2	1.6	3.2	8.9
B	Technical regulations and standards	5.2	0.0	3.0	15.8	13.2
C	Testing and certification arrangements	0.9	0.0	3.6	11.0	14.9
Part IV	Specific limitations	36.7	31.5	31.7	34.9	26.8
A	Quantitative restrictions and import licensing	20.7	15.6	13.9	12.8	7.0
B	Embargoes and other restrictions of similar effect	5.0	5.6	5.3	0.8	4.0
C	Screen-time quotas and other mixing regulations	1.9	3.6	1.6	0.0	0.7
D	Exchange control	2.3	1.2	1.2	1.3	1.3
E	Discrimination resulting from bilateral agreements	0.8	1.5	1.1	0.1	0.7
F	Discriminatory sourcing	0.5	1.0	0.0	0.3	1.7
G	Export restraints	1.6	0.4	0.4	0.2	1.0
H	Measures to regulate domestic prices	1.6	0.5	1.2	0.2	0.3
I	Tariff quotas	0.2	0.3	0.5	0.3	1.3
J	Export taxes	0.0	0.0	2.1	0.2	1.0
K	Requirements concerning marking, labelling and packaging	1.6	1.6	2.1	7.2	6.3
L	Other specific limitations	0.3	0.1	2.1	11.5	1.7

Parts and sections	DESCRIPTION	Inventory (1968) ¹	Inventory (1973) ²	Inventory (1989) ³	NAMA, 1 st Inv. (2003) ⁴	NAMA, 2 nd Inv. (2005) ⁵
Part V	Charges on import	29.2	29.4	27.3	4.4	1.7
A	Prior import deposits	1.9	1.9	1.6	0.2	0.0
B	Surcharges, port taxes, statistical taxes, etc.	13.5	10.5	10.5	3.0	1.3
C	Discriminatory film taxes, use taxes, etc.	11.1	4.0	4.5	0.2	0.3
D	Discriminatory credit restrictions	1.3	1.4	1.2	0.2	0.0
E	Border tax adjustments	0.9	11.2	8.6	0.2	0.0
F	Emergency action	0.5	0.4	0.9	0.8	0.0
	Other	1.4	0.0	0.0	0.2	1.3
	Total	100.0	100.0	100.0	100.0	100.0
	Memo: Number of items in the categories	873	731	561	2556	302

Source: Santana and Jackson (2012).

Note: The information presented in this table is largely based on “reverse” notifications according to the inventory categories in document TN/MA/S/5. Because the categories used in each of the inventories differ, several elements had to be adjusted as described below. Where an item corresponded to two or more inventory categories, the item was counted under all the relevant categories. This means that the number of items presented in this table overestimates the actual number of items in the inventory.

¹ Based on the Inventory on Non-Tariff Measures of the Committee on Industrial Products, document COM.IND/6 and Addenda, of 11 December 1968. The categories of this inventory diverge considerably from the ones used for this table. The frequency of measures was grouped and reassigned accordingly. Some of the differences include *inter alia.*: countervailing duties were classified under Part II (customs and administrative procedures) and not under Part I; the “customs classification” of II.B did not exist, but there were categories for “Harmonization of Nomenclature” and “Arbitrary classification”; consular formalities were included under Part II and not in Part I; quantitative restrictions and licensing requirements were presented as two separate items; marking and packaging requirements were classified under Part III (technical barriers to trade); the “restrictive practices tolerated by governments” were included in the “other” category, etc.

² Based on the Note by the Executive Secretariat of the GATT entitled “Inventory of Non-Tariff Measures – Balance sheet of notifications”, document COM.IND/W/102 of 11 April 1973. The inventory categories differ slightly from the ones used in this table. For example, in the 1973 inventory, Part III was entitled “Standards” and was sub-divided into: A) Industrial standards; B) Health and safety standards; C) Other standards concerning product contents; and D) Requirements concerning marking, labelling and packaging; the category of “export taxes” did not exist, etc.

³ Based on the GATT’s Secretariat Analysis of the documentation of the Technical Group on Quantitative Restrictions and other Non-Tariff Measures, GATT Document NTM(TG)/W/5 of 28 February 1989, Annex 10 (QRs) and 12 (NTMs other than QRs).

⁴ The summary is based on the WTO Secretariat’s report JOB(03)/128, which compiled information of notifications in the TN/MA/W/25 series. The second notification exercise notified by members in the TN/MA/W/46 series was not taken into account. Data was processed and rearranged in a manner that would allow for the counting of individual measures as per the inventory categories. Because several measures related to two or more inventory categories were notified, there is an overlap and multiple counting of the same measure. The WTO Secretariat noted in this report that information was often inaccurate or incomplete, to which the authors would add that the manner in which products were grouped also diverged, ranging from grouping of categories of products to identifying tariff lines at the ten-digit level. This summary should, therefore, be interpreted with caution.

⁵ The summary is based on the WTO Secretariat’s report JOB(04)/62/Rev.7, which compiled information of notifications in the TN/MA/W/46 document series. The information notified by Brazil in document TN/MA/W/46/Add.16 was added. The same processing notes of document JOB(03)/128 apply.

previous rounds, are once again in the spotlight through the trade facilitation negotiations demonstrates how enduring the non-tariff measures agenda remains. In short, few of the non-tariff issues on the multilateral trade agenda are completely new or have completely disappeared.

If non-tariff measures are emerging as an even more critical focus of the WTO’s work, it is largely a reflection of the system’s successes, not its failings. The expansion of world trade, the deepening integration of economies, and the widening and strengthening of trade rules have inevitably resulted in non-tariff measures emerging as an increasingly salient feature of the international trade landscape. Declining tariff protection has led some countries to make more creative and extensive use of non-tariff

measures. Many countries, particularly in the developed world, have also expanded health, safety and environmental regulations in recent decades (Trebilcock and Howse, 1999) – whose trade impact is often magnified by cumbersome administrative and compliance procedures (as highlighted in Section C).

Another major reason why non-tariff measures have grown in prominence in the WTO is because the focus on them has increased – as the line between “foreign” and “domestic” issues and policies becomes increasingly blurred.⁹ This development has also increased the complexity of the WTO’s work, since the system has historically found it harder to address NTMs than tariffs. This is partly because they are more complex and country-specific, partly because they do not easily lend themselves to negotiations that have traditionally

focused on the exchange of tariff reductions, but mainly because they can involve domestic policy objectives only indirectly related to trade.

Yet over the decades, the multilateral trading system has developed an increasingly effective means of regulating non-tariff measures – by prohibiting the most protectionist measures, by constraining discriminatory and unnecessarily trade-restrictive

measures, by strengthening general and specific transparency obligations, and by encouraging transnational regulatory cooperation and convergence – building on the GATT's surprisingly adaptable and "modern" foundations. This suggests that the future trade agenda, like the past one, will focus on refining and improving existing disciplines, while taking into account changing contexts as they arise, rather than starting anew in entirely uncharted waters.

Endnotes

- 1 A tariff is "bound" when a WTO member has committed not to raise it above a legally agreed rate (the so-called tariff "binding").
- 2 The GATT's origins were also reflected in the agreement's structure and substantive obligations. Article I sets out the most-favoured nation (MFN) obligation, whereby members agree to apply tariffs on a non-discriminatory basis. Article II covers the tariff reductions schedules to which GATT members had agreed. Together, these two articles comprised Part 1 of the agreement. Part 2 of the GATT, Articles III to XVII, contains almost all of the GATT's other substantive obligations – the most important of which is national treatment (Article III), clearly aimed at preventing NTMs, especially domestic tax and regulatory policies, from being used as protectionist measures that would defeat the purpose of tariff bindings. In addition to national treatment, Part 2 also contains rules governing other NTMs, such as anti-dumping and countervailing duties, customs valuation, customs administration, rules of origin, quantitative restrictions and subsidies.
- 3 As Clair Wilcox, one of the US chief negotiators in Geneva, put it: "Quantitative restrictions ... impose rigid limits on the volumes of trade. They insulate domestic prices and production against changing requirements of the world economy. They freeze trade into established channels. They are likely to be discriminatory in purpose and effect. They give the guidance to public officials; they cannot be divorced from politics. They require public allocation of imports and exports among private traders and necessitate increasing regulation of domestic business. Quantitative restrictions are among the most effective methods that have been devised for the purpose of restricting trade" (Wilcox, 1949).
- 4 The parting South African delegate to the Geneva GATT drafting session in the summer of 1947 observed that "of all the vague and woolly punitive provisions that one could make, [nullification and impairment] seems to me to hold the prize. It appears to me that what it says is this: In this wide world of sin there are certain sins which we have not yet discovered and which after long examination we cannot define; but there being such sins, we will provide some sort of punishment for them if we find out what they are and if we find anybody committing them" (Hudec, 1975).
- 5 Post-war trade relations were dominated by the scarcity of convertible currencies that countries (with the notable exception of the United States) experienced as a consequence of wartime disruptions and the costs of reconstruction. Most European countries had extensive systems of exchange and import controls in place until after the Korean War, when the dollar shortage diminished and countries slowly began to dismantle these systems (Gardner, 1956).
- 6 A list of possible non-tariff measures to be considered for negotiation was prepared by the GATT Secretariat from its Non-Tariff Measures Inventory. Some 150 of the 900 measures notified to the Inventory were in the area of standards.
- 7 See *Analysis of United States Negotiations, 1960-61 Tariff Conference*, Department of State publication 7349, p.203 (Evans, 1971).
- 8 Article VI of the GATT had allowed members to impose anti-dumping duties to offset the margin of dumped goods (provided they caused or threatened to cause "material injury" to domestic industry), but there were growing concerns that the ways that anti-dumping procedures were applied (delays, the injury test, calculations of margins, etc.) could serve as a hidden restriction on trade.
- 9 There is evidence, however, that non-tariff measures, such as trade remedy actions and other less conventional measures, increased after the "trade collapse" that followed the 2008 financial crisis (Gregory et al., 2010).

B. An economic perspective on the use of non-tariff measures

Governments use non-tariff measures and services measures for a growing number of reasons. This section examines what these are and how they may affect trade. It also analyses the choices available to governments among a variety of policy instruments, from a theoretical and an empirical perspective. The section ends with case studies on non-tariff measures in the context of the recent financial crisis, climate change and food safety.

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Some key facts and findings

- Non-tariff measures (NTMs) are often first-best policies to correct market failures. However, as the same NTM used to pursue a public policy objective may also be employed to distort international trade, it can be difficult to distinguish “legitimate” from protectionist motivations for NTMs.
- Neither the declared aim of a non-tariff measure nor its effect on trade provides conclusive evidence of whether it is innocuous from a trade perspective. However, analysing the nature of these measures – their opaqueness, efficiency and effect on various groups in society – and their political and economic context can provide important insights.
- Non-tariff measures, including behind-the-border measures, may take the place of tariffs and border NTMs that are disciplined in trade agreements. This raises important questions regarding the regulation of NTMs at international level.
- Similar issues arise in relation to services measures, which have become increasingly significant in light of the international fragmentation of production processes.
- Developments such as the recent financial crisis, current debates on climate change and heightened concerns about food safety have led to the increased use of NTMs and services measures in the 21st century, illustrating the difficulties involved in dealing with public policy measures and their impact on international trade.

Trade agreements are meant to discipline policies that distort trade without constraining governments in their pursuit of other legitimate public policy objectives, such as consumer health and safety protection – even if these happen to affect trade. Thus, while certain non-tariff measures (NTMs) entail trade costs, these costs can be justified for other reasons. This section seeks to shed light on the importance of making this distinction and on how it can be made, a key question from the perspective of the WTO.

Section B.1 introduces different types of non-tariff measures and discusses how they are employed to achieve a range of policy objectives. In analysing the welfare and trade effects of NTMs in more detail, it becomes clear that usually more than one measure can be used to pursue a given policy goal, in a more or less efficient manner. While a specific NTM can represent the first-best policy to pursue a legitimate public policy objective, the same measure can also be used for protectionist purposes or create unnecessary trade costs. Making this distinction is not always easy and represents a major challenge for trade agreements that target the latter, while seeking not to interfere with the former.

Section B.2 identifies situations in which governments may be prone to employ non-tariff measures for trade competitiveness reasons, even if the stated policy rationale is a different one, or implement an inefficient instrument that may affect trade more than necessary to achieve a given objective. From this analysis, a number of factors relating to the choice of NTMs and the sectors and political context in which they are applied can help distinguish between “legitimate” and “protectionist” (or excessively trade-restrictive) use. Another reason why governments may turn to NTMs relates to “policy substitution” – that is, the use of certain NTMs when tariffs or other NTMs are effectively regulated in international trade agreements.

The special characteristics of services trade, notably the intangibility of services and the different modes of trade, make it necessary to ask, in Section B.3, to what extent the previous analysis applies to services as well.

The penultimate part (Section B.4) examines case studies on the rise of non-tariff measures during the recent financial crisis, in the context of climate change and in relation to food safety. The objective of this sub-section is to illustrate how recent developments have led to an increased use of NTMs and to what extent the measures taken may pose a challenge for international trade. Finally, the main results are summarized in Section B.5.

1. Reasons for government intervention and types of measures

(a) Classifying NTMs and government motives

There are various ways to categorize both non-tariff measures and the reasons why governments use them. The classifications discussed in this section provide a useful way to consider many of the issues raised in this report.

The trade literature typically distinguishes between interventions aimed at increasing national welfare and those motivated by “political economy” goals. The former includes interventions to correct market failures and to exploit a country’s or a firm’s market power (by manipulating the terms of trade and shifting profits). One key point is that interventions to exploit market power come at the expense of one’s trade partners (beggar-thy-neighbour practices), whereas those focused on correcting market failures have trade effects that are unintended consequences of the policy.

Political economy motives reflect the response of political incumbents to special interest groups, usually assumed to be organized producer groups. Although the economic literature generally assumes consumers are too numerous and diverse to coordinate effectively, they can put effective pressure on politicians on issues that involve consumer health and safety. In addition, civil society and non-governmental organizations have become powerful advocates for issues such as the environment. Political economy motives are likely to lead to policies that shelter favoured producers and reduce trade flows at the expense of national welfare. This suggests a further distinction between non-tariff measures motivated by public policy objectives and those motivated by competitiveness concerns. This does not mean that public policy and competitiveness concerns cannot overlap – for example, when protecting an infant industry whose expansion can increase national welfare. However, there are likely to be many more instances where promoting a domestic producer’s interests comes at the expense of the social good. Lastly, motives can be distinguished according to their intended distributional effects – specifically, whether they benefit consumers or producers.

So far, the discussion has focused on the economic motives of governments for employing non-tariff measures. However, national welfare and public policy objectives may embrace far more than purely economic issues. Governments are responsible for safeguarding national security. Governments may wish to firmly uphold certain moral and religious tenets. Where a society is made up of different ethnic or religious groups, a high value will be placed upon the

preservation of social cohesion. These goals may be compromised if certain goods are freely available in the country, requiring governments to use NTMs so as to restrict their supply via international trade.

The classification and quantification of non-tariff measures is a long-standing area of research (a partial listing includes Baldwin, 1970; Laird and Yeats, 1990; Deardorff and Stern, 1997; Dee and Ferrantino, 2005). This research has provided the conceptual framework for the various NTM databases – including the WTO's – that will be relied on extensively in this report, especially in Section C.

Following Staiger (2012), non-tariff measures can be classified according to whether they are applied at the border, to exports (e.g. export taxes, quotas or bans) and imports (e.g. import quota, import ban), or behind the border. This latter category can be further subdivided according to whether the NTMs are domestic taxes, other charges, and subsidies, or whether they are regulatory. The distinction between border and behind-the-border NTMs appears frequently in the economic literature. In one sense, it is a distinction based on where the measures are applied. However, in another sense, it involves a distinction between measures applied to foreign goods only (at the border) and those applied equally to domestic and foreign goods. This raises a key question about behind-the-border measures – i.e. whether, intentionally or *de facto*, they treat domestic and foreign goods differently.

What is common about the interventions collectively called non-tariff measures, irrespective of their

motives, is that they have trade effects (either liberal or restrictive). Sometimes the trade effects are simply the by-product of pursuing a particular public policy objective. Other times, the trade effects are the primary goal. Since governments usually claim that their policies have laudable objectives, declared intentions may offer little insight into the motives behind interventions. Instead, motives can best be deduced from the type of NTM chosen, from the sector to which it is applied, from its design and implementation, and from its impact – i.e. whether consumers or producers benefit and whether foreign goods are discriminated against or not.

For the purpose of later analysis of the trade and welfare effects of non-tariff measures, a distinction will also be made between NTMs that are price, quantity or “quality” focused. A price measure (such as a subsidy) operates by changing relative prices while a quantity measure (such as a quota) works by directly limiting the quantity of some activity. Quality measures (such as a technical barrier to trade measure or a sanitary and phytosanitary measure) change some features of a product or the process by which it is produced. This categorization helps to simplify the analysis of the trade and welfare effects of NTMs by using examples taken from each category rather than by examining exhaustively all NTMs.

Another important theme in the literature – and in this report – is the transparency of non-tariff measures. Although there is no agreed definition of what constitutes a transparent NTM, Box B.1 discusses how the issue might be approached and conceptualized.

Box B.1: Defining transparency in non-tariff measures

Criteria for assessing the transparency of non-tariff measures are not readily available in the trade literature, so the following analysis draws on several papers that address public policy transparency more broadly. These include Geraats (2002) which defines transparency in central banking and in the conduct of monetary policy, Wolfe (2003) which discusses transparency requirements found in WTO agreements, Collins-Williams and Wolfe (2010) which develops what the authors describe as an “analytic framework” for thinking about WTO transparency provisions and Helble et al. (2009) which discusses the transparency of the trading environment and concludes that it exerts an independent impact on trade flows.¹ None provide a definition of transparency that can be taken “off-the-shelf” and applied directly to NTMs. However, the papers do provide a number of useful ideas for approaching the task of assessing the transparency of NTMs.

First, at a conceptual level, transparency can be defined as the absence of information asymmetry, a situation where policy makers and relevant economic agents have the same information (Geraats, 2002). Information asymmetry generates uncertainty for the agents with less information. Those with access to private information may try to manipulate the beliefs of others and thereby indirectly alter economic behaviour. Thus, economic efficiency requires information be made publicly available. In the case of non-tariff measures, it may be important to distinguish between different economic agents – the private sector and other governments – because each is likely to be concerned with different aspects of information. Governments are likely to want information that allows them to better evaluate whether their trade partners are abiding by international commitments. The private sector is likely to be more concerned with information asymmetry that hampers its ability to take advantage of commercially profitable opportunities.

Secondly, given the range and diversity of non-tariff measures, removing information asymmetry may require devoting more effort to some measures than others.

Regulations involving human health, food safety or the environment usually require specialized knowledge and will be intrinsically more complex than an *ad valorem* tariff. As Collins-Williams and Wolfe (2010) put it, trading partners cannot see what is going on “behind the border” without help. This means that mechanisms to achieve regulatory transparency may have to be designed or structured differently than other types of non-tariff measures given their greater complexity.

Thirdly, a more systemic view of transparency is needed which takes into account the policy-making process as a whole. One of the key difficulties is distinguishing whether a non-tariff measure is put in place because of public policy concerns or a desire to protect domestic producers. It is much easier to resolve this question if one has knowledge of the decision- or policy-making process as a whole, and is not limited to drawing inferences solely from the NTM's design or its implementation.

Fourthly, in this connection, it may be possible to take the stages of policy-making identified in Geraats (2002) and adapt them to a trade or NTM context. The paper distinguishes between different stages of the policy-making process – political, economic, procedural, policy and operational – and makes the point that transparency will need to apply to each of these stages and that it may call for different requirements at each stage.² In the NTM context, political transparency refers to openness about policy objectives and the importance assigned to them. Scientific or technical transparency means making available the information used as the basis for implementing a measure, including the underlying data, expert opinion and risk assessment. Procedural transparency describes the way policy decisions are taken, including the scope for public consultations and access to independent adjudication. It also includes the publication and notification of measures and the establishment of enquiry points. Operational transparency concerns the design and implementation of the NTM. By comparing the transparency of NTMs in this “systemic” way, the whole policy-making process could be taken into account, or just one particular stage of it.

Fifthly, the papers by Helble et al. (2009) and Wolfe (2003) associate transparency with predictability and simplicity. Predictability reduces the cost stemming from policy uncertainty while simplification reduces the information costs from an overly complex trading environment that may hinder economic agents. A “bound” import tariff is more transparent than an unbound tariff because the tariff binding creates greater predictability for exporters to that country. These papers suggest that predictability and simplicity are important dimensions of transparency and provide another way of comparing the transparency of different non-tariff measures. At the operational stage for example, the transparency of an NTM may be judged by whether traders find its design or implementation to be simple and predictable.

Finally, an unstated assumption in all these papers is that aggregate welfare should increase with enhanced transparency. While this is likely to be the case, not everyone would necessarily be better off if trade partners become more transparent with one another. Some import-competing firms may lose out if, as a result of greater transparency of the home country's non-tariff measures, foreign competitors export more because of the reduction in uncertainty. As will be explained in Section B.2, some policy-makers may have no interest in transparency because opaqueness allows them to reward political backers without paying a political price. This may explain why introducing more transparency in NTMs is likely to be a difficult undertaking, not necessarily because of the technical challenges involved, but because there are interests that will be opposed to it.

Any discussion of the motives and impacts of non-tariff measures needs to take into account the increasing fragmentation and offshoring of production. Unfortunately, there is very little literature about how fragmentation affects government motives to employ NTMs so what can be said is rather limited and conjectural.

The international fragmentation of production across many parts of the world is well documented in recent empirical research. Hanson et al. (2005) illustrate the extent of US multinationals' trade in intermediate inputs between parent firms and their foreign affiliates. Hummels et al. (2001) demonstrate the degree of vertical specialization among ten OECD and four emerging countries. Kimura and Ando (2005) show

the extent of international production/distribution networks in East Asia. Theoretical research into the fragmentation of production has also grown in tandem with this expanding empirical work (see the recent survey by Baldwin and Robert-Nicoud, 2007).

The economic theory of fragmentation (Jones and Kierzkowski, 1990; 2000) contends that increased market size makes it profitable to split up the process of production and allow specialization to reduce per unit cost.³ This division of labour can take place within a country, but if countries differ in their comparative advantages, greater cost savings from specialization can be obtained by offshoring production. This process of fragmentation requires firms to be able to coordinate between production locations and to move parts and

components across national borders. This underscores the crucial role of services, particularly telecommunications and transport, in connecting fragmented production blocks.

Production fragmentation has an impact on why governments use non-tariff measures and how they influence trade. First, where global supply chains are prevalent, it is not possible to disentangle merchandise trade from services trade and foreign direct investment (FDI). This means that NTMs, which affect merchandise trade, are also likely to have an impact on services and FDI flows. Conversely, services and investment regulations are likely to impact merchandise trade as well. Secondly, while governments' usual motives for employing NTMs remain – i.e. to address market failures, to exploit market power or to respond to political economy pressures – production fragmentation makes some motives more pressing than others. For instance, governments may see information asymmetry as more critical given that products are now made from parts and components coming from distant and multiple sources (see the case study of food supply chains in Section B.4). Clearly, the role of NTMs in a world of increasingly fragmented production is a fertile area for future research.

(b) How do non-tariff measures achieve policy objectives?

The discussion here illustrates how non-tariff measures can be used to achieve public policy as well as political economy objectives. Although it is not an exhaustive discussion of all possible government motives for using NTMs, two broader observations can be made. First, more than one NTM can frequently be used to pursue the same policy objective. From the

standpoint of economic efficiency, governments should use the NTM that maximizes national welfare – i.e. the first-best NTM (see Box B.2 which discusses how this decision-making process is akin to cost-benefit analysis). Secondly, NTMs used to pursue legitimate policy objectives can also be used for protectionist purposes, underlining the difficulty of distinguishing “legitimate” from “protectionist” government motives. This section begins with several cases of market failures, looks at instances of beggar-thy-neighbour policies, touches on equity motivations, and ends with political economy examples.

(i) *Correcting market failures*

Health and safety of consumers and consumer choice

As discussed in Box B.1, information asymmetry refers to a situation where one set of agents involved in an economic transaction or exchange has an informational advantage over other parties. An example is the seller of a used car who has better information about the state of the car than the potential buyer (Akerlof, 1970). Another example is the job seeker who has better information about his productivity and aptitude for work than the potential employer (Spence, 1973). A third example is the case of a producer who sells a sub-standard product which can compromise the health and safety of unwitting consumers.

The existence of information asymmetry can lead to a number of inefficiencies in the market. In the used car example, since buyers know that they are at an information disadvantage they will only be willing to bid a low price – with the result that owners of good-quality used cars do not bother to put their cars up for sale, and the used car market ends up being

Box B.2: Choice of NTMs and cost-benefit analysis

There are a number of methods that governments can follow in choosing non-tariff measures. Trachtman (2008) provides a relatively comprehensive listing of these methods (e.g. balancing, means-ends rationality, proportionality). The economically coherent way to think about government intervention and the choice of NTMs is in the context of a cost-benefit analysis (Bown and Trachtman, 2009). In broad terms, a cost-benefit analysis involves calculating the net gains to national welfare by implementing one measure relative to an alternative. (Note that the Bown and Trachtman paper goes one step further than this by including the change in the welfare of the trade partner as well because they are concerned with global and not just national welfare.)

The presumption is that non-tariff measures will vary in their ability to achieve the policy goal and that they will also differ in their costs. Governments will therefore need to evaluate the benefit from achieving a given policy objective (e.g. the welfare gain from reducing pollution), the contribution that a particular NTM can make to achieving the policy goal, and the cost incurred in applying the NTM. The outcome of the cost-benefit analysis determines not only whether government intervention is called for in the first place (the benefit must exceed the cost) but also provides a ranking of the NTMs. In particular, the method should be able to identify the first-best measure – that which produces the largest differential in benefit over cost. It is likely that a cost-benefit analysis would be more information-intensive and technically challenging to apply than some of the simpler methods mentioned above. Benefits and costs need to be quantified and monetary values assigned to them. Informational and resource constraints may explain, at least partly, why some governments do not make more extensive use of cost-benefit analysis in decision-making on NTMs.

overwhelmed by low-quality cars, i.e. there is adverse selection. In the job-seeking example, information asymmetry may lead the job seeker to expend resources to “signal” his productivity to the potential employer (e.g. attend a more expensive school) even though that decision will not necessarily increase his productivity. In the case of the sub-standard product, sale of the product can cause injuries or even fatalities. As these examples show, markets will not necessarily deliver the most efficient outcomes, and this failure provides a rationale for public action. This explains, for example, why a wide range of consumer goods – food, drugs, vehicles, electrical appliances, safety equipment – face many types of requirements, from design (e.g. toys) to ingredients (e.g. chemicals) to the process of manufacture or production (e.g. pasteurization of milk) and to performance (e.g. helmets) (World Trade Organization (WTO), 2005a). What these measures are designed to do is to weed out those products, whether domestic or foreign, that will compromise the health or safety of consumers.

Information asymmetry is also relevant to international trade. Suppose that countries differ in the safety or quality of the goods that they produce, with the home country specializing in high-quality products and the foreign country specializing in low-quality ones. Imagine that consumers in both countries differ in their preference for quality, with some willing to pay more for high-quality products, and others unwilling to pay more. In this scenario, consumers are also unable to tell the difference between high-quality and low-quality products because these goods are not distinguished by origin. Under these circumstances, Bond (1984) shows that the country with high-quality products may lose if it trades with the country producing low-quality products. This arises because trade reduces the average quality of products sold in the market of the high-quality producing country, which spills over to affect the expected welfare of all consumers in the importing country.

The first-best policy is labelling to allow consumers to distinguish between home (high-quality) and foreign (low-quality) products.⁴ Consumers with a taste for high-quality goods will purchase home goods and consumers satisfied with low-quality goods will purchase foreign goods, resulting in a two-way trade in equilibrium. Each product will sell for the “right” price – high-quality goods at higher prices and low-quality goods at lower prices. The ability to distinguish between home and foreign products leaves both countries better off as a result of trade because it expands the variety of products available to consumers, and leads to a better match between consumer tastes and products. A similar result is established in Pienaar (2005) where requiring foreign goods to be labelled according to their country of origin gives the consumer all the necessary information, and unambiguously improves the welfare of the importing country.

Under certain circumstances, export subsidies can also help reduce or eliminate information asymmetry (Bagwell and Staiger, 1989). Consumers in the importing country differ in their taste for quality. Some consumers like high-quality goods and are willing to pay a higher price for them; others would rather pay a lower price for the low-quality good. Unfortunately, the groups are unable to tell the difference between high-quality and low-quality products until they make the purchase, i.e. these are “experience goods” (Nelson, 1970).⁵

Producers in the exporting country, who make the high-quality product, incur a higher cost of production than producers in the importing country, who make the low-quality good. If both goods circulate in the importing country, consumers will be unable to tell the difference and the price will reflect the average quality of these goods. At such a price, high-quality producers will not be able to export their goods since it will not cover their cost of production.⁶ If the high-quality firms are aided by an export subsidy, they can sell their goods at the average price and still earn a profit. Having been introduced to the high-quality product, consumers preferring high-quality goods will be able to make repeat purchases, paying a price that reflects the quality of the good. At this later stage, the high-quality producer receives a price that covers his cost of production, and the government can withdraw the export subsidies. Consumers satisfied with low-quality goods benefit as well since they can now identify these goods and pay a lower price for them.⁷

Pollution and the environment

Another type of market failure that can justify government action is a negative externality such as pollution. Negative externalities arise when an agent's economic activity generates costs to others that the agent does not fully absorb. Hence, the scale of his activity exceeds the socially optimal amount. In recent decades, the public and policy-makers have become increasingly aware of the environmental consequences of certain economic activities. Much of the economic literature focuses on the use of taxes to correct negative externalities – the so-called Pigouvian tax. Nevertheless, many governments have chosen to pursue environmental objectives using non-price measures, such as performance standards, emission quotas, and mandated technologies.⁸

One drawback of trying to reduce pollution through government-mandated technologies is that the incentive to find less costly ways to achieve the same environmental objective is removed. Nevertheless, governments may prefer these measures for distributional or competitive reasons, because of uncertainty about the costs and benefits of abatement, or to avoid the cost of monitoring and enforcement (Bovenberg and Goulder, 2002). Regarding distributional or competitiveness concerns, for

example, governments may be sensitive to the fact that a pollution tax requires firms to pay for each unit of emission while an emission quota does not. While both instruments might lead the firm to curtail emissions by the same amount, the tax saddles the firm with an additional liability that it does not face with a quota. If policy-makers are uncertain about the true cost of mitigating environmental damage, but are certain that passing beyond a threshold level of environmental damage would be catastrophic, quantity-based measures will be preferred to price-based measures.⁹

Some of the more complicated and contentious environmental issues involve cross-border externalities. One type of cross-border externality involves countries whose economic activity pollutes or reduces a common resource, damaging all countries. A notable example of this is global warming (see the discussion in Section B.4). Another type of cross-border externality is where the activity occurs in one jurisdiction, but the adverse impacts are partly or fully felt in another jurisdiction.

Cross-border externalities are often compounded by differences in countries' income levels, or institutional and environmental capacities. Since adopting environment-friendly production methods often entails higher costs, this can lead to disagreements between countries about the distribution of the costs and benefits of correcting the externality. A number of GATT/WTO disputes – tuna-dolphin¹⁰ and shrimp-turtle¹¹ – appear to fall within this category. While such differences make it difficult for countries to reach an agreement, markets could play a role in mitigating or eliminating a cross-border externality. Assuming that credible information about the environmental costs of producing a good were available, consumers might be willing to pay more for the product if it was produced without causing environmental harm. Higher prices would provide an incentive for producers to switch to more environment-friendly methods, thereby reducing pressure on the environment.

However, products made by environmentally-friendly processes may not be distinguishable from those made by less environmentally-friendly processes. Tuna caught by fishing methods which leave dolphins unharmed tastes the same as tuna caught by methods lethal to dolphins. This introduces a second market failure – information asymmetry (see discussion above) – to the original problem of a cross-border externality. Beaulieu and Gaisford (2002) analyse the effects of attempting to address these problems through various non-tariff measures – from outright bans to labelling.

Given the existence of market failures, open trade is not necessarily optimal. Depending on the strength of consumer preferences for the environment-friendly good, an outright ban of imports from countries that are the source of the environmental externality may be

even better than open trade. The rationale is that a ban improves consumer confidence in the products since they know that only environment-friendly goods can be sold. This leads to an increase in demand, i.e. a shift in the demand curve, and to greater consumer surplus. For the importing country, the drawback of an import ban is that some consumers may be indifferent to environment-friendly and environment-unfriendly products, and unwilling to pay a premium for the former. The ban adversely affects them since it limits their choice to the expensive, environment-friendly good.

While there are good reasons to question the advantages of import bans, there are notable examples of products whose trade the international community has banned for environmental reasons, including endangered species (banned under the Convention on International Trade in Endangered Species of Wild Fauna and Flora) and ozone-depleting substances (banned under the Montreal Protocol).¹² Of course, consumer confidence can also be enhanced by a labelling scheme that correctly distinguishes between goods made with little or no harm to the environment and those that impose an environmental cost. Effective labelling would be superior to a ban since it improves consumer confidence without artificially restricting imports. Consumers unwilling to pay a premium for the environment-friendly good are still able to purchase their preferred (low-price) environmentally-unfriendly good.

Infant industry protection

In some cases, an agent's economic activity generates benefits for others that the agent does not fully capture. These "positive externalities" represent an important class of market failure that can justify public intervention since the scale of activity is less than the socially optimal amount. One example is infant industry protection.

Suppose the conditions for supporting an infant industry exist.¹³ The home country has a high-cost industry that finds it difficult to compete with foreign goods, but there are dynamic learning effects that are external to the firm and beneficial to the country. The experience that domestic firms accumulate by producing the good will reduce their costs over time. Furthermore, these learning effects cannot be contained within the firm but are also of benefit to other firms in the industry. This spill-over effect means that a firm does not fully internalize the gains from its learning, and so the prospect of later profit may not be sufficiently attractive to warrant absorbing losses during the initial learning period. This situation provides the necessary justification for extending temporary government support to the industry. Under these conditions, the first-best solution is for governments to use a production subsidy rather than a tariff to assist the infant industry (Bhagwati and

Ramaswami, 1963). It directly targets the source of the market failure by supporting learning in the domestic industry without penalizing consumers with a higher price for the product, the principal drawback of using a tariff.

Ideally, the support extended to the infant industry should decline as learning takes place. However, information about the pace of learning may not be known with certainty by the policy-maker. Applying a fixed subsidy rate means that the protection extended to the infant industry will be below the optimum level at the start of the learning period and too high at the end. Under these circumstances, Melitz (2005) proposes using a quota instead of a subsidy, noting that it will allow the level of infant-industry protection to adjust automatically as the industry's costs decline.¹⁴ Over time, the quota will become less distortive as the domestic industry's competitiveness improves.

Network effects/externalities

Certain products or services are more valuable to a buyer when more consumers use the same product or service. For example, the greater the number of subscribers to a telephone system, the more valuable that network will be to potential subscribers. Likewise, Facebook, Twitter or LinkedIn accounts are more valuable the more "friends", "followers", or professional contacts are drawn into these social networking sites. Such products or services are subject to what have been called "network effects/externalities" (Katz and Shapiro, 1985).¹⁵

Potentially there is a market failure associated with these networks. An individual decides to join a network because of the benefits he or she will obtain, not because of the benefits existing members will derive from him or her joining. As a result, the size of the network is smaller than the socially desirable size. If there are competing networks, each one of which is owned by a different firm, one way the problem of network size can be resolved is by making them compatible so that clients of one network are connected to the clients of all other networks (Katz and Shapiro, 1986). Given that each user's utility increases as the size of the network expands, compatibility among networks increases social welfare.

Compatibility can be achieved through adoption of common standards. The key question is whether firms have enough incentives to develop compatibility standards on their own without government intervention. One reason to be sceptical of government intervention is that governments are unlikely to have a significant informational advantage relative to private parties when emerging technologies are concerned, and so cannot be presumed to know which standard is the optimal one (Katz and Shapiro, 1994). On the other hand, because of the network effects, a product's compatibility increases its value to consumers who will

then be willing to pay more for it than for a competing but incompatible product. There may also be a market-mediated effect, as when a complementary good (spare parts, servicing, software) becomes cheaper and more readily available the greater the compatibility of markets (Farrell and Saloner, 1985). Based on evidence from the United States, these incentives appear to be sufficiently large to induce a number of private institutions – from lumber companies to Local Area Networks – to get involved in standardization activity (Farrell and Saloner, 1988). Box B.3 provides other examples of the development and use of private standards by industry groups.

Monopoly power

Imperfect competition represents another instance of market failure which occasions various forms of government intervention. Typically though, such measures are directed at the behaviour of firms and not at the products or services they produce. Competition rules will prevent a firm from colluding with others, limit its merger and acquisition activity, and guard against abuse of a dominant position.

A specific example illustrates the role of non-tariff measures in addressing this particular market failure. A small country is only able to source a specific product from a foreign monopolist because it is not produced domestically. The importing government's objective is to expand imports and reduce the artificial scarcity resulting from the foreign monopolist's control of the domestic market. Instead of NTMs being used to restrict trade, in this case NTMs will be used to try to expand trade and/or reduce the price charged by the monopolist. The optimal policy is a price ceiling on the imported product set equal to the monopolist's marginal cost of production (Helpman and Krugman, 1989). In other words, the foreign monopolist will be allowed to sell to the home country only if it caps its price at the ceiling established by the importing country. (If the monopolist had been a domestic firm, a competition authority would have adopted a similar policy of marginal-cost pricing.) More elaborate examples are discussed in Helpman and Krugman (1989) involving the use of other NTMs, such as import subsidies and minimum import volume requirements, to induce foreign firms with market power to supply more to the importing country.

(ii) *Beggar-thy-neighbour policies*

A country with market power in international trade can increase national welfare by improving its terms of trade (the ratio of export to import prices). If firms competing in international trade have market power – so that one firm's actions have an effect on the profits of its rival(s) – then government actions can shift profits from the foreign firm to the home firm, resulting in a gain in national welfare. In both instances, non-tariff measures can be used by the home country to

Box B.3: Network effects/externalities and private standards

Where network effects/externalities exist, private standard-setting is a common outcome. Indeed, compatibility and integration are paramount to exploit such externalities. The following two examples illustrate the huge incentive to develop and implement private standards in industries characterized by network externalities.

One example is e-business. The Internet has become an increasingly important commercial marketplace in recent decades, thanks to mass Internet connectivity, and the expansion of web browsers and interactive web sites (Pant and Ravichandran, 2001).

It is reasonable to assume that the value of an e-business information system increases with the number of people, IT products, and networks interacting through it – and in general, systems of e-business that construct global communities of customers, suppliers and business partners achieve a higher value (Pant and Ravichandran, 2001). However, in order to function and to provide customers with timely information about products, e-business systems need to be integrated with companies' internal systems and suppliers' information systems. Such integration can be effectively achieved through standardization activities (Chen, 2003). E-business standards allow a specification of business objects, data and processes involved in web-based commerce. Therefore, their adoption represents a step towards compatibility and inter-operability among companies, generating an enhanced value for the firms involved and the industry as a whole (Zhao et al., 2007).

Electronic card payments (Electronic Funds Transfer at Point of Sale or "EFTPOS") provide a second example of the incentive to develop standards in contexts characterized by network externalities (Guibourg, 2001). In the last decades, the EFTPOS market has developed in many industrialized countries, evolving from paper-based instruments to debit and credit card payments. Usually, these payments are used for face-to-face transactions, and represent more efficient alternatives to cash as they allow a reduction in both costs and risks related to such payments. Network externalities are evident in this context. The usefulness to the cardholder increases as the acceptance of the card as a means of payment grows broader and the number of compatible terminals increases.

In order for electronic payments to take place, and for network externalities to come to full realization, some conditions must apply. Complementarities between users need to be in place. Indeed, the utility of an individual in an EFTPOS market is zero if no retailer accepts electronic payments. However, the presence of complementarities is not a wholly sufficient condition. For network externalities to play a role, compatibility among products is also crucial. The final transfer is based on an exchange of information to authenticate and authorize the payment, and retailers need to own a terminal that allows communication with the customer's bank which in turn authorizes the transfer. This requires a telecommunications infrastructure that connects the retailer's terminal with both the retailer's and the customer's bank. Inter-operability is therefore paramount to exploit network externalities, and it can be achieved through common rules, operational standards and formats (Guibourg, 2001).

pocket terms-of-trade and profit-shifting gains. These welfare gains will come at the expense of other countries – i.e. these are beggar-thy-neighbour policies. Unlike the motives discussed before, where the trade effects may be unintended consequences of the policy, in this instance the trade effects are the intended aim of the policy. They are the means by which the country appropriates gains at the expense of its partner.

Manipulating the terms of trade with NTMs

Much of the literature on how the terms of trade can be shifted by trade policy has focused on the role of import tariffs (Johnson, 1954, Mayer, 1981; Bagwell and Staiger, 1999). An import tariff reduces the demand for imports, so for a large country this will have the effect of reducing the world price of its imports relative to the price for its exports. However,

an export tax can have a similar effect on a large country's terms of trade since the reduced availability of a country's export good in world markets should lead to a rise in its price relative to the import product.¹⁶ It turns out that an export subsidy can also shift the terms of trade in favour of the exporting country provided that it has another good that it exports and there are differences in consumption patterns between the importing and exporting countries (Feenstra, 1986).¹⁷

If a country is not constrained in its use of these measures, such as by international agreements, they would be widely used to manipulate the terms of trade. Regulatory instruments, such as technical barriers to trade (TBT) and sanitary and phytosanitary (SPS) measures, would be used to correct market failures and would be set at their socially optimal levels (Bagwell and Staiger, 2001; Staiger and Sykes, 2011).

However, this result may not necessarily hold in a world where production is increasingly offshored and international trade flows are dominated by intermediate inputs, many of which appear to be highly specialized to their intended use (Staiger, 2012). Section B.2 will provide a more detailed discussion of this result.

Profit-shifting non-tariff measures

Non-tariff measures can also be used to shift profits from the foreign to the home country. This is most relevant in imperfectly competitive markets where firms have market power, and can effectively use NTMs, such as subsidies, export taxes and TBT/SPS measures, to take market share and profits away from foreign rivals.

Suppose that two firms, the home and foreign firm, compete in selling to a third market. Competition between them can take many forms but for the purpose of this discussion two types of competition are examined – through their choice of output (Cournot competition) or through their choice of price (Bertrand competition).

Under Cournot competition, Brander and Spencer (1985) demonstrate that a government can use export subsidies to help the home firm expand output, thereby forcing its foreign rival to contract production and concede market share. The subsidy has the effect of committing the domestic firm to a more aggressive strategy which in turn induces the foreign firm to produce less.¹⁸ From the point of view of the home country, even though the subsidy payment is just a transfer from the government to the home firm, the profit-shifting effect results in the firm's profit rising by more than the amount of the subsidy, creating a net gain to the home country. Note that the export subsidy creates a terms-of-trade loss for the domestic country, but this is more than made up for by the profit-shifting effect of the policy (Brander, 1995).

If firms compete in prices, Eaton and Grossman (1986) show that the optimal policy will be an export tax rather than an export subsidy. Under Bertrand competition, both firms would like to charge a higher price but if only one firm does so it will face lower export demand. However, a price hike would not prove detrimental to the home firm if its rival follows with a price increase of its own. Both firms will earn positive profits as a result. By imposing an export tax on its firm, the home government in effect commits the home firm to charge a higher price for any given price chosen by the rival. This persuades the foreign firm to follow suit – match the home firm's higher price – which benefits it and the home firm as well.¹⁹

Domestic subsidies in the form of research and development (R&D) subsidies can also be used to shift profits from foreign rivals to domestic firms. This policy turns out to be optimal regardless of whether firms

engage in Bertrand or Cournot competition. Basically, the R&D subsidy provides an incentive to the home firm to increase its R&D investments, thereby generating cost-reducing innovation.²⁰ If the foreign firm is not subsidized in turn by its government, only a small level of R&D spending will be optimal with unfavourable consequences for its ability to generate cost-reducing innovation. The home government's subsidy forces a contraction in the optimal amount of R&D spending by the rival firm, thereby shifting profits from the foreign firm to the home firm.

Although such subsidies dominate discussion in the profit-shifting literature, other non-tariff measures, such as TBT/SPS measures, can play a similar role (Fischer and Serra, 2000). Consider a situation in which home and foreign firms are competing in the home market. The home government can impose a new TBT/SPS measure which raises both firms' costs. This measure also burdens consumers, as both firms try to pass on the additional cost in the form of higher prices. Despite this, the home government may find it worthwhile to impose the measure if, as a consequence, the foreign firm is forced to exit the home market, leaving the home firm free to earn monopoly profits, and if the resulting gains outweigh the loss in consumer surplus. The reason that the TBT/SPS measure weighs more heavily on the foreign firm is because it must re-organize production to conform with two different sets of regulations – one for products sold in the home market, and the other for products destined for the foreign market.

(iii) Equity

Governments are not only concerned with increasing national income but also with distributing income more equitably. This type of motive could be hard to distinguish from the protection for sale motive discussed below. First-best policies for income redistribution are not tariffs or non-tariff measures. In advanced countries, the fiscal system – both on the tax and expenditure side – is used to alter the distribution of income. Particularly in least-developed countries (LDCs), where fiscal systems are less developed and social safety nets often non-existent, governments appear to use trade policy instruments and NTMs in particular to achieve income distribution goals.²¹

Kalenga (2012) provides evidence that import and export bans and quota restrictions on commodity trade continue to make up a significant part of NTMs in sub-Saharan Africa. The use of export restrictions by a number of emerging economies when commodity prices spiked in 2008 was motivated in part to alleviate the pressure of high food prices on the most disadvantaged (Organisation for Economic Co-operation and Development (OECD), 2009a). Section B.3 and Box B.7 provide other examples of measures in the services sector whose underlying motive is equity and income redistribution.

(iv) Political economy (protection for sale)

All the motivations discussed above involve increasing social welfare by using non-tariff measures to correct market failures or to take advantage of a country's or a firm's international market power. However, political leaders may have other motivations beyond the welfare of citizens. For example, they may depend on financial contributions from special interest groups who want a say in trade policy (Grossman and Helpman, 1994).²² In these cases, trade protection is “for sale” to the highest bidder. If policies are being influenced by special interest groups, it should be apparent from the structure of the protection being offered and the nature of the lobbying behind it. This is discussed in greater detail in Box B.4.

The original study by Grossman and Helpman only considered the use of trade taxes – tariffs, import subsidies, export taxes and export subsidies – by “captive” policy-makers under the influence of special-interest groups. The subsequent protection for sale literature extends the analysis to cover other non-tariff measures. Maggi and Rodríguez-Clare (2000), for instance, consider a situation where importers make contributions to the political incumbent. The interests of importers are opposed to those of domestic producers who benefit from import restrictions. However, if protection is to be given anyway, importers will prefer that it takes the form of import quotas rather than tariffs because they will be able to obtain the quota rents (i.e. the income generated by imports within the quota limit). Rather than being motivated by some public policy

objective, the use of quotas simply reflects the influence of importers' interests on policy-makers. Maggi and Rodríguez-Clare point out that political contributions may be made by foreign exporters as well. This could explain the use of voluntary export restraints (VERs) since the quota rents accrue to foreign exporters rather than home-country importers.

Politicians captive to special interests might also use TBT/SPS measures or customs procedures as a means of transferring profits to their benefactors (Abel-Koch, 2010). One of the “stylized” findings from the “new new” trade theory (Melitz, 2003; Helpman et al., 2004; Chaney, 2008) is that only the most productive firms in a country are engaged in exports. This stylized fact is explained by firms' widely differing productivity (“firm heterogeneity”) and the existence of fixed costs to exporting. These are costs that are incurred by firms only once in order to access a foreign market, such as market information costs, the cost of setting up a distribution system, or the cost of complying with foreign technical regulations. The fixed cost of exporting turns out to be critical in determining which firms will be able to access foreign markets and which firms will fail to do so.

Suppose that the importing country requires all foreign goods to comply with its national TBT/SPS measures. Since this increases the fixed cost of exporting, less productive firms cannot generate enough revenues to cover the higher fixed costs of accessing the foreign market and therefore exit it. This reduces competition in the importing country and increases the market

Box B.4: Is it possible to identify disguised protectionism in NTMs?

As noted at the start of this section, non-tariff measures that are used to achieve public policy goals may also be used to pursue illegitimate ends. This makes it difficult to ascertain what motivates a government to apply a particular NTM. Without underestimating the challenge this poses, the economic literature identifies a number of benchmarks that could be used to answer the question. To complement this analysis, a set of legal tools to identify disguised protectionism based on WTO jurisprudence is discussed in Section E.3.

The “protection for sale” literature predicts that organized or lobbying sectors would be favoured. Within organized groups, the import-competing members typically obtain protection while exporting members receive an export subsidy. Grossman and Helpman also predict that unorganized sectors will be penalized, with import-competing producers facing an import subsidy and exporting sectors penalized with an export tax.²³ Sectors with low elasticities of import demand (export supply) will enjoy higher levels of protection or support. The rationale for this is that the government will prefer to raise contributions from those sectors where increased protection creates the least losses to society.

Finally, sectors where import penetration is low will enjoy greater protection.²⁴ This is because in sectors with large domestic output, producers have much to gain from an increase in the domestic price, while the economy has relatively little to lose from protection when the volume of imports is low. Using US data, a number of empirical papers have been able to confirm that the observed pattern of protection and lobbying is consistent with the predictions of the protection for sale model (Goldberg and Maggi, 1999; Gawande and Bandyopadhyay, 2000; Facchini et al., 2005; Bombardini, 2008).

The lack of transparency of a measure may also be a tell-tale sign of lurking protectionism. Political incumbents have an interest in camouflaging the transfer of income to special interests. The less transparent the measures, the greater leeway incumbents have to serve their principals.

share and profits of domestic firms. A government captive to domestic producers can use compliance with TBT/SPS measures as a way of increasing the profits of these producers.

In the protection for sale literature, it is assumed that non-tariff measures are more widely used now because trade agreements and multilateral rules increasingly constrain the use of tariffs. However, this may not be the only reason why NTMs are used by political incumbents. As is explained in Section B.2, political leaders might prefer to use TBT/SPS measures because their greater opaqueness reduces the electoral risk posed by their use (Coate and Morris, 1995; Kono, 2006; Sturm, 2006).

(c) What are the trade and welfare effects of NTMs?

The previous discussion established that, apart from political economy motives, governments use non-tariff measures to increase national welfare. This means that trade and welfare effects need not move in the same direction. The application of an NTM may reduce trade and yet increase the welfare of the NTM-applying country. The effects largely depend on the nature of the market failure, the type of NTM used, and other market-specific circumstances. Nevertheless, the trade effects of the specific measures are highly relevant.

The trade effects of non-tariff measures can be large in a world of deepening economic integration and shaped by complex cross-border production in the form of global supply chains. Using NTMs to pursue beggar-thy-neighbour policies – to manipulate a country's terms of trade or to steal profits from foreign enterprises – is a game that can be played by every country. A government tempted to employ such measures, but concerned about national welfare, will need to worry about the possibility of similar beggar-thy-neighbour NTMs being used against it by trade partners. The magnitude of the possible welfare losses from others' opportunistic actions is linked with the size of the trade effects. This issue, and the role that international cooperation can play in addressing it, is the focus of Section E.

Even in the absence of explicit beggar-thy-neighbour policies, and where non-tariff measures are only targeted at genuine market failures, the measures may be opaque, poorly designed, or badly implemented, thus increasing uncertainty and trade costs. Any country – whether the home country or its trading partner – can be guilty of these failings, which will end up reducing trade and the potential welfare gains that the NTMs were intended to achieve in the first place. One area that illustrates the potential problem is conformity assessment.²⁵

Conformity assessment procedures are technical procedures – such as testing, verification, inspection

and certification – which confirm that products fulfil the requirements laid down in regulations and standards. Generally, exporters bear the cost, if any, of these procedures. Ideally, attestation of conformity should be carried out only once in the most cost-effective manner and, subsequently, be recognized everywhere. However, in many instances, authorities in the importing country are not willing to rely on foreign manufacturers' own declarations or reports/certifications by third parties that the required specifications have been met. Whatever the TBT/SPS measure may be, assurance of compliance will be sought from domestic bodies in the importing country. This will unnecessarily raise trade costs if foreign conformity assessment bodies already possess the competence to assure them that products meet the requirements of the importing country. See Section C.2 and Section D.2 for evidence about conformity assessment procedures and estimates of the costs.

Since it is impossible to analyse the trade and welfare effect of every non-tariff measure, the following section focuses on examples regarding quantity, price and quality measures.

(i) Quantity measures

The classic example of a quantitative restriction is an import quota which fixes trade flows at a given level. Since the trade impact of a quota is unambiguous, the interesting issue is its effects on other economic variables. Section B.1(b) highlighted instances when an import quota was an instrument used to transfer income (quota rent) to special interest groups and when a government might use an import quota to achieve a public policy goal.

If the level of infant industry protection needs to decline over time, and policy-makers lack reliable information about the required policy setting, a quota may serve better than a subsidy (Melitz, 2005). If the safety of foreign products cannot be assured and there is no way for consumers to distinguish between safe and unsafe products, an import ban might be warranted. However, a careful consideration of these latter instances suggests that extenuating circumstances in the form of high information costs were required to justify the use of import quotas. In almost all other circumstances, other non-tariff measures would be preferable to quotas. For example, in the case of infant industry protection, a subsidy is superior to an import quota. Likewise, TBT/SPS measures or labelling schemes work better than a ban in addressing all but the most extreme forms of information asymmetry. The following discussion addresses other issues related to the effects of a quota.

In principle, it is possible to calculate an *ad valorem* tariff rate that, if applied in place of a quota, will have the same trade effect. Even though import levels would

be identical, there are critical differences between tariffs and quotas that have an important bearing on welfare. If demand expands because of income or population growth, for example, imports will grow under a tariff but not under a quota. A quota also generates income (quota rent) for importers whereas tariffs generate revenues for government. In addition, the existence of quota rent can lead to an unhealthy struggle among interest groups to acquire these rents, a behaviour known as “rent-seeking” (Krueger, 1974), which can either be legal or illegal (e.g. taking the form of bribery or corruption of officials). Since competing groups expend resources to capture the quota rent, rent-seeking adds to the welfare losses or inefficiencies under quantitative restriction that do not exist under tariffs.

If domestic producers have market power, a quota also gives them greater scope to restrict imports than a tariff (Bhagwati, 1968). While total imports remain the same as under a tariff, domestic producers are able to charge consumers a price greater than the world price plus the tariff equivalent of the quota. This effect is demonstrated most clearly in the case of a monopoly. Under a tariff, the domestic monopolist cannot charge any price above the world price plus the tariff without imports flooding in. However, a quota insulates the domestic market from trade once a given threshold of imports is reached, allowing the monopolist to charge the monopoly price because there is no offsetting inflow of imports.

The case where the import-competing industry is made up of an oligopoly (i.e. a market dominated by a small number of sellers) is more complicated. If the oligopolists compete with one another, it will still be true that a quota gives the domestic firms greater scope to exercise market power. The domestic price ends up being above the world price plus the tariff equivalent of the quota but less than the monopoly price (Helpman and Krugman, 1989).²⁶ If the oligopolists collude, it turns out paradoxically that the cartel may charge a lower price under a quota than under a tariff (Rotemberg and Saloner, 1988) because cartels are subject to defection by members. The higher the price charged by the cartel, the greater the temptation for any single member to cheat by selling more than its allotted share of total output. This opportunistic behaviour is rational for a cartel member even if it risks breaking up the cartel, so long as the additional profit made from cheating is greater than the present value of the reduction in future profits resulting from the cartel's collapse.²⁷ Given the possibility of a breakdown of the cartel and the lower profits it implies, cartel members may choose to charge a lower price which is just enough to prevent defections.

(ii) Price measures

In Section B.1(b), several examples of price measures (a domestic tax, a production subsidy, and an export

subsidy) were examined, as well as their use in addressing market failures (such as externalities and information asymmetry) and in shifting terms of trade and profits.

Since externalities involve a failure to incorporate the benefit or harm caused by a certain economic activity into market prices, price measures should be the preferred tool to address this type of market failure. Such measures can result in either an expansion or contraction of trade flows. If there is a legitimate case for infant industry protection, for example, a production subsidy reduces imports but also improves economic efficiency by giving domestic firms time to accumulate experience, whose learning in turn benefits the industry as a whole. In effect, there is “too much” trade since the market fails to price in domestic firms' capacity to learn and benefit other firms in the industry. A different pattern will result if a Pigouvian tax is applied to correct pollution at home and the domestic industry is import-competing. Domestic output exceeds the socially optimal amount and “too little” trade is being generated because the market fails to price in the environmental harm created by domestic producers. In this case, the Pigouvian tax results in both the imports and the welfare of the importing country rising.

By its nature, an export subsidy is intended to increase the subsidizing country's trade. Leaving aside the example discussed by Feenstra (1986), if markets are perfectly competitive, an export subsidy moves the terms of trade against the subsidizing country and reduces its welfare. Trade and welfare therefore move in opposite directions. Despite the loss in social welfare, this may well be the chosen trade policy if policy-makers are beholden to producer groups. As noted above, one of the predictions of the protection for sale literature is that organized groups in the export sector will be supported with export subsidies. If markets are oligopolistic, and firms compete in quantity, an export subsidy will move profits to the subsidizing country and increase its welfare. In this case, both trade and welfare move in the same direction. If firms compete in price, an export tax will be required to shift profits from the foreign to the home firm. Since an export tax reduces trade, trade and welfare of the country applying the non-tariff measure move in opposite directions.

Although we do not normally think of price measures when confronted with problems of information asymmetry, we saw an example of how an export subsidy could be used to overcome that market failure in Section B.1(b). Uncertainty in the importing country about the quality of foreign goods acts like a market barrier. The export subsidy allows the foreign producer with the high-quality good to introduce its product to consumers in the importing country by selling at a lower price. If enough consumers there have a taste for the high-quality good, trade expansion

will be coupled with a welfare gain for the importing country.

(iii) Quality measures

As explained above, a quality measure will require changes to the technical features of imported products which can be either an obstacle to or a catalyst for trade. Requiring exporters to comply with the importing country's TBT/SPS measures can increase trade costs and diminish their export prospects. On the other hand, if compliance with the TBT/SPS measure resolves uncertainty about the quality or safety of the imported product, greater consumer confidence can increase the demand for the item and increase trade. The trade and welfare effects of a quality measure depend on whether it addresses genuine market failures. If the measure is applied only to protect domestic producers, both trade and welfare in the importing country decrease. If, on the other hand, the measure corrects an existing market failure, welfare is likely to increase with ambiguous effects on trade.

Take the extreme case where there are no market failures but where the importing country requires all imported products to comply with a newly introduced TBT/SPS measure.²⁸ It is possible to distinguish two types of trade costs that would be increased by the requirement to comply with the importing country's regulation. Compliance can increase the variable cost of exporting, with each unit of export incurring an additional cost. Alternatively, compliance can require the exporting firm to revamp its production process or upgrade its technology. In this case, irrespective of the volume of exports, the firm will incur a fixed amount of expenditure if it wants to access the foreign market.

An increase in either fixed or variable costs will have two effects. First, it will decrease the volume of exports of those firms who continue to serve the export market. This is sometimes referred to as the intensive margin of trade. Secondly, the least efficient exporters will no longer be able to cover their fixed costs of exporting and so would be forced to quit exporting altogether, sometimes referred to as the extensive margin of trade.²⁹ Where TBT/SPS measures are imposed in the absence of a market failure, social welfare will fall in the importing country. Consumers in the importing country lose out both because the variety of goods is reduced, as some exporters exit the market, and because prices rise as the volume of trade declines. This is not to say that there will be no winners in the importing country. Domestic firms stand to gain because the withdrawal of some exporters and lower sales from remaining exporters reduces competition in the home market.

However, suppose that there is a genuine market failure involving information asymmetry. Consumers in the importing country are uncertain about the safety of the foreign good. Firms in the exporting country may be newcomers to global trade and have little or no reputation to build on. Foreign producers know if their product is safe or not, but consumers in the importing country have no reason to trust their claims. Under these circumstances, there may still be demand for the foreign product, but it is likely to be low. Requiring foreign products to comply with the importing country's TBT/SPS measures can resolve this uncertainty in the mind of consumers. Compliance, however, adds to the exporting firms' cost of production.

Under these conditions, the regulation will have two opposing effects on trade (see Box B.5). The need to conform to the new regulation raises the cost of the imported good which will tend to lower the volume of trade. However, enhanced consumer confidence in the safety of the foreign product will increase demand for it. While it is possible that the increased compliance costs will force some exporters to exit the market, others will use their compliance with the regulation as a competitive advantage and increase their market share. In the context of food safety regulations, for instance, Jaffee and Henson (2004) note that more stringent SPS measures in rich importing countries have different impacts on the competitive position of developing countries, exposing the weaknesses of some producers but accentuating the underlying supply-chain strengths of others.

Furthermore, some countries use high-quality and safety regulations to successfully position themselves in global markets. Like trade, the effect on welfare is ambiguous and depends on the relative strengths of the forces acting on consumers and domestic producers. The increased cost incurred by foreign exporters to comply with the measure should increase output and revenues for domestic producers. For consumers, there are two opposing effects – a higher price for the product which needs to be weighed against the improvement in the product's safety or quality.

Finally, while Box B.5 seems to suggest that an increase (decrease) in trade leads to an increase (decrease) in welfare, this does not necessarily hold under more general conditions. This is shown in Disdier and Marette (2010) for example, where despite a reduction in trade, welfare improves when the application of a TBT/SPS measure corrects an existing market imperfection. This result is consistent with the argument that sometimes the adverse trade effect of a non-tariff measure is a by-product of pursuing a legitimate public policy goal.

Box B.5: Effect of TBT/SPS measures on trade and welfare

Assume that a country does not produce the good X and meets all its consumption through imports. These imported goods differ widely in quality and consumers are unable to tell them apart. Because of this uncertainty, demand is low (given by the line BD in Figures B.1(a) and (b)) and price is equal to OW. Imports are equal to OA. The government of the importing country requires foreign producers to comply with a quality assurance programme; otherwise their goods will not be allowed to be sold in the country. Compliance raises the costs of foreign producers so that the price they charge rises from OW to OW'. However, consumers are now assured that only high-quality products are being sold in the market which leads to a shift in their demand to BD'. One possible outcome is that total imports rise to OA' in spite of the higher cost of imported goods (see Figure B.1(a)). Some consumer surplus is lost, given by the area labelled WW'EF, as a consequence of the cost of compliance. However, the increased confidence in the higher-quality imports results in a gain equal to the area labelled BEC. Overall, there has been an increase in consumer welfare so in this case both societal welfare and trade increase at the same time. Another possible outcome involves imports declining (see Figure B.1(b)). The increase in consumer confidence is not sufficient to overcome the higher cost of compliance. In this second example, both trade (falling from OA to OA') and societal welfare decline (the loss of WW'EF outweighs the gain of BEC).

Figure B.1(a): Effect of TBT/SPS measures on trade and welfare: both increase

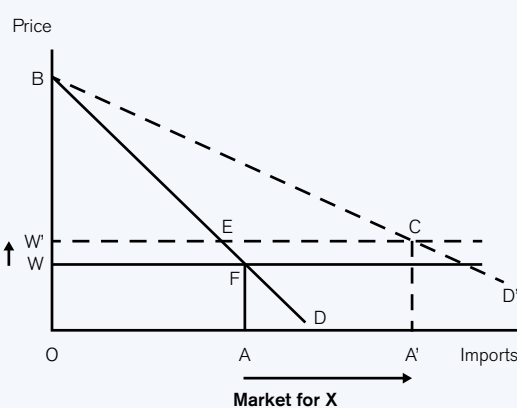
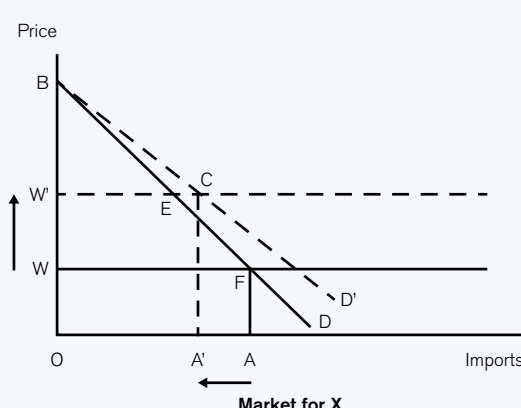


Figure B.1(b): Effect of TBT/SPS measures on trade and welfare: both decrease



2. The choice of NTMs in light of domestic and international constraints

In the previous sub-section it was shown that in many instances, non-tariff measures, even though they affect trade, are first-best policies to address a legitimate public policy objective, such as consumer health and safety protection. However, the same measures can also be employed in a way that distorts international trade. In order to decide in such cases whether an NTM is innocuous, it is useful to determine whether the measure is likely to be pursued for competitiveness reasons rather than the stated public policy rationale or whether it may affect trade more than is necessary to achieve its policy aim.³⁰ Section B.2(a) explores a range of scenarios in the domestic political and economic context in which governments may be inclined to misuse NTMs in this manner. Section B.2(b) considers how far sub-optimal policy choices reflect government-imposed constraints on alternative options. The question of possible “policy substitution” may arise when international trade agreements limit the use of tariffs

and certain types of NTMs but regulate other, less efficient options less effectively.

(a) Use of NTMs and domestic policy considerations

An important reason why governments may choose to pursue trade policy objectives by applying non-tariff measures associated with other public policy goals, or, more generally, may not choose the most efficient measure for this purpose relates to the lack of transparency of certain NTMs regarding their ultimate effect and purpose. This “opaqueness” may make such measures more attractive for politically motivated interventions where beneficiaries and the size of the effects are not easily identified. Other explanations for such policy choices emphasize institutional constraints that entice politicians to choose NTMs with certain characteristics even if these measures are economically wasteful compared with alternative means.

The fact that some NTMs entail a fixed rather than variable cost is another factor that may explain why a government subject to pressure from particular groups

may favour NTMs over tariff protection. Finally, the existence of market power in a context of offshoring (and the possibility of extracting profits from exporters) may explain why trade concerns can lead both welfare- and politically oriented governments to tamper with domestic policies rather than border policies alone. Each of these explanations is discussed in turn.³¹

(i) *Transparency*

Although it has been argued that in competitive political systems, politicians who favour specific interest groups in an inefficient manner would be voted out of office (Stigler, 1971), the political economy literature has increasingly paid attention to the form of government intervention. One branch of the literature presumes that citizens are poorly informed as to the effects of various policies and the extent to which different politicians may be receptive to lobbying. It is not unrealistic to assume that politicians have better information than citizens about whether the conditions for a welfare-improving policy intervention are actually satisfied.³² In addition, it may be true that citizens remain unsure after a policy is implemented whether the government has acted in the national interest or simply catered to organized interests.

In particular, as Tullock (1983) observes, policies may be chosen that benefit organized interest groups and, at the same time, are justifiable on other widely accepted grounds, such as environmental protection, and, hence, may affect positively the government's reputation with the public at large. This mismatch in information between citizens and the government about both policies and politicians' motivations can lead to the implementation of "inefficient 'sneaky' methods of redistribution over more transparent efficient methods" (Coate and Morris 1995: 1212), even when the latter are available.

In the field of trade policy, non-tariff measures may be a means to increase the income of producer lobbies while concealing the associated costs and/or the true benefits of the alleged policy objective (e.g. health, environment) to the public at large.³³ Rather than tariffs that are straightforward in their price impact and cost to consumers, an "opaque" NTM, such as an environmental regulation, may shelter an import-competing sector from foreign competition and, at the same time, be perceived as being in the public interest, even though a proper cost-benefit analysis may not show a net welfare gain. Uncertainty about the justification for, and impact of, different policies cannot explain on its own the use of opaque non-tariff measures, as competition among politicians would allow voters to sanction those politicians that pursue less efficient policies.

However, this changes when the possibility of "government failures" is taken into account. Coate and Morris (1995) describe a situation where different "types" of politicians are competing for office and voters

are unsure as to the true nature of politicians' intentions. In such a case, reputation matters. "Bad" politicians, i.e. those who wish to increase the income received by special interest groups at the expense of the general public, may have an incentive to implement a "public" policy that indirectly benefits the preferred interest group, even though it is not warranted on grounds of national welfare, because open favouritism to certain groups would entail a greater reputational damage.³⁴

In other words, by increasing the income of special interest groups through "opaque" rather than direct means, these politicians limit the negative reputational impact. This is because voters cannot be sure that a given public policy is being misused by "bad" politicians, as "good" politicians would pursue the same policy, albeit only if it resulted in an overall net welfare gain. As noted above, this presupposes that citizens are unable to determine the overall costs/benefits of the public policy in question with any degree of confidence both before and after it is implemented. This is a plausible assumption for policy decisions in many areas (Coate and Morris, 1995).³⁵

The authors specifically cite the example of temporary infant industry production subsidies pursued to encourage learning by doing. Whether these subsidies benefit the public or not ultimately depends on the amount of learning by doing they engender, and it will be difficult for citizens to verify whether such subsidies were in their interest. Sturm (2006) cites a number of recent trade disputes over environmental or health regulations to construct a similar model, in which uncertainty about the optimal level of regulation allows politicians to provide disguised protection to the local industry and, hence, to limit possible negative consequences in future elections.³⁶ Like Coate and Morris (1995), Sturm (2006) characterizes such "green protectionism" (i.e. the unwarranted implementation of a product regulation in view of the limited environmental risk) as a political failure, as preferable instruments from a welfare perspective are available – in this case, direct subsidies to local producers. However, these are not chosen by "bad" politicians owing to their potentially negative impact on the politicians' re-election prospects.

In an interesting extension to the Coate and Morris (1995) set-up, Sturm (2006) also considers the political conditions in the exporting country. It is assumed that the foreign country has a comparative advantage in the product in question and that it would be more costly for foreign producers to comply with an environmental regulation than for domestic producers. Politicians in the exporting country (both "good", i.e. solely social welfare-oriented, and "bad") would therefore oppose the product regulation for its negative impact on the country's terms of trade. However, due to the same political failure described above, "bad" foreign politicians would oppose compliance with a product regulation even if the environmental risk was sufficiently high to

affect welfare of consumers in their own country. In other words, although adherence to the environmental regulation would increase welfare in the exporting country as well, bad politicians would continue to oppose it to the benefit of their constituency in the export sector, a situation the author calls “environmental dumping”.

A situation where politicians in the importing country implement the product regulation, while politicians in the exporting country do not (i.e. a potential face-off on the trade impact of environmental policy), can have implications for their reputations in any one of the two countries. While voters may be unable to distinguish whether the foreign environmental policy is too lax or the domestic regulation too high, they know that such disagreement over the appropriate environmental policy implies that at least one of the two incumbent governments is of the “bad” type, i.e. prone to influence from producer lobbies.

In other words, the “politician who is distorting the environmental policy ... imposes a negative reputational externality on the other incumbent” (Sturm 2006: 576), and, by implication, disagreement over the appropriate policy with a respectable politician in another country can entail a reputational damage for a domestic incumbent. In practice, this implies that transparency and the free flow of information on policies and political processes across countries can help to constrain special interest-oriented policy choices.³⁷ Section E discusses further the rationales for cooperation on government regulations, for example in the fields of SPS measures and TBT, and other types of NTMs and highlights the importance of transparency.

(ii) *Institutional constraints*

Institutional constraints can make economically less efficient non-tariff measures better for the interests of politicians or social groups that hold political power. First, governments may be limited in their ability to direct benefits to important constituents. They may lack the information necessary to target resources towards their supporters, or the credibility to maintain those policies, without an otherwise inefficient non-tariff measure.

Secondly, if the public elects a new government, the interest groups that support the incumbent may lose influence. Inconsistency problems between the government and its supporters lead politicians to try to enact policies that are difficult to reverse. Certain NTMs may be less exposed to the winds of political change. Finally, government policy is not a “monolith”, but rather reflects the interests of parochial departments, bureaucrats and legislators. Intra-governmental conflict can create frictions that lead to the implementation of inefficient NTMs favouring one particular interest over another.

Targeting political supporters

Some non-tariff measures that are comparatively inefficient, such as a market-distorting regulation, can help the government to target policies towards their favoured constituency. Concretely, a government may prefer a policy that is less efficient if its outcome is more predictable. In order to illustrate why such distortionary policies persist, Mitchell and Moro (2006) describe a case in which removing an inefficient trade measure creates winners and losers in society.³⁸ The authors presume that the NTM in question is “informationally” efficient, as compensating those that would lose from trade opening requires knowing the extent to which foreign market competition actually causes the harm, while keeping the NTM in place requires no such additional knowledge. It is assumed that information about actual losses is private, i.e. “losers” from trade opening have the incentive to over-report their losses.

If the government worries about excessive spending on compensation policy, it may prefer to sustain the NTM rather than make decisions about how much to compensate.³⁹ Here, a key assumption is that the effects of an NTM are easier to verify than the effects of trade opening. This argument is less plausible if the costs of over-compensation are low or the government is equally informed (or equally ignorant) about the effects of an NTM compared with a more efficient redistributive policy.

Acemoglu and Robinson (2001) address a similar problem in the following example. If farmers hold significant political sway, the government may consider providing either a lump-sum transfer (i.e. income support) or price support in order to maintain favour with this group. Price support represents a less efficient instrument because of its effects on product markets, and from a national welfare perspective, the government should prefer a lump-sum transfer. However, despite its negative effects on consumers and trade, governments may prefer price support, which efficiently targets those who are genuinely farmers in the short-run, as farm output is a prerequisite for receiving the subsidy. Conversely, lump-sum payments might go to a larger number of beneficiaries who merely claim or pretend to be farmers (Stigler, 1971).

In addition, Acemoglu and Robinson (2001) highlight that price support increases the returns to farming and, in the long run, encourages more entry into farm activities, which further entrenches farmers’ political power. Hence, for the government the distortive effects of the price support policy are potentially outweighed by the benefits of solidifying the political power of its favoured constituency.

Policy reversals

In competitive political systems, governments in power change, which can lead to policy reversals. From the

perspective of an interest group, relatively more efficient policy measures such as a one-time subsidy or a tariff may have the disadvantage of being subject to review by new legislatures or other elected officials. By contrast, certain non-tariff measures, such as product regulations, may be defined and implemented by regulatory agencies unaffected by political change and may not be subject to a regular renewal process. Rubin (1975) notes that such long-lived but inefficient policies can benefit politicians by increasing interest group support.

Politicians who are unsure about their own re-election prospects receive less from lobbyists for a short-term, reversible policy. However, politicians may nonetheless receive benefits from special interests if they put in place measures, such as product regulations and the related bureaucratic apparatus that last beyond their expected careers. Inefficient NTMs which lack regular oversight also call upon fewer resources to influence the political process and, thus, are less expensive for lobbyists with sufficiently long-term horizons.⁴⁰

Intra-governmental conflict

Even if legislators do have regular oversight of regulatory policy measures, the bargaining necessary to pass legislation can distort policy decisions. Each legislator must decide how to allocate resources towards policies that benefit the whole country and those that primarily benefit their local constituency. Politicians may be willing to pass a policy of national interest only if, for example, a subsidy is given to an industry located in their home district. As all legislators may need to cater to special interests, inefficient policies can proliferate (Weingast et al., 1981).⁴¹

Further inefficiencies can arise if each legislator represents a number of constituents with conflicting interests. Dixit et al. (1997) develop a model in which interest groups spend resources on lobbying for government policy. As with the farming case above, lump-sum cash transfer policies by the government would be more efficient from a welfare perspective, but the authors demonstrate that competition between individual interest groups for more transfers can lead to an inefficient allocation of resources to lobbying. This can explain why the interest groups may seek to agree on a comparatively less efficient non-tariff measure that may not require them to lobby. While such an NTM reduces overall efficiency, it ultimately channels more resources to the groups.

The oversight problem also arises because of a lack of coordination within governments and across agencies that produce and regulate non-tariff measures. Because agency jurisdiction is often allocated according to a function, a given kind of NTM can be the responsibility of a number of overlapping departments or committees within a government. Efficient policy-making requires the contribution and cooperation of a number of agencies with different institutional interests, but these

agencies may not value the overall policy goal as much as a parochial interest. As a result, intra-department miscommunication or competition can produce persistently inefficient policies. This implies that reforming NTMs that involve a range of domestic and possibly sub-national regulatory agencies may require broader attention to the potential bureaucratic frictions that prevent cooperation (Gulotty, 2011).

(iii) *Firm preferences for trade measures inducing fixed costs*

Recent economic research on the diverse nature of firms within a particular sector in terms of productivity and size has led to another rationale why trade protection may come in the form of “behind-the-border” non-tariff measures rather than border protection. A range of NTMs, such as TBT/SPS measures, have an important fixed cost component, as costly production adjustments have to be made, but per unit costs subsequently decline as more output is sold in the respective market.⁴²

Owing to productivity and size differences among firms, fixed cost increases affect firms differently, unlike variable levies that raise costs for every firm by the same percentage.⁴³ Hence, although a technical product regulation affects both domestic and foreign firms, the fixed costs it entails represent a higher burden for smaller and less productive firms in both countries. As a consequence, the least efficient firms will cease to be competitive and exit the market, while the more productive and larger firms both domestically and abroad will see their profits and market shares increase. Ultimately, behind-the-border non-tariff measures of this sort only benefit the country introducing the measure as a whole if the ratio of very efficient to very inefficient firms is larger at home than in the exporting country (Rebeyrol and Vauday, 2009; Abel-Koch, 2010).⁴⁴ This is in contrast to border measures, which always penalize foreign firms to the benefit of domestic producers.

Under what circumstances, then, would a behind-the-border non-tariff measure rather than border protection be introduced? Of course, like border measures, distortionary behind-the-border measures may also have a negative impact on consumer welfare. However, as discussed in the previous sub-sections, a politically-oriented government may yield to lobby pressure from domestic producers. Assuming that only the largest and most efficient firms have the means to lobby the government,⁴⁵ they may gain more from the introduction of a behind-the-border NTM at the expense of small, less productive producers at home (even if some of the gains also go to more productive competitors abroad) than from border protection that shields all domestic firms (including those that do not lobby) from foreign competition.

Lobbying for a more demanding product regulation is more likely the less the government is concerned

about social welfare and the fewer foreign firms are active in the domestic market. The reason for the latter is that when trade is already low (e.g. due to largely inefficient foreign firms or existing border protection), an increase in behind-the-border non-tariff measures has a relatively more important effect on domestic competition. To some extent, this is counter-intuitive to the idea of policy substitution, i.e. the increase of behind-the-border NTMs when border measures are liberalized. This is further discussed in the sub-section that follows, where empirical evidence in support of policy substitution is also presented.

At higher levels of regulation, the marginal gain from behind-the-border non-tariff measures declines (and hence the political contributions lobbying firms are willing to make) and at some point becomes smaller than the marginal loss in social welfare (despite the larger weight given to organized producer interest). As a result, behind-the-border NTMs may be set at some “intermediate” level.

Conversely, for border measures targeted exclusively at foreign producers, the domestic producer lobby’s marginal gain in profits (and related political contributions) do not decrease with higher levels of protection and lobbies who gain a lot from keeping foreign competition out and governments that care little for social welfare may implement a prohibitive level of border protection, or vice-versa, none at all (Abel-Koch, 2010). In sum, although the author formally does not consider lobbying for behind-the-border as opposed to border measures simultaneously, it is interesting to note that when behind-the-border NTMs are introduced, the conflict of interest between domestic producers pitting an organized lobby of productive firms against the rest may lead to less restrictive measures than if border protection were pursued.

(iv) Offshoring and bilateral bargaining

The increased role of international production networks in today’s global economy and the fragmentation of the production process across borders have required a fresh look at the impact of non-tariff measures and services measures on international trade and at the incentives for government intervention. In Section B.1, it was noted that international production sharing may add to market imperfections, such as information asymmetries (Kimura and Ando, 2005) that can provoke regulatory intervention, for instance in relation to safety and quality control. In their seminal work, Jones and Kierzkowski (1990; 2000) emphasize the effects that governmental measures in “services links” connecting fragmented production blocs can have on trade in intermediates, while such measures play less of a role when the production of goods is integrated and trade takes place in final products.

In regard to political economy rationales, Grossman and Helpman (1994) mention that the protection for

sale framework can easily be extended to allow for imported intermediates, without changes to its fundamental outcomes. Protection would still be provided to politically organized final goods producers rather than producers of intermediates, as the former would lobby against protection for the latter.⁴⁶

While the fragmentation of the supply chain affects governments’ motivations to intervene and enlarge the ambit of relevant policy areas, as established in Section B.1, it may also involve new constraints and considerations in the choice of policy measures. In a recent set of papers, Staiger (2012) and Antràs and Staiger (2008) formalize a novel, explicit mechanism in relation to the international fragmentation of the supply chain that could lead to an increased use of non-tariff measures. In their framework of offshoring, the determination of international prices changes from one governed by market clearing mechanisms to one characterized by bilateral bargaining between foreign suppliers and domestic buyers. As noted in Section B.1, in such a situation, governments can be expected to use tariffs as a “first-best” instrument for extracting profits from foreign exporters.⁴⁷ However, with international offshoring, even though the government may be free to use tariffs, other policies, including behind-the-border NTMs, may also be used, resulting in a distortion of their efficient levels.

The key feature in international offshoring emphasized by the authors is the relationship-specific nature of trade between importers and their specialized suppliers abroad. Owing to the specificity of the input, foreign suppliers hold some market power over the importing producer. At the same time, once the input is produced by the exporter according to the importer’s specifications and the related investment is sunk, the importer can wield its bargaining power to obtain a share of the foreign supplier’s profits. As a result, international prices are determined by bilateral bargaining rather than market clearing. This phenomenon, which has become known as the “hold-up” problem in the economics literature, leads to the situation of “under-investment” by foreign suppliers and, hence, an insufficient supply of inputs to domestic producers.⁴⁸

The domestic government now faces a tension in its objective to maximize national welfare: it must provide incentives to foreign input suppliers to produce more and, at the same time, it must help domestic producers importing these inputs to appropriate maximum profits in the bilateral bargaining with the foreign supplier.

In order to pursue these different objectives in its foreign trade relationship, the government will not only adjust its tariff policy on inputs, but also employ measures in regard to final products. It will do the former to increase the supply of foreign inputs and the latter in order to affect prices received by producers and, hence, profits all along the supply chain. Concretely, Antràs and Staiger (2008) seek to develop

a realistic scenario, where a politically motivated government (i.e. one that attaches a higher weight to producer benefits) may reduce tariffs on imported inputs (which has a positive effect on supply), but seek to increase the price of the final product, e.g. via an import tariff or an export subsidy. A disproportionate part of the costs of these distortions is borne by consumers, but a government that is sufficiently influenced by organized producer interests may be willing to allow this to happen in order to help domestic producers to increase their profits, even though some of these profits may also be dissipated along the supply chain to foreign input providers.

Building on this approach, Staiger (2012) constructs a model in which the government applies non-tariff measures on top of tariffs to the same product in order to maximize national welfare in a situation of bilateral bargaining with foreign producers.⁴⁹ In his set-up, the consumption of a good that is subject to bilateral bargaining when imported and also domestically produced entails an adverse effect on the environment. A consumption tax is imposed in order to “internalize” this environmental externality – that is, to reduce the over-consumption of the product in question owing to the lack of consideration by consumers of the environmental harm imposed on others. It can then be shown that the level of the domestic consumption tax used to address the environmental externality would be set “inefficiently”, as part of the costs of the tax would be borne by the foreign input supplier.

Concretely, under certain conditions, the importing country can be made better off when import tariffs on the product are reduced and the domestic consumption tax is increased. The reason for this is that in Staiger's model, lower tariffs directly affect the pricing and production decisions of exporting firms. On the other hand, because consumers experience diminishing “utility” from higher levels of consumption of the same product, the tax does not alter consumer behaviour in a linear fashion.

While the tax partially induces consumers to cut consumption, some of the burden of the tax is imposed on the foreign producers by lowering producer prices.⁵⁰ Through this mechanism, the government is able to ensure a given supply of the good in question by lowering tariffs, while at the same time reducing foreign profits to the benefit of domestic importers. This adjustment is eventually stopped when the distortion of domestic demand, taking into account the marginal costs and benefits of containing the environmental externality, becomes too high in terms of national welfare. While the government's motivation to use non-tariff measures in such a situation is discussed in relation to a domestic consumption tax (as a targeted product-specific and detailed price instrument), Staiger (2012) briefly explains that the underlying logic could also apply to other forms of “behind-the-border” NTMs, such as TBT measures. In particular, the author asserts that in practice

governments tend to apply uniform sales or value-added taxes across wide ranges of products rather than levying differentiated taxes on individual goods. He shows that where product-level domestic taxes are unavailable or difficult to implement, offshoring and bilateral bargaining can lead to a situation in which product regulations are set to be inefficiently high.

(b) Use of NTMs and international constraints

Governments can use multiple policies to achieve a given objective. In the case of a market failure, the “first-best” policy to address a single distortion is one that offsets the source of the distortion directly. For instance, if the domestic production of a certain good is associated with positive externalities for an economy, a production subsidy is the “first-best” policy – it is welfare-superior to an import tariff. What then happens in a situation where an economy faces a domestic distortion, an externality for example, but also has monopoly power in trade in that it can affect the world price of the given product? In a non-cooperative framework, a government would introduce two “first-best” or most efficient policies – a non-distortionary non-tariff measure to tackle the former and a suitable tariff for the latter (Bhagwati and Ramaswami, 1963). However, the “first-best” or most efficient measures may not always be used by governments.

The previous section showed that governments may choose to pursue trade policy objectives using non-tariff measures rather than tariffs even when the latter, more efficient, measure is available to them. It attributed this to institutional factors, the lack of transparency of certain NTMs, the fact that some NTMs entail a fixed rather than variable cost and the existence of market power in a context of offshoring. However, it may also be the case that the more efficient measures are not always available to governments. This section discusses the use of NTMs in light of constraints imposed by international trade agreements – both multilateral and regional.

(i) *International constraints*

Under the auspices of the GATT/WTO, the last 60 years have seen a dramatic multilateral reduction in tariff barriers owing to agreements that require members to respect the negotiated tariff bindings – ceilings on applied tariffs. If members set tariffs above that binding, they may be subject to a costly dispute initiated by another member. Similar constraints also affect other trade policy measures – for example, non-tariff measures such as import and export quotas as well as export subsidies are generally prohibited, although their use is allowed for “legitimate” reasons in specific cases. Even in preferential trade agreements (PTAs), countries agree to preferential tariffs between themselves and, in

customs unions, to set a common external tariff, whereby non-enforcement of these tariffs could generate costly retaliation by other PTA members.

Unlike border measures, disciplining behind-the-border non-tariff measures explicitly under the multilateral trading system, for instance, is more challenging for the following reasons. First, they are typically less transparent. Secondly, as alluded to in Section A, NTMs are often highly complex and country-specific. This means that the formulation of general rules to discipline them is likely to involve different authorities who are not used to coordinating with others. Thirdly, while NTMs may have adverse trade effects, some of them are associated with legitimate public policy objectives. Despite these difficulties, NTMs are not left entirely unregulated because members of a trade agreement could otherwise undo any negotiated tariff restrictions by, for instance, imposing different sales taxes for imported and domestic products (Horn, 2006). Of course, to the extent that countries can use NTMs in import-competing sectors as a means of reducing trade flows, they can undermine commitments previously made with respect to trade policy (Bajona and Ederington, 2009).

(ii) *Policy substitution*

It is likely that as countries sign successive rounds of trade agreements that constrain their ability to pursue trade goals through trade policy (tariffs and certain border non-tariff measures), other NTMs, including those behind the border, become attractive tools for terms-of-trade manipulation that shifts costs onto foreign exporters. In other words, there will be incentives for governments to distort their NTMs as a secondary means of protecting import-competing industries (Copeland, 1990; Ederington, 2001; Bagwell and Staiger, 2001; Bajona and Ederington, 2009). In this context, it is even argued that there is a “Law of Constant Protection” (Bhagwati, 1988).

According to Anderson and Schmitt (2003), when tariffs are constrained cooperatively, quotas would be the preferred measure among the set of border NTMs for governments looking for alternative measures. Anti-dumping policies are likely to be used only when the use of quotas is also sufficiently constrained by international agreements.⁵¹

Similarly, if a government cannot respond to competitive pressures abroad by unilaterally restricting market access with an increase in its tariff, it may be drawn into imposing a behind-the-border NTM. For example, it may be tempted to improve the relative cost position of a domestic firm by relaxing technical regulations in its import-competing industry, thereby restricting access to foreign suppliers. Some foreign suppliers who export to these markets may actually lower their prices to remain competitive with domestic

producers.⁵² However, even such terms-of-trade movement leads to foreign producers absorbing some of the costs of the weakening of domestic technical regulations (Bagwell et al., 2002). Hence, in light of falling trade barriers, this regulatory cost shifting could result in a “race-to-the-bottom” problem where governments might be tempted to relax technical regulations that apply to import-competing industries in the name of international competitiveness – those relating to labour and the environment are prominent examples (Bagwell and Staiger, 2001; Bagwell et al., 2002).

According to Bagwell et al. (2002), the true source of the “race-to-the-bottom problem” is not that weak foreign technical regulations generate competitive pressures that induce inefficiently low domestic technical regulations. Rather, it is the imperfections in property rights over market access commitments in trade agreements – a government is not free to adjust its policy mix so long as it maintains its market access commitment. For instance, if a government increases technical requirements in its import-competing industry, this industry would be subjected to increased competitive pressure from abroad. However, because trade policy is constrained by an international agreement, the government would not be able to raise its tariff (without a penalty) and maintain its market access commitment.

It is worth noting that instead of a “race-to-the-bottom” problem, it may even be the case that increased constraints on tariff policy imposed by international agreements are accompanied by rising technical regulations. The international cost-shifting incentive described above may instead create a tendency for governments to impose more stringent domestic technical regulations if the domestic firm in an import-competing industry finds it easier to comply with them, i.e. if the technical regulation improves the relative cost position of the domestic firm (Staiger and Sykes, 2011). However, even when a technical regulation increases the costs of production more for the foreign firm than the domestic firm, the substitution of technical regulations for tariffs which are constrained by an international agreement is far from straightforward.

In a recent study, Essaji (2010) considers two scenarios. First, when tariffs are prohibitive and hence when a small tariff reduction enables minimal participation by the foreign firm, governments are likely to have an incentive to raise technical regulations. This is because the tariff cut increases the marginal benefit of the regulation – because imports become cheaper, the regulation becomes the instrument which can improve the domestic firm's relative cost position and hence its profits. At the same time, by worsening the foreign firm's production costs, and reducing imports, the technical regulation reduces tariff revenues. Hence, if the government cares about tariff

revenues, its optimal regulatory response to tariff cuts is less clear. However, prohibitive tariffs are increasingly rare.

Secondly, in the case where the foreign firm already has a significant market presence, the relationship between tariff cuts – that deepen foreign penetration even further – and rising technical regulations is more tenuous. Technical regulations reduce consumer surplus. However, a reduction in tariffs diminishes the regulation's marginal impact on consumer surplus because it lowers prices faced by consumers. Similarly, while regulations shift profits to the domestic firm, tariff cuts – by making imports cheaper – diminish the regulation's marginal effect on domestic firm profits.

Given the above, if the government only cares about consumer surplus and the domestic firm's profits, it would respond to tariff cuts by relaxing technical regulations. This suggests that because constraints on the use of tariffs weaken the effectiveness of a technical regulation as an instrument, tariffs and technical regulations are actually complements. It underscores that what matters for policy substitution is not the direct effects of measures, but how the weakening of one measure affects the marginal effectiveness of the other. The government's response is more ambiguous when it also worries about tariff revenues and negative consumption externalities.

A reduction in tariffs, bound by an international agreement, enhances the regulation's marginal effect on the consumption externality because it remains the only instrument to reduce demand in the economy. Similarly, tariff reduction enhances the regulation's marginal effect on raising tariff revenues – constraints on increasing tariffs imply that altering technical regulations is the only way in which the government can influence imports and hence tariff revenue. Hence, if the impact of the regulation on the consumption externality is large and/or if the initial tariff rate is high, the improvement in the regulation's capacity to reduce the externality and raise tariff revenues, on the margin, may offset the reduction of its marginal effects on domestic profits and the consumer surplus. In this situation, governments may respond to tariff reductions by technical requirements, i.e. policy substitution.

The findings of Essaji (2010) suggest that the proliferation of technical regulations in recent years may not be driven by a desire to protect domestic firms' profits when tariffs are constrained by an international agreement, but rather it may reflect a growing awareness of consumption externalities. Governments will have an incentive to increase technical regulations only if the net marginal benefit of the regulation increases with falling tariffs.

(iii) *What does the evidence suggest?*

There is an empirical literature which uses formal statistical methods to analyse whether or not constraints imposed by international or bilateral trade agreements on governments' ability to set tariffs may induce some countries to replace them with non-tariff measures. Using data from Colombia during the mid-1980s (and early 1990s), Goldberg and Pavcnik (2005) find that tariffs and NTMs were positively correlated, i.e. tariffs were reduced, not simply to be replaced by NTMs.

Analysing data for a large cross-section of countries (91) for a more recent time period (the early 2000s), Kee et al. (2009) find that the average *ad valorem* equivalent (AVE) of non-tariff measures appears to increase with GDP per capita. However, they also find that the overall level of protection decreases with GDP per capita, mainly driven by average tariff levels that tend to be significantly lower as countries become richer. It suggests that, in general, tariffs may be substituted by NTMs. This is reinforced by their findings at the tariff line level, where tariffs are negatively correlated with the AVEs of NTMs. Similarly, Broda et al. (2008) show that after GATT/WTO tariff commitments constrained the United States in its ability to use tariffs for the purpose of terms-of-trade manipulation, the country set significantly higher NTMs in import-competing sectors where it had greater ability to affect foreign exporter prices.

In a more recent study, using data on tariffs and non-tariff measures for about 5,000 products, Limao and Tovar (2011) exploit the variation in tariff constraints generated by the two most common commitment devices – multilateral and preferential trade agreements (PTAs). Importantly, the authors establish a causal impact of the resulting tariff constraints on the use of NTMs – not merely a correlation which may be influenced by other factors. Consider the following. Differences in the size of member states in a PTA, which is a customs union, lead to the common external tariff being determined by the tariffs of the larger partner. This can generate a large change in tariffs for the smaller partner that is likely to be “exogenous” – that is, independent of other determinants of its trade policy.

The aforementioned argument is relevant for the analysis in Limao and Tovar (2011) because they focus on a single country, Turkey, which had to adopt pre-existing EU tariffs in a large number of products. So if the common EU tariff constrained Turkey in its tariff-setting, this could have had a causal impact on protection via non-tariff measures on non-EU exporters. Limao and Tovar (2011) find evidence of policy substitution – tariff commitments imposed via the WTO and the PTA with the European Union increase the probability of Turkish NTMs. They also find that the likelihood and restrictiveness of Turkish

NTMs increase with the stringency of those tariff commitments. Furthermore, it is worth noting that the authors find imperfect policy substitution, thereby implying that tariff commitments – while partially offset by higher NTMs – may have still reduced total protection.

The studies discussed above analyse a broad set of non-tariff measures, including domestic product standards, technical regulations and voluntary export restraints. There is also a literature which analyses a possible substitution effect between tariffs and a particular class of NTMs – anti-dumping (AD) initiations. Evaluating data for 24 countries (17 developing and seven developed countries) during the period from 1996 to 2003, Feinberg and Reynolds (2007) find that trade opening commitments made in the Uruguay Round – measured by changes in bound tariffs – have a statistically significant, albeit small, positive effect on the likelihood⁵³ of a WTO member using AD protection. In addition, they use a simulation exercise to show that had tariffs not been reduced by the Uruguay Round, there would have been 23 per cent fewer AD cases from 1996 to 2003. When only considering the AD cases brought by the developing countries in their sample, Feinberg and Reynolds (2007) find a much larger positive effect of a promised reduction in tariffs under the Uruguay Round. This holds true both for the likelihood of a WTO member using AD protection and the total number of AD petitions filed by WTO members.

To view the above as evidence of policy substitution, however, one must be cautious. Developing countries did not reduce in the Uruguay Round the tariffs that they actually applied. Their commitments were to reduce the gap between the bound (i.e. the upper ceiling) and the applied rates (the “tariff overhang”) by pledging to keep within the lower bound rates. However, what firms actually face in practice are the applied tariffs, which are very different from the bound rates, especially in developing economies.

For the developed countries in their sample, Feinberg and Reynolds (2007) find that commitments to reduce tariffs under the Uruguay Round are associated with less frequent AD activity. According to the authors, this surprising result may reflect a move towards alternative measures of protection, such as TBT and SPS measures. It may also be attributable to a host of omitted variables, such as the increasing importance of services and FDI, which could have diverted the attention of firms in these economies away from the AD instrument (Feinberg and Reynolds, 2007). Given the limitations of the study described above, it is difficult to identify a causal impact of tariff reduction commitments under the Uruguay Round on AD activity.

More recently, using data for 35 countries (29 developing and six developed countries) over the

period from 1991 to 2002, Moore and Zanardi (2011) also examine the relationship between sectoral trade opening and subsequent AD initiations.⁵⁴ Unlike Feinberg and Reynolds (2007), however, the authors analyse applied rather than bound tariffs. Furthermore, they take account of additional factors that may affect AD initiations, include a larger set of importing and exporting countries. They also cover a longer time span, work with more disaggregated industrial sectors and use a more complete AD database.

In general, Moore and Zanardi (2011) find that reductions in applied tariffs do not lead to a higher probability of AD petitions. However, for a small group of developing countries that have become heavy users of AD in recent years, they do find evidence of policy substitution – a statistically significant impact of trade opening on the probability of AD filings. For this sub-sample, a one standard deviation increase in tariff liberalization results in about a 25 per cent increase in the probability of observing an AD initiation. The absence of a statistically significant “substitution effect” for other developing countries or for the six developed countries in the sample may be due to the fact that the former initiated relatively few AD petitions while the latter already had very low tariff rates over the entire period covered in the analysis.

The results of Moore and Zanardi (2011) are reinforced by the recent work by Bown and Tovar (2011) on the trade reforms undertaken by India in the 1990s. They find that taking other factors into account, products that underwent larger tariff cuts as a consequence of the trade reform were, by the early 2000s, subject to an increase in the use of safeguards and AD measures. In particular, they show that the probability of initiating an AD investigation and safeguard proceeding is 50 per cent higher as a result of a one standard deviation increase in trade opening.

The Specific Trade Concerns (STCs) databases created by the WTO Secretariat (discussed in detail in Section C.1) have been used to shed new light on whether applied tariffs and TBT/SPS measures may have been used as substitutes over the period 1995-2010.⁵⁵ Applying an analysis similar in spirit to Kee et al. (2009) – who seek to identify a “clean” correlation between tariffs and their estimated *ad valorem* equivalent of non-tariff measures,⁵⁶ rather than identifying a causal link – the results indicate some evidence that TBT measures may have been used to take the place of tariffs, but there is very limited evidence of substitution between tariffs and SPS measures (see Box B.6). This result is in line with expectations: SPS measures cover a relatively narrow area of health and safety that is often directly related to consumer protection and may offer less scope for policy substitution than the wider set of TBT measures.

Box B.6: Policy substitution – evidence from specific trade concerns

From the Specific Trade Concerns (STCs) databases, coverage ratio (the amount of trade covered by an SPS or TBT measure) and frequency ratio (the share of product lines covered) have been computed. Frequency and coverage ratios are inventory-based measures that do not necessarily capture the trade restrictiveness of a measure. However, they indicate how much trade is affected by it.⁵⁷ These measures have been computed for each combination of maintaining country (the country that maintains the measure subject to the specific trade concern), HS2 sector (a two-digit classification in the Harmonized System) and year. To analyse whether there is evidence of substitution between tariffs and SPS or TBT measures, the following econometric model has been estimated:

$$y_{ijt} = \beta_1 \ln(\text{tar})_{ijt} + \varepsilon_{ijt}$$

where y is the (log of) the coverage ratio (or the frequency index) of the maintaining country i in HS2 sector j in year t , and tar is the (log) average applied tariff in sector j . Year, country, sector and country-sector fixed effects have then been progressively added to this baseline model.

As argued in the main text, the estimated regression does not purport to identify a causal link, but rather a “clean” correlation between tariffs and TBT or SPS measures. It is similar to the one estimated by Kee et al. (2009), who find evidence of substitution between tariffs and non-tariff measures when considering the variation within country and within sector. In contrast to Kee et al., there is also time variation in the STC databases, allowing the user to identify variation within country-sector and time using a richer set of fixed effects than Kee et al. (2009).

Table B.1 reports the results of the regressions. In columns (1) (for the coverage ratio) and (5) (for the frequency index), no fixed effect is included. In columns (2) and (6), country and time fixed effects are added. In columns (3) and (7), sector fixed effects are added. Finally, in columns (4) and (8), there are time and country-sector fixed effects.

The upper panel of the table presents results for the SPS specific trade concerns. The coefficient on the tariff is negative (as it would be if SPS measures and tariffs are substitutes) but not always significant. In particular, it is not significant for the coverage ratio in the preferred specification with the time and sector-country fixed effects (column (4)). Overall, there is little evidence that tariffs and SPS measures substitute each other.

The results of the regressions with TBT concerns, however, reveal a clearer pattern of substitution between tariffs and TBT measures (see bottom panel of Table B.1). As in Kee et al. (2009), the coefficient turns from positive to negative as more fixed effects are included. It is negative and statistically significant – both in the regression using the coverage ratio and in the regression using the frequency index as dependent variable – when time and country-sector fixed effects are included (see columns (4) and (8)).

In conclusion, the use of less efficient non-tariff measures instead of tariffs is facilitated by the fact that while bindings on import tariffs are rigid, the explicit disciplining of NTMs within the framework of international trade agreements is more difficult because they are less transparent. In addition, certain NTMs can be used to address a legitimate public policy concern (health, the environment, etc.), thereby making it possible to conceal a potentially protectionist intent behind the measure. However, is it the case that governments choose to exclude NTMs from such international agreements? And, if so, what determines this choice?

The trade literature suggests a number of possibilities. The decision to exclude may simply reflect the costs of writing and enforcing an agreement that covers a wide range of behind-the-border non-tariff measures (Horn, 2006; Horn et al., 2010). It may also be attributable to uncertainty about the circumstances that will prevail during the lifetime of the agreement, thereby making it

difficult to foresee all regulatory needs that may arise (Battigalli and Maggi, 2003). There are further possible explanations.

The non-explicit regulation of non-tariff measures may represent “escape clauses” for members of the agreements – providing them with the flexibility required to maintain a self-enforcing agreement in a volatile world (Bagwell and Staiger, 1990). It may even be the case that governments can improve their bargaining power *vis-à-vis* special interest groups by committing to constrain tariffs through international agreements, and then using less efficient NTMs instead (Limao and Tovar, 2011). Finally, countries may want to retain policy space in issues they consider to be “too important” to be subject to trade rules, e.g. national security. An analysis of such factors that may explain the “endogenous determination” of the coverage of NTMs in international trade agreements is carried out in Section E.

Table B.1: Coverage ratio and frequency index of STCs and tariffs								
SPS								
Dependent variable	Coverage ratio (ln)				Frequency index (ln)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Tariff (ln)	-0.00847 (0.00886)	-0.0250 (0.0159)	-0.0911*** (0.0143)	-0.0256 (0.0242)	-0.0444*** (0.00909)	-0.0125 (0.0155)	-0.0906*** (0.0139)	-0.0598*** (0.0193)
Fixed effects:								
Country	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Sector	No	No	Yes	Yes	No	No	Yes	Yes
Time	No	No	Yes	Yes	No	No	Yes	Yes
Country*sector	No	No	No	Yes	No	No	No	Yes
Observations	3,259	3,259	3,259	3,259	3,259	3,259	3,259	3,259
R-squared	0.000	0.160	0.337	0.279	0.006	0.223	0.431	0.330
Number of id					223			
TBT								
Dependent variable	Coverage ratio (ln)				Frequency index (ln)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Tariff (ln)	0.0215*** (0.00308)	0.00642 (0.00417)	-0.0126*** (0.00453)	-0.0439*** (0.0113)	0.0234*** (0.00334)	0.0150*** (0.00425)	-0.00512 (0.00460)	-0.0394*** (0.0123)
Fixed effects:								
Country	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Sector	No	No	Yes	Yes	No	No	Yes	Yes
Time	No	No	Yes	Yes	No	No	Yes	Yes
Country*sector	No	No	No	Yes	No	No	No	Yes
Observations	9,788	9,788	9,788	9,788	9,788	9,788	9,788	9,788
R-squared	0.005	0.084	0.170	0.107	0.005	0.100	0.185	0.108
Number of id					657			

Notes: Robust standard errors in parentheses; *** p<0.01; columns (4) and (8): within estimation, id variable: country-sector.

Source: WTO Secretariat estimates.

3. Measures affecting trade in services

(a) Why a separate discussion?

Cross-border delivery alone does not fully capture international services transactions. The intangible and non-storable nature of many services implies that suppliers and consumers often have to be in physical proximity for services provision to take place. Indeed, trade in services takes place through four different “modes of supply”: beyond the traditional cross-border mode, it encompasses the consumption of a service in a foreign territory and the movement of the supplier abroad, either to establish a commercial presence or in person. As a result, capital and labour mobility is often inextricably linked to services trade.

Against this background, measures affecting trade in services warrant a separate discussion for at least three, related reasons.

First, the feasibility of applying a tariff, and an *ad valorem* tariff in particular, to the international provision of services is remote. In most instances, it will be next to impossible for customs officials to observe a service “crossing a border”, and the value (volume) of a services transaction will only be known after the relevant service has been produced or consumed (Hoekman and Primo Braga, 1997). Trade protection in services is thus essentially in the form of regulatory measures.⁵⁸ In a literal sense, all limitations to services trade are “non-tariff”. Thus, it makes no sense to discuss why non-tariff measures are used and to analyse their economic and trade effects in juxtaposition with tariffs as, in the case of services, tariffs are not strictly available.

Secondly, an analysis based on whether measures are applied *at* or *behind* the border is also largely unhelpful. Many services transactions involve the presence of either the supplier or the consumer inside the territory of the “importing” country. Hence, services restrictions mostly apply “behind-the-border”.

Thirdly, given the modal definition of services trade, the analysis needs to include measures applying both to the product (i.e. the service) and to the producer (i.e. the services supplier). Furthermore, the producer may be physically present in the territory of the importing country. While in the case of goods, factor movement represents a substitute for cross-border trade, with many services it is a precondition, or an important complement, for any trade to take place. All measures that govern how services are produced and consumed in an economy are thus potentially measures affecting services trade. This is why measures discussed here that might appear to go beyond traditional “trade” instruments need to be factored in when considering services trade.

While it would be impracticable to lump together a discussion of services measures and non-tariff measures, this does not imply, however, that services and goods trade, and the respective trade limitations, should be considered in isolation. Not only are trade in goods and trade in services mutually supportive,⁵⁹ but also many services trade restrictions affect goods trade, and vice versa.

Services play a key role in supporting production networks. Transport and logistics services are obviously the most important direct services input to international goods trade, but communication, insurance and banking are also key enabling services. A prominent role is additionally played by distribution, business and other after-sales services such as repair and maintenance.

Measures that restrict trade and competition in services markets thus affect not only the economic performance of the sector concerned, but may, particularly with infrastructural services, also have spillover effects on the economic and export performance of goods and other services industries (see discussion in Box D.3).⁶⁰

Restrictions on trade in certain goods may impair the efficiency and export competitiveness of services suppliers that rely on those particular products as inputs. Restrictions on the importation of certain medical equipment may raise costs for hospitals when providing related medical services to national and foreign patients, for instance. Measures raising the cost of imported consumer goods would likewise negatively affect retailers, and particularly foreign retailers sourcing many of their products from their home country.

Such cross-effects are especially important in light of the growing fragmentation of production processes across countries. As much as three-quarters of services trade is in intermediate inputs (Miroudot et al., 2009), while intra-firm trade accounts for 22 per cent of US services imports and 26 per cent of its services exports (Lanz and Miroudot, 2011).⁶¹ Together, these

data do indeed paint a picture of services trade as a prominent, though probably still underestimated, component of global or regional value chains.⁶² In light of their spillover effects beyond the industry concerned, restrictions to trade in such “intermediate” services can be argued to be of even greater significance.

Similar to the analysis of non-tariff measures for goods trade, this section will first discuss the motivations for governments’ intervention in services markets. It will then try to categorize the main forms of intervention used and, to the extent possible, examine their economic and trade effects.

(b) Why do governments intervene in services markets?

This section discusses why governments may intervene in services markets. To a large extent, the analysis in sections B.1(a) and 1(b)(ii) above remains pertinent. A number of services-specific characteristics, however, need to be factored in.

(i) *Public interest considerations*

From a public interest theory standpoint, government intervention in services markets may be justified on efficiency grounds, as well as on equity considerations. Efficiency concerns relate primarily to the existence, in many services industries of instances of market failure, such as asymmetric information (i.e. one party having more information than the other), imperfect competition and externalities (see below).⁶³ While these failures also appear in goods industries, they seem to be more pervasive in the case of services. The discussion that follows is largely illustrative.

Instances of asymmetric information in services are frequent. This is, essentially, because of the intangible nature of many services. Immateriality implies that consumers cannot easily assess the quality of a service before consuming it. Producers will tend to be better informed. However, they might not have an incentive to supply more information to consumers, as this might be costly to provide, or retaining information may afford a commercial advantage. At the same time, consumers may lack the expertise required to assess much of the technical information they receive. As a result, consumer choice is insufficiently informed for competition to function effectively. This problem is accentuated by the fact that repeat purchases may not always be an avenue to discipline producer behaviour. Services, by their nature, tend to be much more diverse than goods. Consumers may not be willing, or able, to continually purchase identical services.

Though market-based solutions could see producers signalling a commitment to quality, for instance by investing in reputation, customer service, brand name or easily accessible complaint procedures, they are

unlikely to be sufficient for high-risk activities (Pelkmans, 2006). Governments thus often intervene to curb services suppliers from exploiting information asymmetries. As it is generally impossible to impose, verify and ensure compliance with performance requirements by focusing exclusively on the service, governments frequently intervene at the level of the supplier. They may, for instance, require producers to disclose certain information to consumers, or impose qualification or licensing requirements that seek to ensure the competence of the services supplier and thus the quality of the services provided.

Information asymmetries may also be problematic for producers where consumers possess private information, for example about their health status. A lack of generally available information may also engender situations of “moral hazard”. For example, where someone other than the consumer bears the full responsibility and consequences of his actions, excessive consumption may result. Insurance markets are a case in point.

Imperfect competition is another market failure often encountered in services industries. Many services are supplied through networks: telecommunications, postal services, electricity distribution, environmental and rail transport services are prominent examples. Standardized services provided over such infrastructure or distribution networks often exhibit such large economies of scale that the relevant market can be served most cheaply by a single or small number of firms, i.e. they are often naturally monopolistic/oligopolistic. Unchecked, these markets result in under-supply and prices set above marginal cost. Government intervention is thus warranted, and may imply instituting price controls or enabling competition (e.g. through unbundling services, regulating access to essential facilities, franchising and concessions).

Finally, both negative and positive externalities occur in service markets when the price of a service does not reflect the true cost or benefit to society of producing that service. This results, respectively, in excessive or insufficient consumption. The environmental consequences of heavy road transport or intensive tourism are instances of negative externalities. Network expansion in telecommunications services, increased investment in education or vaccination programmes, on the other hand, are examples of positive externalities.

Government intervention in services industries may also be driven by equity considerations. Many services are inputs into human capital development and, as such, they underpin governments’ social objectives. Health and education services are typical examples, but similar considerations may also play a role in sectors such as audio-visual, telecommunications, transport, energy and water services. Unfettered

markets would leave certain geographical areas or groups of consumers without affordable prices or adequate supply. The imposition of “universal services obligations” has been one government response to counter these problems.

Box B.7 provides some sector-specific examples of services measures that governments may use to address efficiency and equity concerns.

(ii) Political economy considerations

According to the economic theory of regulation, government intervention is not driven exclusively by the pursuit of the “public interest”, but rather, or additionally, by the concerns of special interest groups. Governments may therefore intervene irrespective of the existence of a market failure. Even when intervention is warranted on public policy grounds, governments may still, in deciding which instrument to employ, be “bought” into relying on those measures that benefit more organized groups, generally domestic (or incumbent) producers.

While the discussion in Section B.1 remains pertinent, when it comes to services industries, political economy considerations are particularly significant in at least four respects.

First and foremost, the most transparent form of intervention when it comes to trade policy, i.e. a tariff, is not available in services markets. By definition, governments need to resort to other, often more opaque instruments. This offers greater scope to mask any private interest motivations, and thus potentially reduces the risk of electoral punishment.

Secondly, much less scientific evidence exists on which services intervention might be based and its effectiveness tested. The diverse nature of many services, their intangible nature, and the frequent need to regulate at the producer level all imply that regulation tends to be not only complex, but also much more difficult to assess on the basis of exact criteria applied at the product level. This may, once again, help camouflage governments’ true intentions.

Thirdly, the complexity of much services regulation implies that regulators who are less experienced or less resourced might be more easily “captured” by special interest groups even if they intend to act in pursuit of the “public interest”. Given such information asymmetries, protection might not even need to be “bought”.

Fourthly, given the equity and social concerns attached to many services, consumers might actually side with domestic producers. Consumers may misguidedly fear that, if the interests of domestic producers are no longer upheld, service quality will suffer and/or prices will increase (Hoekman et al., 2007).

Box B.7: Examples of services-specific measures to pursue public policy objectives*Equitable access*

In the transport or telecommunications sectors, governments often want remote regions to be served by such services regardless of profitability. Basic equity objectives also prompt governments to ensure that all citizens have access to education and essential health care at low or zero costs.

Measures include cross-subsidization schemes to ensure that revenues in profitable areas are reinvested in favour of under-developed regions or persons in financial need and licensing conditions which include universal services obligations (for example, commercial hospitals are required to treat a certain percentage of patients free of charge).

Consumer protection

With regard to professional, financial or health services, the complexity of the service that is provided makes it very difficult for consumers to appreciate quality or safety prior to consumption. Services suppliers may exploit such information asymmetries.

Measures include prudential and other technical standards to be complied with by services suppliers; publication requirements on costs, risks, side-effects, etc., so as to enable the consumer to make informed decisions; education and training requirements to ensure competence; and mandatory professional liability insurance.

Reduction of environmental impacts and other negative externalities

Road and air transport cause pollution and noise; tourism could put the environment under stress and disturb natural habitats, etc.

Measures include traffic restrictions over weekends, during night hours or in sensitive areas; zoning laws and building codes; tax/subsidy schemes to mobilize funds for the preservation of cultural heritage.

Macroeconomic stability

Financial institutions may engage in imprudent lending or design complex financial instruments that are insufficiently understood. As a consequence, depositors may lose confidence and withdraw their money, inter-bank lending may suffer, credit supply to the real economy may be hampered, and so forth.

To ensure stability, financial institutions must comply with measures such as minimum capital requirements and higher capital reserves when new financial instruments are provided. They must also diversify assets to limit exposure to individual clients, report on their activities, or put limits on remuneration of management.

Avoidance of market dominance and anti-competitive conduct

Concerns about anti-competitive conduct arise in sectors prone to market concentration (including services with network effects and interconnection needs, such as transport and telecommunications, and liberalized former monopolies).

Measures include limitations on market shares, introduction of price surveillance or mandatory price caps, interconnection guarantees, and government-mandated technical standards to replace company-specific requirements.

Source: World Trade Organization (WTO) (2005a)

(iii) Pervasiveness of government intervention

Services industries exhibit hugely different characteristics and market structures. There is a broad

range of sectors in which governments play no specific role. Nonetheless, it is widely acknowledged that, given the greater likelihood of market failures and the potentially bigger role played by private interest considerations, government intervention in services

markets as a whole is more prominent than in goods markets.

The form of this intervention has changed over time, however. Historically, several infrastructural and social services, especially those provided to the general public (traditionally called “public services”), were directly supplied by government entities, usually in monopoly situations. Recent decades have seen a move away from state ownership towards more reliance on private markets to provide these services. Governments progressively moved back from their role of suppliers and increasingly took on the role of regulators. Once such services were no longer publicly financed and provided, governments were forced to introduce new measures, with the stated objective of promoting economic and social welfare. Indeed, regulation of these services markets has expanded at the same time as the industries concerned have been privatized and opened up to competition.⁶⁴

(c) How do governments intervene in services markets?

This section highlights the main types of government measures that have an effect on trade in services. It only sketches broad contours. Given that the definition of trade in services includes services that are produced locally in the importing country, the scope of measures potentially impacting such trade is vast, ranging from corporate taxation to labour laws, to consumer subsidies, to land ownership provisions, and so on. The list is much longer than in the case of measures classified as non-tariff measures in a goods trade context.

The fact that a measure negatively affects trade in services does not imply that it should be automatically viewed as protectionist. On the contrary, as discussed above, governments often intervene in services markets in pursuit of a variety of public policy objectives that are unrelated to trade policy considerations. Their interventions might nevertheless raise the cost for services suppliers to enter/establish or operate in a market.

This section presents a typology of services measures and draws on the (limited) available literature to discuss to what extent such measures may be considered as trade restrictions.

(i) Types of services measures

As highlighted, the concept of “border” is not necessarily a helpful criterion when trying to categorize services measures. Francois and Hoekman (2010) classify services interventions according to whether they affect domestic and foreign services and services suppliers differently, i.e. are discriminatory, and whether they affect the ability of firms to enter/establish in a foreign market or have an impact on their operations (see Table B.2).

Such a classification, which is based on the effect of the measures, captures virtually all forms of government intervention in services markets. It is also helpful in that it enables a rough distinction between measures that usually reduce the number of suppliers in a market (i.e. those related to market entry/establishment), and thus the quantity supplied at a given price, and measures that raise costs once a market is entered into (i.e. those that impact operations) and result in a given quantity being supplied at a higher price.

It also helps to highlight that services interventions comprise measures that affect in the same way foreign and domestic producers seeking access to the domestic market. Measures impacting either entry or establishment in a non-discriminatory fashion may protect national, or incumbent, suppliers, at the expense of foreign or new domestic suppliers. In this regard, some of the measures under discussion may actually be restrictive to competition generally, rather than to “foreign competition”, i.e. trade.

Thus, what matters for services trade is not just the removal of discriminatory measures but the contestability of the market. Even in a situation where all discriminatory measures were removed, a sector would still remain highly restricted if only a fixed number of suppliers were permitted to operate. Though there would be no discrimination in favour of nationals, the entry of any new supplier to the market, be they foreign or domestic, would still be constrained.

Alternative classifications have also been proposed. They focus more on the type of instrument being used, rather than its effects. Hoekman and Primo Braga (1997), for instance, distinguish between four main categories: (i) quotas and local content requirements; (ii) price-based instruments; (iii) standards, licensing and procurement; and (iv) discriminatory access to

Table B.2: Typology of measures affecting services trade

	Measures impacting entry/establishment	Measures impacting operations
Non-discriminatory	Restriction on the number of licences for pharmacies, for example	Reserve requirement for banks, for example
Discriminatory	A limit on the number of foreign architects, for example	Higher port duties charged on foreign-flagged vessels, for example

Source: WTO Secretariat, based on Francois and Hoekman (2010).

distribution networks. Copeland and Mattoo (2008) propose a fairly similar classification. These classifications, which are more akin to those employed to classify non-tariff measures applying to goods trade (see Section B.1), appear better suited to analyse the economic effects of the various measures, precisely because available literature borrows heavily from traditional (i.e. goods) international trade theory.⁶⁵

One instance that is not captured by either classification is when trade is affected by the absence, rather than the presence, of a measure. For example, as discussed for non-tariff measures, when there is significant uncertainty about the quality of a service, demand for (and trade of) the service concerned might only increase if certification requirements for suppliers are introduced as these help raise consumer confidence. Instances of natural monopolies or oligopolies provide a further case in point. Unless pro-competitive measures are introduced, dominant incumbent suppliers can, through their control of essential facilities, obstruct access to the market (Mattoo and Sauv , 2003).

(ii) When is a measure a trade restriction?

Much services regulation pursues public policy objectives. Nevertheless, such regulation may unintentionally also have trade-restrictive effects. Or, at the same time as aiming at domestic efficiency or social equity objectives, it might be captured by special interest groups to protect domestic suppliers at the expense of consumers. Economic policy considerations may also lead to services measures being used exclusively for protectionist purposes. They may further affect the choice, among all possible alternatives, of particularly inefficient policy instruments.

Given the pervasiveness of services regulation and its commingling with trade protection a clear identification of which measures are trade restrictions, or a neat separation of the protective component in such measures, is fraught with difficulty. As Copeland and Mattoo (2008) observe, the trade-related implications of services measures depend on the specific characteristics of the service industry in question, and particularly on the market imperfections such measures are designed to correct or equity objectives they are pursuing. Market structures differ widely among services sectors (Francois and Hoekman, 2010). Services trade includes transactions in highly contestable sectors as well as network industries characterized by large fixed costs of entry, for instance. The trade effects of services measures can thus be expected to be different in these two types of industries.⁶⁶

Indeed, at the sectoral level, a great deal of literature is available that assesses the relative efficiency of different regulatory measures in attaining specific public policy goals. Though rarely explicitly trade-oriented, many findings lead to trade-relevant policy conclusions. At a

general level, however, very little analysis seems to have been undertaken on the relative efficiency of services measures. Nevertheless, the limited literature that is available does point to some broad observations. The following discussion is organized around the typology of services measures in Francois and Hoekman (2010), complemented by an instrument-based classification. It addresses first discriminatory measures, and then non-discriminatory ones.

First, discriminatory measures that impact either entry/establishment or operations place foreign services and suppliers at a competitive disadvantage relative to domestic services and suppliers. They can be considered trade restrictions almost by definition. They include "traditional" trade measures, such as quantitative restrictions, that impact foreign entry/establishment, and discriminatory taxes or subsidies that affect the cost of foreign suppliers' operations.

International trade theory suggests a ranking of such instruments of protection for goods trade (see Section B.1). If the objective of a policy is to expand the output of an import-competing industry, output subsidies can be shown to be a superior instrument to tariffs, and tariffs normally superior to quotas. As Hindley (1988) indicates, this ranking should, in principle be as valid for services as it is for goods. Nonetheless, applying a similar analysis to services trade presents a number of challenges, as Mattoo (2003) highlights. First, tariffs are not necessarily a feasible option for services. Secondly, measures that may have tariff-like effects in terms of raising foreign costs per unit of output are not tariff-like when it comes to generating revenue. Thirdly, and most significantly, the modal definition of services trade implies the possibility that trade restrictions will bring about mode-switching and that factor movements will directly affect market structures.

Tariff-like measures that do not produce any revenue would imply a much greater loss in national welfare than a straight tariff if income from quotas (i.e. quota rents) does not accrue domestically.⁶⁷ Generally speaking, quota rents accrue to the owners of the right to import the product in the domestic economy. In the case of services, foreign suppliers generally sell their service directly to domestic consumers, so they are much more likely to collect the quota rents than in the case of goods. Additionally, quotas are often associated with wasteful administration and rent-seeking activities, including corrupt practices, that push their social cost above that of tariffs. In imperfectly competitive markets, quotas are shown to be even more wasteful (Copeland and Mattoo, 2008).

If trade is possible through only one mode, a limitation on that mode may render the service concerned non-tradable. If modes can be substituted for each other, a prohibitive restriction may not have much effect if the unconstrained mode is the most efficient one (Francois

and Hoekman, 2010). If, however, it is not the first-best option, the switch to the alternative mode may result in deadweight losses induced by trade diversion (though possibly moderated by lower price increases than in the case where this mode-switching option was not available). Thus, any benefits resulting from the multiple modes of services provision at the disposal of suppliers faced with a trade restriction need to be weighed against the additional cost to the importing economy of acquiring the service through a relatively inefficient mode (Copeland and Mattoo, 2008).

For those services where cross-border delivery is not feasible, limitations to entry on foreign investment imply that the price and quality of the services concerned are determined exclusively by the domestic market structure. These restrictions on foreign direct investment (FDI) generally take the form of either entry quotas and/or restrictions on foreign equity participation. While the latter restrictions may prevent transfers of technology, skills and know-how, the former have been shown to be more socially wasteful. Foreign FDI might be attracted by returns to investment that have been artificially raised by restrictions on competition and the true social productivity of the investment may thus be lower than the returns to the investor (Mattoo, 2003).⁶⁸

As for non-discriminatory measures, limited theoretical and empirical work has been undertaken on these measures at a general level on the part of trade economists. This is most probably a consequence of their primarily domestic nature. Literature relating to the economic effects of non-discriminatory restrictions to entry in individual sectors is more readily available, but a review of this literature would be beyond the scope of this report.

Nevertheless, it is possible to point to some general observations. First, non-discriminatory measures affecting entry/establishment, most notably quantitative restrictions, would seem to be difficult to justify on efficiency grounds, as Hindley (1988) and Copeland and Mattoo (2008) argue. By protecting incumbent suppliers from competition, such entry limitations reduce market contestability. They have on occasion been defended for infant-industry type reasons and the fulfillment of universal services obligations through cross-subsidization. However, alternative means have been shown to achieve the same objectives without the need to restrict competition, so that entry limitations are at best second or third-ranking alternatives.

Secondly, non-discriminatory measures that impact suppliers' operations would seem to be the services measures furthest removed from protectionist purposes. Even when they are pursuing public policy goals, however, they may, intentionally or otherwise, have spillover effects on trade. For instance, Copeland and Mattoo (2008) observe that, though responding

primarily to problems of asymmetric information, certification requirements for professionals have trade and welfare effects that may vary depending on the screening mechanisms chosen. Moreover, such measures might yet again affect supply patterns by inducing suppliers to switch to alternative modes of trading services (Delimatsis, 2008).

As such, a crucial challenge posed by these measures is how to distinguish between when they are used exclusively for public policy objectives and when they are also being used for protectionist purposes (see Section E.2). Mattoo and Sauv  (2003) argue in favour of a "necessity test". Such a test would enable governments to attain their chosen economic and social objectives, but to do so in a manner that does not "unnecessarily" restrict trade. They contend that such a test would encourage the use of the most economically efficient measure among those available to remedy a market imperfection and pursue non-economic goals.

The ranking of instruments of protection in services trade that emerges from economic theory is, to a large extent, reflected in the General Agreement on Trade in Services (GATS). By design, and as discussed in more detail in Section E, the GATS distinguishes broadly between three types of services measures: those that restrict entry/establishment, whether discriminatory or not; measures that are discriminatory, modifying the conditions of competition in favour of national services and services suppliers; and measures that are non-discriminatory and non-quantitative in nature. The first two types of measures (essentially market access and national treatment limitations as defined in GATS Articles XVI and XVII, respectively) are subject to negotiations to progressively eliminate them. The third type of measures ("domestic regulation") are not considered trade restrictions as such, but the GATS acknowledges that they may nevertheless have trade-restrictive effects and mandates the establishment of relevant disciplines under Article VI:4.

4. NTMs in the 21st century

This section describes how recent or foreseeable changes in the trading environment have affected or may affect governments' use of non-tariff measures and services measures. This allows us to illustrate the practical difficulties involved in dealing with measures pursued for public policy reasons and the trade impact of such measures. Examples include measures taken in the context of the recent financial crisis, policies in relation to climate change and measures addressing food safety concerns.

(a) NTMs, services measures and the recent financial crisis

Economic crises typically result in the implementation of economic stimulus measures by governments.

The use of non-tariff measures is a part of such crisis-induced government intervention. The recent financial crisis, which has had an impact on the use of NTMs by governments worldwide, is a case in point. In this section, an analysis of the NTMs implemented in the wake of the crisis will enable us to illustrate the practical difficulties involved in distinguishing between measures taken for public policy reasons and those that constitute disguised protectionism. This section will also discuss how recent changes in the trading environment brought about by the financial crisis may affect governments' use of NTMs in the future. It emphasizes that better monitoring of non-tariff measures, which ensures greater transparency in their use, is imperative in preserving consumer interests and preventing a proliferation of protectionist measures. It also alludes to the fact that in situations where governments have a preference to protect domestic industry, a monitoring mechanism needs to be accompanied by legally enforceable rules (that enable retaliation if an agreement is violated) to limit the use of trade-distorting NTMs.

(i) The recent financial crisis: attributing motive to the use of NTMs and services measures

It is well-established that the origin of the recent financial crisis can be traced to institutional failures in the regulation of financial systems at a national level. Its effects were then transmitted across many countries through international trade and finance linkages. In response to the crisis, subsidies, in the form of direct funding, special loans and guarantees, were provided to bail out a number of financial institutions in various advanced economies (Baldwin and Evenett, 2010). These "emergency" measures in the financial sector were associated with public policy objectives; they were deemed necessary to stem the spread of systemic damage and help restore the normal functioning of financial markets – critical for both consumers and producers across the world.

A number of countries also introduced subsidies to encourage consumers to buy specific products through, for instance, refunding a certain amount of the purchase price. For example, the Consumer Assistance to Recycle and Save (CARS) Act of 2009 in the United States – referred to as the "cash-for-clunkers" programme – provided credits to consumers who traded in old, fuel-inefficient vehicles when buying or leasing new, more fuel-efficient vehicles (Congressional Quarterly, 2009). Such consumer subsidy schemes, implemented in a number of other advanced economies including Germany, France and the United Kingdom, were used as measures to stimulate domestic demand – once again, a public policy objective. Moreover, they were non-discriminatory internationally.

In times of economic recession, however, high levels of unemployment can result in governments resorting to non-tariff measures and services measures that discriminate against imports competing with "like" domestic products. Hence, as highlighted earlier, it often becomes difficult to distinguish practically between measures taken for public policy reasons (although their imposition may have adverse trade effects) and those that constitute disguised protectionism. This ambiguity in government motivation is further complicated by the increased importance of intermediate goods trade in global supply chains (Hummels et al., 2001; Koopman et al., 2010). For instance, consider the industry-specific subsidies introduced by a number of developed economies to assist their struggling automotive industries during the recent crisis. This is potentially trade-distorting for the final product market in the short-run. However, it is possible that by disrupting an established global supply chain, their collapse would have led to a substantial decline in world intermediate goods trade, thereby resulting in significant job loss among several countries over the medium-run.

Identifying the motive behind non-tariff measures and services measures becomes especially important in a crisis situation because it can easily lead to beggar-thy-neighbour policies, i.e. trade-restrictive actions taken by one country can trigger similar actions by other countries, leading to a spiral of ever more threatening restrictions. Consider, for example, subsidies to financial institutions. If bailout funds are conditional on financial service firms redirecting lending towards the home market, this may be seen as discriminatory despite the apparent prudential concerns. The same holds true if subsidies are conditional on the purchase of a domestically produced product.

(ii) Impact of the recent crisis on future use of NTMs and services measures

Monitoring and coordination

The recent crisis may affect governments' use of non-tariff measures and services measures in the future. Earlier in the section, we argued that the increased incidence of NTMs may be linked, in part, to the fact that they are less transparent than border measures such as tariffs, and hence harder to discipline under international agreements. An outcome of the recent crisis was the revival of the WTO's trade monitoring mechanism in October 2008 (see Section C.1).⁶⁹ The revival of this monitoring mechanism represents an advance in addressing transparency in the use of NTMs and services measures. It can act as a communication device to solve a coordination problem that leads to excessive protectionism, via the use of such measures. In the following hypothetical example of how this might work, it is assumed that governments prefer open trade policies to protectionism (see Table B.3).

Given the payoffs specified for two trading partners in the above table, there are two equilibria. If country 1 resists protectionism through non-tariff measures, for instance, country 2's best response is also not to restrict trade (and vice versa). If, however, country 1 is imposing trade restrictions, country 2's best response is also to impose similar restrictions (and vice versa). This reflects a beggar-thy-neighbour policy – if, for example, country 1's exporters cannot compete on a level playing field in country 2, the government of country 1 would not want the country's firms to also lose out on domestic market share to import competition from country 2. For both countries, the first equilibrium outcome is preferable to the second. But if the two are unable to communicate and coordinate their actions, they may end up with the less preferred equilibrium outcome. Hence, by improving the transparency of NTMs, WTO's monitoring mechanism can guide members to a better welfare ("Pareto-superior") outcome.

Of course, it may be the case that governments prefer to protect their domestic industry. If so, the strategic interaction between governments is not simply a coordination game – the payoffs presented in the previous hypothetical example would change. Suppose one country chooses "no protectionism", the other would want to choose "protectionism" as it would get full market access to the former without having to open up to competition itself. Table B.4 reflects this argument with relevant payoffs for the two countries. It shows that the situation is representative of what is known as a prisoner's dilemma game, whereby both parties are motivated by the fear of what the other might do.

Given the payoffs specified for two trading partners in the above table, the equilibrium is both countries choosing the strategy of protectionism. Unlike the coordination game, however, a monitoring mechanism that helps the countries to communicate with each other would not be sufficient to guide them to a better welfare outcome where both choose the strategy of no protectionism. This is because despite the communication, each country would have an incentive to defect from their agreed upon strategy, fearing that the other might do so. Hence, along with a monitoring mechanism, legally enforceable rules – that enable retaliation in the event either country violates an agreement of choosing "no protectionism" – would be required to control the use of trade-distorting non-tariff measures and services measures. It is worth noting, however, that during the recent financial crisis,

governments of both advanced and developing economies have reaffirmed their faith in the multilateral trading system with repeated pledges to guard against protectionist policies.

Measures in the financial services sector

Given that the origin of this economic crisis lay in a financial crisis, it is likely to affect governments' future use of measures in the financial services sector, which may affect international market access. The literature identifies the heterogeneity of regulatory practices as a major constraint on services trade (see Section D). The recent financial crisis may affect the motivation of governments to pursue regulatory convergence in the financial services sector due to the reasons outlined below.

First, the recent crisis was anchored in advanced industrialized nations – those perceived to have relatively sophisticated regulatory regimes. In fact, certain developing economies may associate the activities of some foreign financial operators with what they perceive to be legitimate macro-prudential concerns. Secondly, unlike several developed economies which are associated with highly liberalized capital accounts, those which maintained greater restrictions on capital transactions and took a stricter stance on financial leverage appear to have weathered the storm better (Delimatsis and Sauvé, 2010). Thirdly, global liquidity growth, induced by expansionary macroeconomic policies implemented across the globe during the recent crisis, resulted in a surge of capital flows to emerging economies. This has compounded concerns about the intrinsic volatility of short-term capital flows, thereby giving developing countries an additional reason to ring-fence their economies against a sudden reversal (Sidaoui et al., 2011).

(b) NTMs and climate change

(i) *The future scenario*

The Durban Climate Change Conference in December 2011 ended with a commitment ("Durban Platform for Enhanced Action") to work towards a new global treaty to replace the Kyoto Protocol by 2015 at the latest and to establish a new climate fund (the "Green Climate Fund") to help poor countries both mitigate and adapt to climate change. Two years earlier, the UN Climate Change Conference in Copenhagen established a target to keep the increase in global temperature from pre-industrial times below 2 degrees Celsius.

Table B.3: Coordination game

		Country 2	
		No protectionism	Protectionism
Country 1	No protectionism	(2, 2)	(0, 0)
	Protectionism	(0, 0)	(1, 1)

Table B.4: Prisoner's dilemma game

		Country 2	
		No protectionism	Protectionism
Country 1	No protectionism	(2, 2)	(0, 3)
	Protectionism	(3, 0)	(1, 1)

A number of observers (Houser, 2010; Bodansky, 2010) saw that target under the Copenhagen Accord as a significant step forwards for the global community since the lack of an explicit long-term goal meant countries had no clear direction for national and international policy.⁷⁰ Furthermore, under the Accord both developed and developing countries notified emission reduction targets to the United Nations Framework Convention on Climate Change (UNFCCC).⁷¹

Nevertheless, both meetings fell short of expectations that they would produce binding mitigation commitments from both developed and developing countries. Without prejudging the outcome, should the negotiations on a post-Kyoto agreement prove protracted, what will likely emerge in the near term is a patchwork of regional and national climate change regimes with some countries implementing fairly strict mitigation measures, others taking no meaningful action, and a fair number of countries with policies that lie somewhere in between. This may lead to environmental and economic outcomes that countries would then try to manage through the use of non-tariff measures.

(ii) Carbon leakage and concerns about loss of competitiveness

Two related concerns are likely to deepen if no international agreement emerges about the specific actions that all countries need to take to tackle climate change. One is "carbon leakage" and the other is the possible loss in competitiveness of firms or industries in countries which take more stringent mitigation measures.

Carbon leakage refers to a situation in which reductions of greenhouse gas emissions by one set of countries ("constrained" countries) are offset by increased emissions in countries which do not take mitigation actions ("unconstrained" countries). Much of the discussion of carbon leakage has taken place in the context of the Kyoto Protocol where so-called Annex I countries (predominantly developed countries) had commitments to cut back on their emissions while non-Annex I countries (developing countries) did not.⁷²

The leakage can occur through a number of channels involving changes in international prices of energy and energy-intensive goods as well as the relocation of production. Basically, the mitigation measures in constrained countries reduce the production of energy-intensive goods and raise their international prices. The decrease in production of energy-intensive goods also reduces the demand for fossil fuels and leads to a drop in their prices. Unconstrained countries expand their production of energy-intensive goods in response to their higher international prices. The lower price of fossil fuels will also induce unconstrained countries to use more of it, thus increasing emissions.

Finally, energy-intensive industries may relocate from constrained countries to unconstrained countries.

However, there are also offsetting effects which need to be considered. The first one is the income effect from the increase in the price of energy-intensive goods (Copeland and Taylor, 2005). The same price change which drives unconstrained countries to increase production of energy-intensive goods increases their income. Assuming that environmental quality is a normal good, this income effect will prod them to take measures to mitigate emissions. The second effect that can counteract carbon leakage is innovation towards more energy-efficient means of production (Di Maria and Werf, 2008). The same price change responsible for carbon leakage also induces firms to devote more of their research and development (R&D) resources to find energy-efficient means of production. This is similar to the argument made by Porter and van der Linde (1995) that properly designed environmental regulations can spur innovation that may partially or more than fully offset the costs of complying with them.

Because of these possible offsetting effects, estimates of the magnitude of carbon leakage vary considerably although it is always greater than zero. The standard method of measuring carbon leakage expresses it as a ratio of the increase in CO₂ emissions of unconstrained countries and the reduction in the emissions of constrained countries. Most of the estimates of the global rate of carbon leakage vary between 5 per cent and 20 per cent (Sijm et al., 2004). However, much higher estimates reaching up to 130 per cent have been calculated (Babiker, 2005). Estimates of carbon leakage above 100 per cent imply that mitigation policies in the constrained countries are actually counter-productive since they lead to higher global emissions as production shifts to unconstrained countries that employ more emission-intensive technologies.⁷³

Unlike carbon leakage, there is no precise definition of competitiveness in the climate change literature. It might refer to the impact of the mitigation measures on firms' or industries' cost of production, profits, output, employment, or market share. These indicators have been variously employed in a number of studies to measure loss of competitiveness.⁷⁴ Notwithstanding this imprecision, the shift in production of energy-intensive goods from constrained to unconstrained countries, which is what makes leakage possible, captures the essence of this competitiveness concern.

(iii) Measures to address climate change, carbon leakage and loss of competitiveness

The need to mitigate climate change will spur many countries to take unilateral mitigation measures,

many of them falling in the list of non-tariff measures that have been discussed in this report. However, carbon leakage introduces a strategic dimension to constrained countries' mitigation efforts since they may consider it necessary to take into account "free-riding" by unconstrained countries which can dilute or reverse the effect of their mitigation actions. The free-riding refers to the argument that unconstrained countries bear no cost of mitigation efforts, yet assuming carbon leakage is less than 100 per cent they benefit from the reduction in global emissions due to the mitigation activity of the constrained countries. It is argued that trade measures provide a way for constrained countries to alter the incentives to free-ride on their endeavours.

Theoretical work exists on the effect of linking international environmental cooperation with trade (Barrett, 1994; Barrett, 1997; Botteon and Carraro, 1998). The basic insight from these studies is that the number of cooperating countries in an environmental accord would be larger and the agreement more stable (e.g. self-enforcing) if there are provisions for trade sanctions against non-members. In other words, using trade measures against non-cooperating countries can be an effective way of increasing the number of cooperating countries and of guarding against defection by currently constrained countries. As noted previously (in Section B.1), a number of international environmental agreements, namely the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and the Montreal Protocol, included provisions allowing for the use of trade measures.

Non-tariff measures that might be taken to mitigate climate change as well as to counter carbon leakage or to reduce the loss of international competitiveness by countries with stringent mitigation policies include border tax adjustments, subsidies, and regulatory measures (including TBT/SPS measures). There is by now a long list of papers that have examined the WTO consistency of these types of measures in the context of climate change. A partial list includes Bordoff (2009), Low et al. (2011), Pauwelyn (2007), and World Trade Organization (WTO) and United Nations Environmental Programme (UNEP) (2009). The following discussion will focus on the economic aspects rather than the legality or WTO-consistency of the measures.

Border adjustment measures

Border adjustment measures would impose costs on imports of emission-intensive goods commensurate with the costs of compliance with domestic emissions regulations. On the import side, border adjustments can take the form of a tax on imported products, or to a requirement for importers to purchase emission permits or allowances for those foreign products that they are importing. On the export side, border

adjustments can take the form of an export rebate, where exporters shipping items to unconstrained countries are compensated for the cost of complying with emission requirements. This discussion focuses on a domestic tax on imports since that has drawn more interest.

When constrained countries set their optimal policies, they will need to take carbon leakage into account, i.e. they will have to act strategically. Hoel (1996) shows that the first-best policy of constrained countries will be to impose a tariff on the emission-intensive import and apply a uniform carbon tax on both domestic and foreign emission-intensive goods.⁷⁵ The import tariff will be set so as to (i) shift the terms of trade in the importing country's favour and (ii) reduce demand for emission-intensive foreign goods. This second element reflects the constrained country's strategic recognition of carbon leakage and the need to respond to it.

If a country cannot freely adjust its tariffs, the second-best policy will require a non-uniform carbon tax, since it not only needs to reflect the social cost of emissions but also shift demand away from emission-intensive foreign goods.⁷⁶ There are two main challenges to implementing such a border tax adjustment. The first is the administrative difficulty of implementing such a scheme given the enormous amount of information required to determine the emissions of foreign-produced goods.⁷⁷ The second is the risk that once a system of border tax adjustments is put in place, it will be captured by protectionist interests. Moore (2010) observes that the carbon-intensive sectors that are likely to be at the centre of the issue – steel, chemicals, paper, cement, and aluminium – are intensive users of anti-dumping measures, suggesting that they will be aggressive in their attempts to use border tax adjustments as a means of limiting international competition.

Subsidies

As discussed in Section B.1, the existence of positive effects can provide a legitimate reason for governments to use subsidies to support an economic activity with societal benefits that are not reflected in market prices. In the case of climate change, there are strong reasons to believe that technological change offers the main avenue for reducing future emissions and achieving the eventual stabilization of atmospheric concentrations of greenhouse gas emissions. The Intergovernmental Panel on Climate Change (IPCC) identifies several reasons why R&D subsidies are warranted, particularly in the energy sector (Metz et al., 2007).

The benefits of R&D may not be realized for decades, which is beyond the planning horizons of even the most forward-looking firms. Industry can only appropriate a fraction of the benefits of R&D investments and as a result, firms under-invest in R&D.

Moreover, firms face difficulties in evaluating intangible R&D outputs and regulatory interventions can cap profits in the case of path-breaking research success. Finally, given that the agricultural sector is a major source of emissions, there is also a potential role for subsidies to facilitate the adoption of “climate smart” agricultural technologies.

On the other hand, it is also true that subsidies provide governments with a means of supporting competitively challenged domestic firms and industries. One area where the role of subsidies has gained increased attention is in biofuels. There are no readily available data on the amount of these subsidies at the global level. However, a recent study by Steenblik (2007) using information on five OECD members – Australia, Canada, the European Union, Switzerland and the United States – provides an estimate of biofuel subsidies of about US\$ 11 billion a year. A joint report by several international organizations including the WTO (Food and Agricultural Organization (FAO) et al., 2011) estimates that during the 2007-09 period, biofuels accounted for a significant share of the global use of several crops – 20 per cent for sugar cane, 9 per cent for vegetable oil and coarse grains and 4 per cent for sugar beet.

The political economy of subsidies has been raised in the context of biofuel subsidies, where it is claimed that a primary objective of some countries’ biofuel policy is to increase farmers’ and landowners’ incomes (Rubin et al., 2008). A number of concerns, economic, environmental and social, have also been raised about the wisdom of large biofuel subsidies. Some biofuels emit more greenhouse gases than they save. Any expansion of biofuel production will have indirect effects on greenhouse gas emissions through land use expansion. Subsidies for biofuels have also been implicated in the recent spike in commodity prices which has been particularly detrimental to food-importing developing countries (Mitchell, 2008).

Regulatory measures

As noted in Section B.1, regulations are widely used to deal with environmental problems. The discussion there also suggested that governments may prefer these measures for distributional or competitiveness reasons, uncertainty about the costs and benefits of abatement, and the difficulty of monitoring and enforcement.

In the field of climate change, it is possible to distinguish between technology standards that mandate specific pollution abatement technologies or production methods, and performance standards that mandate specific environmental outcomes per unit of production (Sathaye et al., 2007). An example of a technology standard is a regulation that requires the use of specific CO₂ capture and storage methods on a power plant; an example of a performance standard is one that limits emissions to a certain number of grams

of CO₂ per kilowatt-hour of electricity generated (Sathaye et al., 2007). Beyond these types of regulations, some have also pointed to the prospect of more sanitary and phytosanitary measures being taken by countries given that climate change will alter the impact of pests and diseases (Jackson, 2008). In the face of greater uncertainty about pest invasiveness, countries could become more risk averse and use emergency trade restrictions as a way of managing those uncertainties.

Assuming foreign producers have higher emissions or their products are less energy efficient, requiring foreign producers to comply with more stringent domestic requirements can reduce carbon leakage. Foreign production of the goods, and their sale in the home country can continue, but it will be employing technology or standards that are as environmentally friendly as those in the home country. Since the requirements also raise the trade costs of foreign producers, domestic firms are able to secure some advantage and the overall effect may be a reduction of imports by the home country.

(iv) Conclusions

Nothing speaks to the intertwining of public policy goals and domestic producer interests more than the issue of carbon leakage and competitiveness. The close link between these two issues confronts us with one of the main themes of this report: distinguishing between the pursuits of public policy goals and of domestic producer interests. There is clearly a global interest in reducing carbon leakage and countries can have strong environmental reasons for using trade measures to prevent free-riding. The other side of the coin, however, is that the same trade measure also helps competitively challenged domestic producers so that the risk of regulatory capture cannot be easily dismissed. We may see increasing use of non-tariff measures in the future to deal with carbon leakage and competitiveness concerns as well as disagreements about the underlying motivation behind those measures and their trade effects.

(c) Food safety measures

This section discusses why food safety measures⁷⁸ appear to have become more and more important in recent times and what the challenges are that countries face regarding their impact on international trade. It concludes that more transparency is needed to ensure the pursuit of consumer interests and to prevent protectionist abuse.

(i) Increased importance of food safety measures

The growing interest of consumers worldwide in safety and quality attributes of food has drawn a lot of

attention to the role of food safety and quality measures in international trade, both governmental and private (Henson and Caswell, 1999). On the one hand, governments intervene in food markets as markets alone fail to provide the socially desirable level of quality and safety (Smith, 2009). On the other hand, agri-food enterprises employ private standards as a tool for product differentiation and quality-based competition (Henson and Reardon, 2005). Hence, the widespread incidence of both governmental and private measures in the agri-food sector relates to developments on both the demand and the supply side of the agri-food system, with clear linkages and interdependencies.

Demand-driven developments

Technological, social and economic developments have transformed consumer demand, and recent food safety incidents have amplified this trend. A renewed focus on consumer awareness has resulted in a growing demand for higher levels of regulation and communication, and appears to have shifted food markets from price-based towards quality-based competition.

Growing attention by consumers to quality and safety attributes

Demographic and social trends – such as urbanization and the evolving role of women in the workplace – have modified eating habits and patterns of food demand (Reardon and Barrett, 2000). At the same time, increasing levels of income, technological advances, more sophisticated information about the influence of diet on health and its mass communication have influenced consumer attitudes towards food attributes, increasing their awareness of risks and opportunities related to eating behaviour (Caswell and Mojduszka, 1996; Kalaitzandonakes et al., 2004; Grunert, 2005). This change in focus has led consumers to consider aspects of food that cannot be verified at the time of consumption (Caswell and Mojduszka, 1996). In addition, scientific progress has facilitated a more precise identification of health risks, thus allowing consumers to increase their evaluation standards (Mafra et al., 2007).

Moreover, when assessing food quality, consumers appear increasingly to pay attention to a broader range of product and process characteristics, such as the impact of food production on the environment, worker welfare and global poverty (Henson and Reardon, 2005). These developments, which are increasingly prominent also in developing countries (Reardon et al., 2001), have led to a market for quality and safety characterized by imperfect information and substantial transaction costs in obtaining and using information (Caswell and Mojduszka, 1996). Governments and private sector actors have intervened to correct these inefficiencies, introducing governmental measures

that regulate food products and production processes and developing private standards, respectively.

Food safety scares

A number of high-profile food safety scandals have heightened public and private attention to food attributes even further. The dioxin crisis in the poultry sector in the Netherlands in 2006, the bovine spongiform encephalopathy (BSE) in the beef sector in various European countries over a number of years and the Chinese melamine-adulterated milk contamination in 2008 are prominent examples (Latouche et al., 1998; Marucchi et al., 2011). Considerable media attention towards these crises amplified their effects on consumer attitudes, and this process of “social amplification” has resulted in an important decrease in consumer trust in relation to public and private assurances regarding the safety of food (Latouche et al., 1998).

The subsequent need to restore confidence in public authorities and food producers has led to an increase in transparency in regard to the operation of the supply chain (Böcker and Hanf, 2000; Mazzocchi et al., 2008), and governmental and private food safety measures have proliferated as tools to guarantee such levels of transparency (Henson and Humphrey, 2010). While public actors have tightened existing measures and instituted new measures for emerging and previously unregulated issues, food companies have felt the need to control reputational and commercial risks related to food safety (Henson and Reardon, 2005).

Supply-driven developments

Besides demand-driven changes, developments on the supply side of food markets have contributed to an increase in both governmental and private measures related to food safety and quality. The structure of the supply chain has evolved towards increased fragmentation across multiple enterprises and integration into global markets. This development has been driven by technological changes which have led to a re-organization of farm activities and an increased provision of goods and services by off-farm enterprises (Reardon and Barrett, 2000). The large number of players involved in the supply chain has heightened the need for both coordination among firms and government assurance of quality and safety in relation to food products and production processes. The global reach of today's agri-food supply chains, driven by advances in communication, distribution and transportation systems, has further amplified the challenge to ensure traceability and compatibility among food safety measures in different jurisdictions.

Coordination costs and global supply chains

Fragmented supply chains face coordination and monitoring challenges. Agri-food supply chains may

involve a high number of supplier-buyer relationships across which the quality and safety of the final food product needs to be ensured (Henson and Reardon, 2005). Coordination and monitoring efforts increase transaction costs and are further complicated by different levels of information between buyers and suppliers (Gereffi et al., 2005; Hammoudi et al., 2009). This has led firms to adopt “hands-on” forms of coordination or even to strive for complete vertical integration. Alternatively, coordination costs and information problems at the inter-firm level have been managed at arm’s length via product and production standards (Ponte and Gibbon, 2005; Gereffi et al., 2005). As agri-food chains become global and involve different regulatory environments, the role of these instruments in the coordination of supply chains and the standardization of product requirements among suppliers becomes of greater importance (Henson and Reardon, 2005; Marucheck et al., 2011).

Importance of, and challenges related to, traceability

Allowing for the precise tracking of food products along the supply chain, traceability systems represent important instruments to assure food quality and safety in agri-food supply chains. Their principal aim is to collect the necessary information for the identification and the eventual recall of products that represent a risk to consumers (Meuwissen et al., 2003). The adoption of traceability systems is related to the broader phenomena of increased consumer attention to food safety and quality, technological progress and the global extension of food supply chains. The safety scandals previously referred to have increased the interest of consumers in these instruments (Souza-Monteiro and Caswell, 2004; Dickinson and Bailey, 2002). In order to function adequately, traceability systems must allow for the identification of all partners in the supply chain, and grant complete information transfers. The trend towards an increased internationalization of supply chains has posed considerable challenges to the accomplishment of these requirements, and led to a growing need for regulation and cooperation (Meuwissen et al., 2003).

(ii) Trade impacts of food safety measures and mitigation strategies

Given the important role that food safety measures play on both the supply and demand side of food, these measures are bound to affect international trade in these products.⁷⁹ This part describes some of the principal ways in which food safety measures affect producer strategies and considers mechanisms for mitigating possible negative trade impacts.

Trade impact

Food safety measures can create both challenges and opportunities for producers. Some of the main

challenges relate to the costs associated with diverse requirements. By investing in the capacity to produce products that achieve higher safety requirements, producers may also benefit from accessing higher-value markets. Producers may also invest in developing their own standards as a marketing strategy and as a means of managing product quality along the value-chain.

Compliance costs and loss of economies of scale

Costs of compliance can result in the loss of economies of scale for foreign producers if different requirements apply in different export destinations. These costs will be a function of the exporters’ administrative and technical capacity for managing diverse requirements (Henson and Mitullah, 2004; Mathews et al. 2003; Otsuki et al., 2001). In addition, food safety measures usually include both a specified level for particular substances and systemic requirements associated with record-keeping and conformity assessment. Therefore, when they are considered cumulatively, regardless of whether the level of these food safety measures is the same, if the conformity assessment procedures are different, costs may increase due to duplicative testing requirements.

Increase in value-added

Food safety/quality measures may also embody advanced regulatory “technology” and help increase value-added in the exporting country. Some analysts stress that rising food safety requirements can catalyse trade, creating incentive for firms to invest in order to re-position themselves in competitive global markets (Jaffee and Henson, 2004; Swinnen and Maertens, 2009). Of course, food safety measures impact the competitive position of individual countries and distinct market participants differently depending on their strengths and weaknesses.⁸⁰ High requirements typically are associated with high-value trade, which means producers participating in this type of trade will be able to receive higher returns. In a supportive policy environment, poor producers may benefit directly through contracted participation in the value chain (see, for example, Jaffee et al., 2011).

Private standards and market power

Private sector food safety standards play an important, and increasing, role in determining international trade outcomes, adding an additional layer of complexity to understanding trade in food products.⁸¹ When retailers have buying power, such standards can become *de facto* market entry barriers for certain producers (Henson and Humphrey, 2009; World Trade Organization (WTO), 2005b). This is particularly the case for developing countries which act as “standard-takers” rather than “standard-makers”. Research indicates that in many cases, developing countries are standard-takers because developing their own

standards is more costly than adopting the standards of their major markets (Stephenson, 1997).

Increasingly, private companies or groups of retailers have created their own standards to satisfy consumer demand for particular product characteristics and as a tool to segment markets. For example, the UK supermarket chain Tesco has a standard that all its suppliers of fresh fruits, vegetables and salads must meet (García Martínez and Poole, 2004). Private standards often go beyond food quality and safety specifications and include ethical and environmental considerations as well (Swinnen and Maertens, 2009). The implications for the multilateral trading system in regard to private standards as well as further challenges in regard to multilateral cooperation on food safety measures more generally are discussed in Section E.

Mitigation of negative trade impacts

Several approaches are available to mitigate the possible negative impacts of food safety measures on trade. Countries may seek to harmonize their food safety measures to a particular benchmark. They may also negotiate an agreement to recognize other national food safety systems as achieving the necessary level of food safety. Countries also commit to a common set of rules embedded in the WTO's SPS Agreement that seek to limit the potential use of food safety measures for protectionist purposes.

Harmonization and equivalence

While protectionist incentives may contribute to regulatory diversity in food safety regulations, this diversity persists for a variety of other reasons. Risk perceptions and preferences and the interpretation of scientific evidence may vary among countries. These differences may lead to the adoption of different levels of food safety regulations. Food safety measures, however, are typically more complex than a specification of a particular level for content of risky material. A large proportion of food safety measures are process requirements which define particular approaches for achieving specified levels of food safety. Since the conditions within each country vary, the optimal approach for achieving the same level of safety may also vary. There are various collective approaches for reducing the potential negative trade impacts associated with this diversity.

One approach would be for countries to seek to harmonize food safety measures to a single standard or standards system. Harmonization can take many forms and the impact of harmonization will depend upon what level is chosen as the benchmark. WTO rules in relation to food safety encourage harmonization towards international standards set by the Codex Alimentarius Committee. This intergovernmental body collectively decides on

standards, guidelines and recommendations in the area of food safety and, in principle, should incorporate the preferences of all countries participating in the standard-setting (for more detailed discussion, see Engler et al., 2012; Hooker, 1999; Sykes, 1999).

Another approach for addressing regulatory diversity among countries is for countries to recognize food safety measures of trading partners as equivalent even if these measures differ from their own.⁸² This approach would enable countries to develop food safety systems to fit their specific context, rather than forcing a one-size-fits-all approach to achieving a particular level of safety (Josling et al., 2005). Equivalence is particularly important in the case of process requirements due to their complexity. By contrast, product requirements are typically defined along fewer dimensions and are thus more easily compared. In practice, the determination of whether a system of food safety requirements achieves a reasonable level of safety may be administratively burdensome because it requires an evaluation of the system of risk management interventions, including infrastructure, programme implementation and specific technical requirements.

Other means to prevent trade distortions

As food safety measure can be abused for protectionist purposes,⁸³ countries can commit to a range of disciplines that constrain such behaviour. Some principal obligations contained in the WTO SPS Agreement in this regard are outlined below.

First, the right to implement trade-distorting food safety measures is linked to a scientific justification of the measure, specifically that the measure be based on scientific assessment of food safety risks. Another aspect of the rules emphasizes that the level of risk sought within countries should be consistent in different situations. Of course, as noted above, while food safety measures will include a target level for content of risky material, the measures usually also include other dimensions. Some analysts have questioned whether consistency is a realistic expectation given the complex system of factors that contribute to the development of regulations (Sykes, 2006). Finally, the WTO rules for food safety explicitly state that food safety measures should be “not more trade restrictive than required to achieve their appropriate level of sanitary or phytosanitary protection”. As in the case of recognition of equivalence across countries, this requirement recognizes that there may be alternative approaches that could be taken to reach desired levels of safety.

5. Summary and conclusions

This section has introduced different categories of non-tariff measures and measures affecting trade in

services, analysed their policy rationales and economic effects and elucidated the difficulties involved in identifying possible protectionist abuses. In Section B.1, reasons for government intervention have been reviewed, as have the policies implemented in pursuit of these goals that may affect trade. This has resulted in the findings outlined below.

National welfare-maximizing policies that seek to manipulate the terms of trade or shift profits from foreign to domestic firms are explicitly trade-oriented. Measures affecting foreign producers may also be taken in order to privilege specific industry lobbies for political economy motives. Other policies address public policy concerns, such as environmental protection or consumer health. As such, they are not targeted at distorting trade, but may nevertheless affect trade in order to reach their objective.⁸⁴

A range of instruments are available to pursue these policies. Trade objectives can be pursued using tariffs or openly trade-distorting non-tariff measures, such as quotas, export taxes or subsidies. For many public policy objectives, non-discriminatory NTMs, such as regulatory measures or product taxes, are first-best policies. However, governments can also implement origin-neutral measures in ways that *de facto* discriminate against foreign producers or employ NTMs that are inefficiently reducing trade more than necessary to fulfill a public policy goal.⁸⁵

While a government may declare its intention to pursue a public policy objective, such as consumer protection, it may employ a non-tariff measure in a way that creates an artificial advantage for domestic over foreign producers. Behind-the-border measures of this sort pose a particular challenge to trade cooperation because their effects and motivations are often less clear than border measures. In general, the costs and benefits of regulatory measures are more difficult to evaluate than classical price and quantity instruments,⁸⁶ which is why the remainder of this report puts a particular focus on TBT/SPS measures and domestic regulation in services.

Section B.2 has discussed a number of situations in which governments may be inclined to use certain non-tariff measures rather than more efficient instruments. Under certain conditions, governments may specifically prefer “opaque” measures in terms of both their cause and effect or choose NTMs that increase fixed rather than variable costs. Political motives and institutional constraints can explain the persistence of inefficient NTMs more generally. The recent phenomenon of offshoring, where business relations are characterized by bilateral bargaining rather than market clearing, provides another reason why, also from a national welfare perspective, governments may distort NTMs, including behind-the-border policy instruments such as TBT/SPS measures, in addition to tariffs in order to influence trade. Finally,

Section B.2 has highlighted that governments employ NTMs that are not effectively regulated at the international level and use these to take the place of tariffs or other NTMs that are constrained by trade agreements.

One of the main insights from this discussion has been that neither the declared aim of a policy nor its effect on trade, which may be coincidental in the pursuit of a “legitimate” public policy objective, in and of itself can offer a conclusive answer to the question whether a non-tariff measure is innocuous from a trade perspective or not. A number of factors have been identified in Sections B.1 and B.2 that can be examined in order to assess whether an NTM may be employed for competitiveness reasons despite statements to the contrary or may otherwise unduly influence trade. These include an analysis of the efficiency of the measure in achieving its objective compared with alternative means as well as of its incidence – that is the distribution of costs and benefits among producers and consumers both domestically and abroad. An examination of sector characteristics, such as the degree of organization or extent of bilateral bargaining in international business relations, and the wider political context in terms of institutions, political processes, information problems and the like also informs this assessment. These issues are further elaborated in Section E.4, where challenges faced by the multilateral trading system in relation to NTMs and possible ways forward are discussed.

Section B.3 has briefly presented the specific features of services trade, the types of services measures encountered and the principal reasons why governments intervene in services markets. Despite the peculiarities of services trade, the discussion has revealed the same fundamental difficulty in distinguishing situations when services measures pursue exclusively legitimate objectives from instances in which they also have a trade-related purpose. Section E.2 provides a more detailed account of the progress made and challenges faced in regulating services measures at the international level.

Finally, the case studies contained in Section B.4 have highlighted the prominence of non-tariff measures in a number of current high-profile areas of government activity and the need for a better understanding of the types of NTMs used, their objectives and effects. The recent financial crisis has given rise to a host of new NTMs taken for “emergency” reasons. However, the global extent of the crisis has quickly heightened the need for widespread monitoring of the measures taken in order to forestall temptations to pursue beggar-thy-neighbour policies or to engage in such practices in retaliation for perceived protectionism.

The issue of carbon leakage and competitiveness in the context of climate change policy has given rise to

extensive debates about the use of non-tariff measures in this regard and provides a powerful example of the difficulties involved in distinguishing between the pursuit of legitimate public policy concerns and the ability to serve sector-specific trade interests. The lack of progress in climate change negotiations and the desire by certain countries to forge ahead unilaterally have the potential to lead to an increased use of NTMs and trade rows over their true purpose and impact.

Last but not least, economic, social and technological developments have fuelled the rise of food safety measures as an important tool in supply chain management and consumer protection. Food safety measures offer opportunities and pose challenges to producers, and efforts to mitigate negative impacts have received renewed attention, not least with the creation of the Standards and Trade Development Facility (STDF), an inter-organizational initiative for enhancing developing countries' capacity to meet SPS requirements.

All of these concerns have in common the need for appropriate data, and the challenges faced in improving transparency through notifications, monitoring and other techniques are further discussed in Section E.4. Section C takes stock of the existing information base on non-tariff measures, which for many types of measures is found to be wanting. Wide gaps in the coverage and content of the data make it difficult to gauge the extent to which the use of NTMs in the areas described above (and more generally) has indeed increased over time and whether this has resulted in additional impediments to international trade, as will be further described below.

Endnotes

- 1 Wolfe makes a similar argument about the positive effect of transparency on trade, pointing to the role of the WTO's monitoring mechanism in reducing the incidence of protectionism during the global economic crisis.
- 2 In the paper, political transparency refers to openness about policy objectives and institutional arrangements that clarify the motives of monetary policy-makers. This could include explicit inflation targets, central bank independence and contracts. Economic transparency focuses on the economic information that is used for monetary policy, including economic data, policy models and central bank forecasts. Procedural transparency describes the way monetary policy decisions are taken. This includes the monetary policy strategy and an account of policy deliberations, typically through minutes and voting records. Policy transparency means a prompt announcement and explanation of policy decisions, and an indication of likely future policy actions in the form of a policy inclination. Operational transparency concerns the implementation of monetary policy actions, including a discussion of control errors for the operating instrument and macroeconomic transmission disturbances.
- 3 This is an idea as old as Adam Smith in the *Wealth of Nations*: "As it is the power of exchanging that gives occasion to the division of labour, so the extent of this division must always be limited by the extent of that power, or, in other words, by the extent of the market".
- 4 A labelling requirement may not be a panacea if for example it required a detailed breakdown of the origin of each component part as this information could be difficult and costly to track down.
- 5 Where there is less than perfect information about goods, economists generally distinguish between search, experience and credence goods. Search goods (e.g. clothes) need to be inspected before buying in order to observe their characteristics. Experience goods (e.g. wine) have unknown characteristics, but these attributes are revealed after buying or consuming them. Credence goods have the characteristic that though consumers can observe the utility they derive from the good (or service) *ex post*, they cannot judge whether the type or quality they have received is the *ex ante* needed one. See Dulleck et al. (2011). An example of a credence good (or service) is a doctor's advice about medical treatment. The patient may realize that he or she is getting better from the treatment but does not know if he or she is being over-treated – being prescribed drugs and therapies that are not strictly required or are more costly.
- 6 Bagwell and Staiger recognize that the fact consumers learn about the quality of the goods after purchasing opens the door for the high-quality firm to offer a low introductory price at which it suffers a loss but entice enough consumers to purchase it and learn about its true quality. Thus, there could be circumstances where export subsidies will not be needed to overcome the barrier posed by information asymmetry.
- 7 As Bagwell and Staiger (1989) note, export subsidies in this situation improve the welfare of both the exporting and importing countries and do not have the beggar-thy-neighbour effects usually associated with their use.
- 8 There are only a few examples of environmental taxes in the United States, notably taxes on gasoline, motor fuels, oil spills and chemical feedstocks. See Bovenberg and Goulder (2002).

- 9 The classic discussion of price versus quantity measures under policy uncertainty is found in Weitzman (1974).
- 10 The US-tuna case is a GATT-era dispute between Mexico and the United States concerning the latter's ban on imports of tuna caught using fishing methods that resulted in rates of accidental kill or injury of dolphins exceeding US requirements.
- 11 The US-shrimp case involved a dispute between a number of developing country complainants (India, Malaysia, Pakistan and Thailand) and the United States. It concerned a US prohibition of imports of shrimp and shrimp products from countries that did not use a particular type of net in catching shrimp, a net that would allow endangered turtles that were accidentally caught to escape and avoid drowning.
- 12 The Montreal Protocol banned the trade of ozone-depleting substances and required the phasing out of their production.
- 13 These are specified more formally in, for example, Meade (1952), Kemp (1960) and Corden (1974).
- 14 A natural choice of quota level is the policy-maker's forecast of the long-run level of imports when the domestic industry achieves full maturity. The restrictiveness of this quota declines as the industry's experience accumulates until the quota no longer binds when learning is complete.
- 15 Although Katz and Shapiro (1985) originally applied the term "network externalities" for these effects, Liebowitz and Margolis (1994) disputed whether these were really externalities. In later work by Katz and Shapiro (1994), they switched to the term "network effects" suggested by Liebowitz and Margolis (1994). See also the discussion of network effects/externalities in World Trade Organization (WTO) (2005b).
- 16 This symmetry between import and export taxes was first formally articulated by Lerner (1936).
- 17 The reason for this result is as follows. An export subsidy given by the home country to its export good 1 would lead to a fall in that good's world price and an increase in its price at home. Total demand (foreign plus home consumers) for the country's other export good 2 will increase if the two products are complements abroad and substitutes at home. Under certain conditions, the increased demand for good 2 will lead to a terms-of-trade improvement in that product, which will more than offset the terms-of-trade loss in good 1.
- 18 Under Cournot competition, output decisions are "strategic substitutes". The increase in the output of the home firm induces a reduction in the output of the foreign firm. Strategies are said to be strategic substitutes if the optimal response by one firm to more (less) aggressive play by another firm is to be less (more) aggressive (Bulow et al., 1986).
- 19 Under Bertrand competition, prices are "strategic complements". An increase in the price charged by the home firm induces an increase in the price charged by the foreign firm. Strategies are said to be strategic complements if the optimal response by one firm to more (less) aggressive play by another firm is to be more (less) aggressive (Bulow et al., 1986).
- 20 This is to be distinguished from "product" or demand-enhancing innovation. See Athey and Schmutzler (1995).
- 21 For less resource-strapped developing countries, conditional cash transfer programmes which provide money to poor families contingent on certain behaviour, usually investments in human capital such as sending children to school, have become more widely employed given their apparent success (Fiszbein and Schady, 2009).
- 22 However, see Levy (2003) for a critique of the Grossman-Helpman approach. In his view, the Grossman-Helpman approach posits fully-informed rational actors who divide up a surplus. This would not explain the use of a voluntary export restraint (VER), which is an inefficient means of transferring income to special interests since the country incurs a terms-of-trade loss.
- 23 This is because lobbies also have consumer interests and they benefit from lower protection in sectors other than their own.
- 24 On this last point, one should note that the empirical study by Maggi and Rodríguez-Clare (2000) arrives at the opposite conclusion. They find that the protection level increases with import penetration, both in sectors that are protected with tariffs and in sectors that are protected with quantitative restrictions.
- 25 See the discussion of conformity assessment in the *World Trade Report 2005* (World Trade Organization (WTO), 2005b).
- 26 This assumes that the oligopolists are Cournot competitors. This means that each oligopolist uses the level of its output, rather than say the price it charges for its good, as the instrument to compete against its rivals. If it wants to be more aggressive towards its rivals, it expands the volume of its production. If it wants to be more passive, it reduces the level of its output or capacity.
- 27 It is assumed that cartel members follow a "grim trigger" strategy. They cooperate with other cartel members so long as everyone else is cooperating. They cease to cooperate and pursue that path forever at the first instance of a member cheating.
- 28 Alternatively, one can assume that the measure applies to both domestically produced and foreign-made goods, but compliance with the regulation raises the costs of foreign producers more than domestic producers. Abel-Koch (2010) and Rebeyrol and Vauday (2009) discuss the case where compliance costs are identical for domestic and foreign firms but where firms have different productivities.
- 29 An important parameter that affects these trade adjustments is the degree of substitutability of the products, or more precisely the elasticity of substitution (Chaney, 2008). The degree of product substitutability has opposite effects on each margin. A higher elasticity makes the intensive margin more sensitive to changes in trade costs, while it makes the extensive margin less sensitive. Chaney is able to show that if the productivity of firms follows a Pareto distribution, adjustment along the extensive margin will dominate.
- 30 Here, it is generally assumed that governments, when enacting policy, only take into account national, not global welfare. Or, in the case of political economy, governments only consider the interests of domestic, not foreign firms and, hence, act differently than they would if all producers were located domestically. See, for instance, Fischer and Serra (2000) or Marette and Beghin (2010) for a formalization of this approach. These papers ask more generally when protectionism occurs, while the focus of this sub-section is specifically the choice of policy instruments, i.e. on the conditions under which specific types of NTMs are chosen rather than other policy options.
- 31 There is no narrowly defined literature in economics on this subject and some of the studies reviewed here belong rather to a political science literature. The list of explanations provided here regarding governments' constraints in the choice of policy instruments, while important, is not necessarily exhaustive.

- 32 In examining the degree of “welfare-mindedness” of governments across a large sample of countries, Gawande et al. (2005) show empirically that the more informed citizens are, the greater is governments’ concern with aggregate welfare rather than special interests in shaping trade policy.
- 33 As noted in the previous sub-section, in our considerations of political economy, we mainly presume producers to be organized and consumers to be unorganized. For many policy issues, this has found to be a reasonable assumption. However, where consumer organizations exist, they may have considerable political influence as well, for example in the area of food safety (Swinnen and Vandemoortele, 2011). Gulati and Roy (2007) show that political links are created between different policy instruments when governments need to take into account both producer and consumer interest groups. Such links may enhance or cushion the trade impact of relevant policies. In turn, such linkages also imply that when trade agreements deal with behind-the-border issues that have traditionally been seen as being of purely domestic concern, special interest groups that previously have not engaged in trade policy may begin to take an active interest in this domain. Section E deals with international cooperation on NTMs and will touch further on these issues and the implications that they may give rise to, for instance in regard to transparency.
- 34 A similar argument for the use of public policy measures as disguised protectionist devices arises when several interest groups lobby for protection but the government cannot provide protection to everyone through tariffs (because of some external constraint, e.g. in the form of an international trade agreement limiting the overall level of tariff protection). In this case, the government could protect one industry with an NTM, e.g. a regulatory measure, assuming that interested parties (competitors, consumers) are unable to verify its real protectionist impact. A government may also prefer a comparatively opaque NTM if it has specific ties with certain interest groups (e.g. of an ethnic or cultural nature), but seeks to hide its discriminatory treatment among lobbies (Robinson and Torvik, 2005). In a seminal paper, Laffont and Tirole (1991) show that interest groups themselves may have an interest in inefficient regulations if they are privy to relevant information about policies that is not available to policy-makers and this situation may afford them additional political influence.
- 35 The authors highlight that for questions of public policy it is rational for an individual to remain ignorant, when the expected benefits are small relative to the costs of acquiring the necessary information.
- 36 The author explains quite succinctly that, all else being equal, a “bad” politician would prefer to provide a direct subsidy to producers, “since implementing the product standard is distortionary in the low-risk state [i.e. not optimal on welfare grounds] and even bad incumbents care about welfare” (Sturm 2006: 575). However, the re-election perspective can dominate this effect, i.e. “bad” incumbents who attach low importance to social welfare and for whom re-election is sufficiently beneficial prefer to distort the environmental policy in order to make an indirect transfer to local producers rather than to provide a subsidy that would signal their “bad” political behaviour to voters and entail electoral defeat with certainty.
- 37 See also Yu (2000) who develops a parsimonious model in which changes in the degree of transparency of an NTM, in this case a voluntary export restraint (VER), compared to a tariff and the relative market distortions that these instruments entail have an impact on governments in their choice of substituting an NTM for a tariff.
- 38 This is different from a strand in the trade literature that has explained the existence of trade policies more generally when the identity of winners and losers from trade opening is uncertain. See, for example, Feenstra and Lewis (1991).
- 39 In economic terms, this means that the costs of an excessive overpayment must be traded off against the “deadweight” loss associated with a distortionary policy.
- 40 A similar result holds if legislators are motivated by policy rather than lobbying contributions, so long as the legislator cares about the policies chosen after leaving office (Martimort, 2001).
- 41 The relationship between policies in the national interest and policies oriented towards individual constituencies can be complex. Some national policies, such as a nation-wide education programme, can have long-lasting impacts. Battaglini and Coate (2007) warn that once such a policy is in place, future legislators can leverage the gains from the investment to divert resources towards less efficient measures that favour their constituency. Anticipating the distortionary effects of a surplus of public goods, the authors note that in some cases legislators may do better by partially limiting investment in public goods to discourage inefficient NTMs.
- 42 Of course, conformity assessment for individual shipments still entails some form of variable cost related to the measure.
- 43 See also Schmitt and Yu (2001) and Jorgensen and Schroder (2008) for a perspective on the welfare effects of tariffs in the presence of fixed exporting costs.
- 44 To be more precise, unlike in Rebeyrol and Vauday (2009), Abel-Koch (2010) shows that even if foreign firms are more productive on average (and, consequently, import penetration is high), the introduction of a behind-the-border NTM may still shift profits towards domestic firms if in the latter the Pareto distribution of firm productivities is less skewed than abroad. In such case, the ratio of highly efficient firms to rather inefficient firms and hence the ratio of winners to losers from behind-the-border measures is higher for domestic than foreign firms, and, overall, profits are shifted from abroad towards the country introducing the measure. This proposition may be seen as a possible contradiction to the prediction by Grossman and Helpman (1994) that the level of protection varies inversely with import penetration. However, as will be discussed further below, it is still generally true, albeit for different reasons, that the level of e.g. a regulatory measure will be higher the fewer foreign firms are active in the domestic market, as in such situations competition among domestic firms and the potential for domestic profit-shifting are relatively more important.
- 45 Bombardini (2008) shows that when the channeling of political contributions entails fixed costs, the largest firms in a sector will form an interest group. The author goes on to confirm empirically that sectors with a higher share of large firms exhibit a higher level of political activity.
- 46 For an empirical confirmation see Yi (2003).
- 47 See also Fischer and Serra (2000), for example, for the application of an environmental measure in an international duopoly situation where the regulation is set inefficiently high in order to shift rents from the foreign to the domestic producer and impose part of the costs of reducing the externality on the foreign producer. The authors only show that environmental measures can be used as a protectionist device, they do not seek to explain why the government would use an instrument that applies to domestic and

- foreign producers alike (but imposes a higher cost on the latter who are assumed to produce for several markets according to different requirements) rather than trade taxes.
- 48 See, for instance, Antràs (2011) for a recent overview of this literature.
- 49 Unlike Antràs and Staiger (2008), Staiger (2012) obtains "realistic" policy predictions, i.e. policies of increased protection from imports via NTMs, also in a model without political economy considerations. In the former paper, the basic model predicts a subsidization of imports of intermediates by the home government and a taxation of intermediates by the government in the exporting country. While this situation is not unrealistic per se, it may be more relevant in regard to trade in natural resources and other raw materials, where escalating protection (and, hence, a higher effective rate of protection for final products) as well as counteracting export policies have been observed, rather than in regard to trade in manufactured inputs. See also World Trade Organization (WTO) (2010).
- 50 In other words, prices faced by consumers will increase less for a given reduction in quantity equal to the increase in quantity in response to the marginal decrease in the import tariff, as part of the tax incidence falls on producers.
- 51 Anderson and Schmitt (2003) also argue that when competition within an industry is lower, tariff liberalization is lower, and the endogenous response of imposing NTMs, such as quotas and anti-dumping duties, is generally more modest.
- 52 This applies if a "large" country reduces the requirements applied to domestically-produced goods.
- 53 Defined as the probability of a country filing an AD petition.
- 54 The data do not distinguish between tariff liberalization that was unilateral or driven by an international agreement – multilateral or regional.
- 55 Applied rather than bound tariffs are used in the analysis because in the presence of binding overhang, a reduction in the bound tariff may not have any effect on the applied tariff, therefore it would not create any incentive for policy substitution.
- 56 Details of the estimation of *ad valorem* equivalent of NTMs can be found in Section D.1.
- 57 Details about the construction of frequency index and coverage ratio can be found in Section C (Box C.1).
- 58 In a narrow connotation, the term "regulation" may designate the promulgation of a binding set of rules (Baldwin et al., 2012). In a broader sense, it can be used to define all state actions designed to influence economic or social behaviour, referring both to legislative acts and fiscal measures. In the terminology of the GATS, the corresponding notion is that of "measures", as in the Agreement "regulation" refers to a specific type of legislative act (see, for instance, GATS Article XXVIII).
- 59 Lennon (2009), for instance, argues that "trade in goods and in other commercial services reinforce each other. Bilateral trade in goods explains bilateral trade in services: the resulting estimated elasticity is close to 1. Reciprocally, bilateral trade in services positively affects bilateral trade in goods: a 10% increase in trade in services raises traded goods by 4.6%".
- 60 Two- or multi-sided platforms (i.e. platforms that serve two or more distinct groups of customers who value each other's participation, such as media platforms that sell advertising to one group of customers and content to another) or clusters of horizontally complementary or vertically integrated services (e.g. telecommunications, audio-visual and recreational services, or vertically integrated retailers providing wholesale, warehousing and logistics services) are examples of some of the interrelations between different service sectors.
- 61 The United States is one of the few countries that provide information on intra-firm trade.
- 62 The role of services in international production may be significantly underestimated in trade data, because services are to a much larger extent than goods traded indirectly, embodied in goods and other services. Thus, it is estimated that local manufacturing value added embodied in exports accounts for less than 50 per cent of the gross value of manufacturing exports, while local services value added account for 150 per cent of gross value of services exports (Johnson and Noguera, 2012). The authors calculated trade in value using the GTAP 7.1. database for 94 countries and 57 sectors. A share higher than one is possible when direct exports of services is low, but local services are embodied in manufactured exports.
- 63 The manipulation of the terms of trade to increase national welfare is not considered a relevant justification in the case of services trade, essentially because of the oft-associated factor movement (Francois and Hoekman, 2010; Marchetti and Mavroidis, 2011).
- 64 The shift away from state ownership and responsibility for the provision of a service to private ownership and private provision with enhanced state regulation has been described as the rise of the "regulatory state" (Majone, 1994).
- 65 For a discussion of the applicability of traditional theoretical models to services trade see, for example, World Trade Organization (WTO) (2008). For alternative views, see Whalley and Chia (1997), for instance.
- 66 For instance, measures that raise the cost of foreign firms when they sell in the domestic market are more trade restrictive in the presence of incumbent domestic monopoly or oligopoly than under perfect competition (see Deardorff and Stern, 2008 and Helpman and Krugman, 1989). Francois and Wooton (2001) show that, in the presence of an imperfectly competitive domestic industry, a foreign competitor might choose whether to join the home cartel or compete with it depending on the extent of restrictions to cross-border trade.
- 67 Tariff-like instruments could be applicable in certain sectors for given modes. One might conceive, for instance, of a tax per passenger or per volume of cargo in cross-border transport services, given that a physical, visible entity is associated with the service being supplied. Alternatively, entry, output and profit taxes could be applicable to locally established foreign firms (see Copeland and Mattoo, 2008).
- 68 However, Laffont (1999) shows that, in the presence of weak democratic institutions, stimulating competition might not always be welfare enhancing.
- 69 The Global Trade Alert, a similar private initiative that provides information on state measures taken during the recent economic downturn, was established in 2009.
- 70 See Corfee-Morlot and Hohne (2003) for example.
- 71 These emission reduction targets, which are conditional on others meeting theirs, can be found in the UNFCCC website: <http://unfccc.int>.

- 72 Under Article 3 of the Kyoto Protocol, countries listed under Annex I of the United Nations Framework Convention on Climate Change were to reduce their overall emissions of greenhouse gases by at least 5 per cent below 1990 levels in the commitment period 2008 to 2012.
- 73 See Copeland and Taylor (1994) for a discussion of how differences in the stringency of environmental regulations between high-income and low-income countries leads the former to specialize in clean industries and the latter to specialize in polluting industries. Furthermore, they establish that the resulting increase in pollution levels in low-income countries more than offsets the decline in high-income countries.
- 74 To get a sense of the diversity of the indicators used, we examined a random set of studies. Demailly and Quirion (2006) use changes in profits and output as indicators of the change in competitiveness; Zhang and Baranzini (2004) use the increase in cost of production; Reinaud (2008) uses profits and market share; the Stern Review (Stern, 2007) uses the change in producer cost and the pass through to consumer prices.
- 75 Markusen (1976) derives similar results in a model of trade with transboundary pollution.
- 76 There is an interesting paper by Lockwood and Whalley (2008) which relates the current debate on competitiveness and border tax adjustments to a 1960s debate on the Value Added Tax (VAT) and border tax adjustments in the EU. As they make clear, the academic literature of the time showed that a change between origin and destination basis in the VAT would be neutral and hence the use of a border tax adjustment in the EU to accompany the VAT offered no trade advantage to Europe. However, that argument rests on the neutrality of the VAT – relative prices in the EU are left unchanged by the VAT. This will not be the case with carbon taxes since the intent of the mitigation measures is to increase the relative price of carbon-intensive goods to reflect their social cost.
- 77 See Mattoo et al. (2009), though, for how this may be simplified by assuming foreign goods have the same carbon footprint as domestic goods. See Ismer and Neuhoﬀ (2007) for a proposal on how to simplify and make WTO-consistent a border adjustment scheme involving purchases of emission permits.
- 78 For the sake of brevity, the discussion here principally refers to food safety measures, but also mentions relevant aspects of measures relating to quality and broader attributes, such as environmental implications of food production. Swinnen and Vandemoortele (2009) emphasize the extent to which the nature of such measures affects their politically optimal level and the likelihood of trade conflicts, pointing out important differences in this regard. This discussion is beyond the scope of the present sub-section.
- 79 Swinnen and Vandemoortele (2011) build a model to illustrate that food safety measures (almost) always affect trade and, in a political economy context, derive the conditions under which such measures act as a catalyst or barrier to international trade. As noted in Section B.1, the authors also show that a possible negative effect on trade flows does not automatically relate to producer protectionism.
- 80 Mangelsdorf et al. (2012), for instance, find a positive impact of voluntary standards and mandatory requirements on Chinese food and agricultural exports, with the benefits outweighing increased compliance costs.
- 81 For an extensive literature review on private standards, see International Trade Centre (ITC) at www.standardsmap.org, last visited on 9 March 2012, as well as Organisation for Economic Co-operation and Development (OECD) (2006) and related publications.
- 82 A recent example is the agreement on organic food products signed between the European Union and United States coming into effect in June 2012. Agence France-Presse (AFP) reports that before the deal, companies had to conform to two different sets of requirements on both sides of the Atlantic.
- 83 The literature on this subject is rather limited. Foletti (2011) examines the variation in maximum residue limits (MRLs) for various pesticides and products in a range of countries. Analysing the relative contribution of “consumer protection” (at the pesticide level) and “producer protection” (at the product level), she finds that while health motives explain a significant amount of the variation in MRLs, protectionist motives can explain up to one third of the variation. As far as MRL levels are concerned, she finds that higher levels of toxicity result in stricter regulation, as was to be expected. However, whether a pesticide is produced domestically also plays a role, resulting in more lenient regulatory thresholds.
- 84 In Section E.1 the incentive for countries to cooperate is established in order to avoid beggar-thy-neighbour policies or provide a credible commitment device that helps to contain pressure from domestic interest groups. But countries may also cooperate on public policy objectives in order to pursue the most efficient policy not only from a national, but global welfare perspective, or if they share a common public policy goal.
- 85 Although, at face value, the requirements of a measure may be the same for domestic and foreign producers, certain aspects in its application may be inherently more difficult to fulfill by foreign than by domestic manufacturers. For conceptual work on this issue, see Swinnen and Vandemoortele (2009; 2011). A well-known example is the obligation for imports to be tested for their conformity with technical requirements in specific laboratories entailing higher access costs for foreigners than for domestic producers. Another example relates to product taxes, where thresholds are set such that competing foreign products fall in the higher tax bracket.
- 86 Cost-benefit analysis was briefly introduced in Box B.2. For the development of a cost-benefit framework to assess regulatory measures and its application to TBT/SPS, see Van Tongeren et al. (2009; 2010).

C. An inventory of non-tariff measures and services measures

This section reviews available sources of information on non-tariff measures (NTMs) and services measures, evaluating their relative strengths and weaknesses. It uses available information to establish a number of “stylized facts” regarding the incidence of NTMs and services measures in general. It looks in particular at technical barriers to trade, sanitary and phytosanitary measures and domestic regulation in services.

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Some key facts and findings

- Progress is being made on improving the quality and availability of data on non-tariff measures and services measures, but much remains to be done.
- Available data do not show any clear increasing trend in the overall use of non-tariff measures in the last decade.
- Technical barriers to trade and sanitary and phytosanitary measures appear to have become prominent, according to official WTO information. This is confirmed by survey data from both developing and developed economies.
- Procedural obstacles are a particular source of concern for exporters from developing countries.
- Although there is some evidence that measures restricting trade in services have decreased over time in developed economies, a serious limitation of available data on applied regimes in the services area makes it difficult to distinguish between market access, national treatment and domestic regulation.

This section surveys available sources of information on non-tariff measures (NTMs) and services measures, evaluates their relative strengths and weaknesses, summarizes the content of the principal databases, and uses this information to establish a number of “stylized facts” about these types of measures. This last task turned out to be surprisingly difficult due to significant gaps in data and to numerous shortcomings in the data that do exist. Despite these limitations, the following discussion attempts to capture many key features of the current NTM landscape and to document a number of trends in their use over time. As far as services measures are concerned, the data limitations appear to be even more severe than in the case of NTMs. In particular, the current data on services measures do not allow clear distinctions to be drawn between market access, national treatment (i.e. the principle of giving others the same treatment as one’s own nationals) and domestic regulation issues.

The scarcity of data on non-tariff measures and services measures stems in large part from the nature of these measures, which find their ultimate expression in complex legal documents rather than in easily quantifiable tariff schedules. The universe of NTMs encompasses all measures that affect trade other than tariffs, but since most regulatory action undertaken by governments can at least potentially influence trade, the set of possible NTMs is huge and its borders indistinct. Similar considerations apply to services measures. On the goods side, this section examines the available evidence, with a particular attention to technical barriers to trade (TBT) and sanitary and phytosanitary (SPS) measures (covering food safety and animal and plant health). Traditional quantitative and price-based measures are also discussed, but the fact that TBT/SPS measures are among the most frequently encountered NTMs and raise some of the most difficult challenges from the WTO’s perspective justifies the additional attention paid to these kinds of measures. On the services side, the section takes stock of all measures affecting trade in services, to the extent possible, before focusing on domestic regulation.

Statistics on non-tariff measures and services measures are collected by many different institutions for a variety of purposes. As a result, data are often presented in formats that are not amenable to quantitative analysis, with significant gaps in coverage for particular countries and time periods. When reliable information is available, it may still provide no clue as to how strictly measures are applied, or whether they are applied in a discriminatory manner. Most datasets simply present counts of the number of measures in effect at a particular place and time, but these counts have no natural economic interpretation and say nothing about the restrictiveness of individual measures. For these reasons and others, the available data on NTMs and services measures can only be characterized as sparse and incomplete.

The remainder of the section is organized as follows. Section C.1 reviews the main sources of statistical information on non-tariff measures and services measures, paying particular attention to areas where the data are deficient. Section C.2 extracts a number of stylized facts on NTMs in goods from the principal databases. Section C.3 provides a similar account of stylized facts about services measures. Section C.4 contains concluding remarks.

1. Sources of information on NTMs and services measures

This sub-section presents the main sources of information on non-tariff measures and assesses the coverage and quality of the data they provide. Both internal WTO sources and external non-WTO sources are examined. The following overview highlights the diversity of the sources and of the modes in which the data are collected, distinguishing between notifications, monitoring, specific trade concerns, official data collection or business surveys. A distinction is made between information on NTMs and information on impediments to trade related to NTMs. It also shows that despite this diversity, the data are patchy at best. Each data source sheds light on a small part of the universe. The light it sheds depends on the specific purpose for which the data have been collected as well as on how they have been collected, i.e. whether a measure is simply reported/notified or whether there is a complaint relating to the measure. In any case, considerable caution is warranted in interpreting the available evidence.

(a) WTO internal sources of information

One important source of information on WTO members’ trade policies are their schedules of concessions/commitments. These schedules, however, provide useful information on the policies that members have committed to apply rather than on the policies they actually apply. WTO agreements also include multiple provisions aimed at improving the transparency of policy measures affecting trade. These provisions can be grouped into the following four categories: (a) publication requirements; (b) notification requirements; (c) the Trade Policy Review Mechanism and the monitoring reports; (d) the possibility of raising specific trade concerns in the SPS and TBT committees and in the dispute settlement mechanism (DSM).

(i) *Schedules of concessions/commitments*

The schedules of concessions for goods mostly contain information on members’ tariff commitments but they also cover their commitments regarding the use of a number of non-tariff measures that affect trade in agricultural products as well as their so-called “non-tariff concessions”. The agricultural NTM commitments

include tariff quotas (whereby quantities inside a quota are charged lower import duty rates than those outside) as well as commitments limiting subsidization in agriculture (total Aggregate Measurement of Support (AMS) commitment for domestic support, and budgetary outlays and quantity reduction commitments for export subsidies). As for the non-tariff concessions (Part III), they were either added as part of the Uruguay Round negotiations (but only by a few members) or after the Uruguay Round as part of a country's WTO accession process.¹ Both tariff and non-tariff commitments are also available electronically in the Consolidated Tariff Schedules database. Note that the commitments as compiled in the database are not easily comparable across products and members.²

The schedules of commitments for services set out market access and national treatment commitments. For each service on which a commitment is made, the schedule indicates, under each of the four modes of supply, any limitations on market access or national treatment which the member is allowed to maintain. Limitations not recorded in the schedules in this way are illegal. The schedules thus combine a "positive list" of covered services with a "negative list" of limitations. They guarantee a minimum standard of access; members are always free to grant more favourable levels of market access and national treatment than are specified in their schedules, on a most-favoured nation (MFN) or equal treatment basis, and many do so (see Section D.3).

(ii) Publication requirements and enquiry points

Article X.1 of the General Agreement on Tariffs and Trade (GATT) requires the prompt publication of all trade regulations "in such a manner as to enable governments and traders to become acquainted with them". Several other WTO agreements contain more specific publication requirements. In the TBT Agreement, for instance, Article 2.9.1 requires the publication of a notice when the government envisages introducing a technical regulation which is not based on international standards and may have a significant effect on trade. Similarly, Article 2.11 requires the publication of all technical regulations which have been adopted. Identical provisions also apply to conformity assessment procedures. Besides those publication requirements, the TBT Agreement also includes provisions requiring the establishment of enquiry points able to answer enquiries and provide relevant documents regarding technical regulations, standards and conformity assessment procedures.

The purpose of publication requirements and enquiry points is to contribute to transparency by informing other members in general, and producers in exporting members in particular (see Article X as well as, for instance, Articles 1, 2 and 3 of Annex B of the SPS Agreement). Publication requirements and notifications

(see below) tend to complement each other. The SPS and TBT agreements require the notification of draft regulations to the WTO Secretariat and the publication of the adopted regulations. An important difference between notification and publication requirements is that the former is centralized in the WTO Secretariat while the latter merely involves making information publicly available. Another difference is that while notifications must be transmitted to the WTO in one of the three official languages (English, French or Spanish), publications are in the national language.

(iii) Notifications

The WTO framework contains more than 200 different legal notification requirements, the large majority of which relate to non-tariff measures. Notification requirements under the WTO are highly diverse.³ First, while a vast majority of requirements oblige members to provide information on their own policies, some are "reverse" notifications, which allow members to identify measures imposed by other members. Secondly, notifications differ from each other with regard to how frequently they are required. Most of those covering laws and regulations are one-off requirements, with a separate obligation to notify any changes thereafter. The notifications that provide information on the measures themselves typically take two different forms: they are either ad hoc or (semi-) annual. Thirdly, about half of the notification requirements cover NTMs that typically apply to specific products. In those cases, notification templates generally require members to indicate which products are covered. The other half relates to measures (e.g. laws and regulations) that affect, or could potentially affect, all products (e.g. pre-shipment inspection or customs valuation).

A comparison of the list of notifications with the 2010 version of the International Classification of Non-tariff Measures suggests that notifications cover most of the categories (see Table C.2). The international classification comprises 16 broad categories of measures, of which only three do not seem to be covered at all by WTO notification requirements. Those are finance measures, distribution restrictions and restrictions on post-sales services. All the other categories are at least partly covered (i.e. a number of sub-categories are covered while others are not).

Where notification requirements broadly match NTM categories, however, they do not necessarily cover the measures that could be classified therein. In the case of sanitary and phytosanitary measures, for example, Article 7 and Annex B of the SPS Agreement require governments to notify new SPS regulations which are not based on international standards and have a significant effect on the trade of other members, and to notify those at an early stage, i.e. when amendments can still be introduced. Measures that were in place before the entry into force of the SPS Agreement need not be notified, nor is there an obligation to notify the final measures

when they enter into force. This means that some of the measures in place were not notified and that some of those notified may have been amended before being implemented or even not implemented at all.

Notifications provide an incomplete and sometimes misleading account of the incidence of non-tariff measures.⁴ First, WTO members do not necessarily comply with their notification requirements. While the level of compliance is not easy to measure, a simple count of notifications for selected requirements suggests that at least in some areas, it is relatively low. As discussed in more detail in Section E.4, difficulties faced by members in making their notifications may be part of the reason for the low compliance, but the main explanation is certainly that governments have no incentive to notify, or, worse, may have an incentive not to notify. Secondly, notifications serve various purposes (Bacchetta et al., 2012). Some of them clearly do not aim at providing an exhaustive inventory of all the measures in the area they cover. In the SPS and TBT agreements, for example, notifications serve to allow other members to participate in the formation of new regulations. This explains why there is no requirement to notify measures in place before 1995 (when the agreements came into effect) or final measures. Thirdly, the “quality” of the information provided varies significantly among notifications.⁵ Again, the quality criteria may be debatable, but in many cases, notifications fail to provide precise information on important dimensions of the measures, such as product coverage or the time period during which the measure remains in place.

Only a sub-set of the information collected through notifications is stored in searchable databases.⁶ The WTO Secretariat has developed information management systems to facilitate access to all the information on SPS and TBT measures provided by members through the various existing transparency

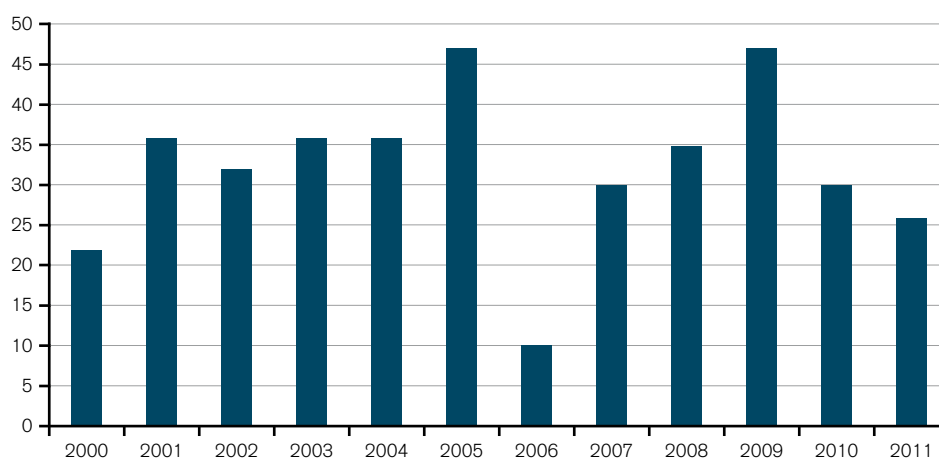
mechanisms. The TBT Information Management System and the SPS Information Management System are “one-stop” systems that allow users to access information on TBT or SPS measures that member governments have notified to the WTO as specific trade concerns raised in the SPS or TBT Committee or through member governments’ enquiry points. The two information management systems are not exactly NTM databases. They are document databases which make it possible to search relevant documents by code, by notifying member, by date, by product or by keyword.

Access to all information from notifications will be substantially improved with the new Integrated Trade Intelligence Portal (I-TIP) which is currently being developed by the WTO Secretariat to provide unified access to all information on trade and trade policy measures available at the WTO.

In services, the transparency-related notification obligation is contained in Article III:3 of the General Agreement on Trade in Services (GATS). It requires WTO members to notify measures that “significantly affect trade” in services covered by their specific commitments. As of end-2011, just over 400 notifications in total had been received.⁷ Figure C.1 shows the number of notifications received per year since 2000.

Considering the high number of sectors with commitments by the 153 WTO members as of end-2011 (on average, developing countries have commitments in more than 50 sectors and developed countries nearly 110 sectors), it seems apparent that the number of notifications received in any given year cannot account for the entire set of measures that should have been notified by members. One difficulty for members regarding the GATS is that the scope of measures to be notified is not necessarily clear, as the GATS provides no further guidance on the

Figure C.1: GATS Article III:3 notifications received, 2000-2011
(number of notifications)



Source: WTO Secretariat.

interpretation of the term “significantly affecting” trade in services. However, as already mentioned, low compliance with the notification requirements is mostly an incentive issue. In committed sectors, members would have no incentive to “incriminate” themselves by notifying measures that somehow violated their commitments. They might also have an interest in being non-transparent about measures that “significantly” liberalized access to committed sectors, as they might be faced with requests to bind any such, not necessarily known, liberalization.

(iv) Trade policy reviews and monitoring reports

Trade policy reviews

The trade policies and practices of all WTO members are subject to periodic review: every two years for the four countries with the largest share of world trade, every four years for the next 16 countries and every six years for the others. The review is carried out by the WTO's Trade Policy Review Body (TPRB) on the basis of two reports: one by the member under review and another by the WTO Secretariat on its own responsibility. In addition to the two reports, the review process includes a questions and answers mechanism. Two months before the review meeting, the reports are circulated among all members who have one month to submit written questions to the member under review. The latter must respond in writing before the meeting.

The report by the WTO Secretariat reviews a broad range of non-tariff measures and is typically in five parts:⁸ economic environment, trade and investment regimes, trade policies and practices by measure, trade policies by sector and Aid for Trade. The chapter on trade policies and practices by measure distinguishes between measures directly affecting imports and those directly affecting exports or those affecting production and trade. Table C.1 lists the measures examined under each of the three headings in the 2011 Trade Policy Review for Cambodia, which has been used for illustrative purposes. Policies affecting trade in services are examined sector by sector.

To prepare its report, the WTO Secretariat uses various sources of information. The starting point is usually the previous report, which can be updated using information from notifications. The Secretariat also sends a questionnaire to the government of the member under review. This questionnaire, which addresses all areas covered in the report, follows a general template but is often customized. To complement the information collected through these institutional channels, other public sources of information are used to identify issues worthy of investigation. Despite considerable efforts, trade policy reviews (TPRs) do not and cannot provide exhaustive coverage of all non-tariff measures in all areas. For example, as already suggested in World Trade Organization (WTO) (2006), information on subsidies in

TPRs is highly variable. Similarly, only a sub-set of services sectors is covered and, in the best possible case, selected domestic regulation is examined.

While the information on tariffs and trade used for the reports feeds into the WTO's Integrated Database and is thus accessible electronically, information on non-tariff measures and on measures affecting trade in services is not stored systematically in electronic format and thus is neither easily comparable across WTO members, nor readily usable for quantitative analysis. Similarly, the questions asked and answers received as part of the review process are published as an annex to the minutes of the TPRB meeting but they are not systematically coded and stored in a database. This may change with the new Integrated Trade Intelligence Portal (I-TIP) which will provide access to all information from TPRs. Efforts will be made to codify this information and thereby facilitate quantitative analysis.

Monitoring reports

The WTO publishes two types of monitoring reports. The first type is published twice a year by the WTO Secretariat for the Trade Policy Review Body.⁹ The reports cover trade and trade-related developments in goods and services of all WTO members as well as observers. They monitor changes in both tariffs and

Table C.1: Measures covered by trade policy reviews

Measures directly affecting imports
(i) Customs procedures
(ii) Tariffs and other taxes and charges affecting imports
(iii) Customs valuation
(iv) Pre-shipment inspection
(v) Rules of origin
(vi) Import prohibitions, quotas, and licensing
(vii) Anti-dumping, countervailing duties, safeguard regimes
(viii) Government procurement
(ix) State trading enterprises
(x) Other measures
Measures directly affecting exports
(i) Procedures
(ii) Export taxes
(iii) Export restrictions
(iv) Export subsidies
(v) Export promotion
(vi) Special economic zones
Measures affecting production and trade
(i) Regulatory framework
(ii) Technical barriers to trade
(iii) Sanitary and phytosanitary measures
(iv) Trade-related intellectual property rights

Source: World Trade Organization (WTO) (2011a)

non-tariff measures as well as in a broad range of measures affecting trade in services. The second type of report is published by the WTO Secretariat together with the secretariats of the OECD and UNCTAD following a request by the G20 to monitor trade and investment measures.¹⁰ These reports, which only cover G20 countries, are also issued twice a year.

The sources of information used for the two types of reports are similar. Both reports mostly use information collected through a request for information sent to WTO members, informal reverse notifications and the press. This information is then submitted to the respective members for verification. The data are made available in public reports and stored in spreadsheets, but not in a database. Like all the other information on trade and trade policy collected by the WTO, however, it will be made available through the new Integrated Trade Intelligence Portal (I-TIP) portal.

WTO members have recognized the usefulness of the trade monitoring exercise. There is broad consensus for its continuation and strengthening as well as for the related briefings by the Director-General in international fora such as the G20.¹¹

(v) *Specific trade concerns and disputes*

Specific trade concerns

WTO members have used both the TBT and the SPS committees as fora to discuss issues related to specific measures taken by other members. These are referred to as “specific trade concerns” and relate variously to proposed measures notified to the TBT or SPS committees in accordance with the notification requirements in the relevant agreement, or to measures currently in force. Committee meetings, or informal discussions between members held on the margins of such meetings, afford members the opportunity to review trade concerns in a bilateral or multilateral setting and to seek further clarification.

Specific trade concerns raised by members are a source of potentially interesting information on the effects of non-tariff measures. Specific trade concerns point out particular obstacles faced by exporters from the country raising the concern in a given export market. The information they provide on the effects of NTMs is thus similar to that provided by business surveys. The main difference is that specific trade concerns are channelled through governments. Exporters facing an obstacle may complain to the government, which may or may not raise the issue at the WTO. This means that specific trade concerns may provide a distorted picture of the trade-restrictive or trade-distortive effects of TBT and SPS measures. A number of concerns may never be raised.¹² Moreover, there are no reasons to believe that the ones that get raised are statistically representative of all the TBT/SPS related trade distortions faced by members.

As already mentioned, the TBT Information Management System and the SPS Information Management System allow users to track, and perform searches on, specific trade concerns raised in the TBT or SPS committees but they are not suitable for quantitative analysis. The WTO Secretariat has thus coded all the relevant information on specific trade concerns and created two databases: one on TBT measures and one on SPS measures. The TBT Specific Trade Concerns (STC) Database provides information on the 317 concerns raised in the TBT Committee between January 1995 and June 2011.¹³ The SPS STC Database provides information on the 312 concerns raised between January 1995 and December 2010. Each of these corresponds to a concern raised by one or more members in relation to a measure taken by one of their trading partners. Since some of these measures might have been notified to the WTO, the concern might be related to one or several notifications of the member taking the measure. The main difficulty with the codification was to attribute product codes from the Harmonized System (the system used by participating countries to classify traded goods on a common basis).¹⁴

Disputes

Disputes initiated by members under the WTO dispute mechanism are another source of potentially interesting information on the effects of non-tariff measures. The WTO Secretariat maintains a database on “requests for consultations”, the first step in formally initiating a dispute in the WTO. As of 31 December 2011, the database had information on 427 such requests.¹⁵ These data do not indicate the type of non-tariff measure at issue in the disputes, but the WTO agreement(s) and provision(s) cited in each dispute are listed. Using the latter, it is possible to obtain an estimate of the number of cases involving each type of non-tariff measure. When doing this, however, it is important to bear in mind that for economic and political reasons, a number of NTM-related trade distortions may go unchallenged. As with specific trade concerns, there is no reason to believe that the measures challenged were statistically representative of all the NTM-related trade distortions faced by members.¹⁶

Another problem with this approach is that for any dispute, complainants tend to cite a large number of provisions which have allegedly been breached, while in fact some of the provisions are duplicates or intimately related to other provisions. The GATT, for example, is cited in most disputes because it includes the basic rules that apply to trade in goods. Moreover, even when a complainant brings a dispute under a more specific agreement, such as the TBT Agreement, it may also include claims under the GATT, such as under Article III:4. This means that a simple count of the number of provisions cited in the cases would lead to an over-estimation of the number of NTMs that have been challenged.

Santana and Jackson (2012) propose a methodology to obtain a more precise view of the types of measures that are the subject of WTO dispute settlement by adjusting for the citation to the GATT in disputes where that agreement may have played a secondary role. Using this methodology, they have compiled a dataset on WTO disputes based largely on the database of requests for consultations maintained by the WTO legal division.¹⁷ This dataset is not publicly available, but it is consistent with a database on WTO disputes accessible on the World Bank's website (see below). In their dataset, Jackson and Santana do not "double count" requests for consultations that refer to the GATT when the reference is likely to be of secondary importance to the main claim of violation (i.e. a specialized agreement or another GATT article). They have also restricted coverage to disputes related to trade in goods. This covers a total of 393 disputes out of the 427 filed under the Dispute Settlement Understanding (DSU) as of 31 December 2011.

(b) Non-WTO sources of information

(i) Data collected from official sources

TRAINS and Market Access Map

The most complete collection of publicly available information on non-tariff measures is the Trade Analysis and Information System (TRAINS) developed by the United Nations Conference on Trade and Development (UNCTAD). UNCTAD started collecting NTM information in 1994 and simultaneously developed the TRAINS database.¹⁸ TRAINS provides information on trade, tariffs and NTMs by Harmonized System (HS) tariff line. NTMs were classified according to a customized Coding System of Trade Control Measures, which distinguished six core categories of NTMs. The database includes between one and seven years of NTM information for 86 countries over the period 1992 to 2010. For some countries/years, in particular after 2001, data were collected only for a sub-set of NTM categories. Various sources were used to provide data, including, where available, WTO sources such as notifications.¹⁹ Overall, the coverage is patchy, resulting in blank cells which are difficult to interpret. They can signify missing data or indicate that a particular NTM is not applied to a particular tariff line.

In the early 2000s, it became clear that the TRAINS database required substantial improvement and that the Coding System needed an update to reflect new practices. In 2005, the Secretary General of UNCTAD launched a project aimed at revamping the definition, classification, collection and quantification of non-tariff measures.²⁰ Under the guidance of a Group of Eminent Persons, a multi-agency team composed of experts from all international agencies active in the NTM area started working on the project. In 2009, the multi-agency team proposed an updated and

modified version of the old Coding System including 16 categories (see Table C.2) which brought the classification closer to the regulatory framework.²¹ A pilot project on the collection and quantification of NTMs was carried out by UNCTAD and the International Trade Centre (ITC), with a view to testing the new classification. With the support of two UN regional commissions, UNCTAD and ITC collected NTM information in seven developing countries.²² Based on the lessons learned in the pilot project, the updated NTM classification was finalized and adopted.

The updated classification also introduced the concept of "procedural obstacles", defined as "issues related to the process of application of an NTM, rather than to the measure itself" (United Nations Conference on Trade and Development (UNCTAD), 2010: xvii). An initial list of procedural obstacles was established and tested in a series of interviews with exporting companies carried out as part of the pilot project (see the discussion of business surveys below).²³ On the basis of lessons learned in the pilot project, the initial list of procedural obstacles was revised and expanded.

Table C.3 presents the ten broad categories of procedural obstacles in the list currently used by ITC. The distinction between a non-tariff measure and a procedural obstacle can sometimes be very subtle, and is best illustrated with an example. To import a product, it may be necessary to have a specific certification (an NTM); however, the certification

Table C.2: International classification of non-tariff measures

A	Sanitary and phytosanitary measures
B	Technical barriers to trade
C	Pre-shipment inspection and other formalities
D	Price control measures
E	Licences, quotas, prohibitions and other quantity control measures
F	Charges, taxes and other para-tariff measures
G	Finance measures
H	Anti-competitive measures
I	Trade-related investment measures
J	Distribution restrictions*
K	Restrictions on post-sales services*
L	Subsidies (excluding export subsidies)*
M	Government procurement restrictions*
N	Intellectual property*
O	Rules of origin*
P	Export related measures*

Source: United Nations Conference on Trade and Development (UNCTAD) (2010).

Note: *indicates that no official information is collected by UNCTAD for this category which is only used to collect information from the private sector through surveys and web portals.

authority or testing laboratory can be excessively costly, slow in response or be located in a remote area (procedural obstacles related to the NTM). Information on procedural obstacles can only be collected through surveys or other mechanisms that record complaints.

Following the pilot project phase, ITC, UNCTAD and the World Bank started to collect official data on non-tariff measures.²⁴ Their strategy consisted of hiring local consultants (universities, think tanks or consulting firms) and giving them assistance and guidelines to draw up NTM inventories in collaboration with the ministries and agencies concerned. Relying on outside consultants is intended to address two of the problems that plague self-notification: (i) the wide variety of bodies involved in initiating NTMs; and (ii) the incentives for authorities not to notify in order to avoid exposure. The data collected by consultants are formatted according to international classification by product (at either the tariff-line or HS6 level), together with information on legal sources and enforcing agency, in order to ensure verifiability of the information. The inventories are then approved by national authorities during validation workshops. Finally, the data are verified and added to both the TRAINS and Market Access Map, a database of tariffs and NTMs developed by ITC.

To consolidate cooperation and expand the recent collection efforts, an ambitious multi-agency partnership, Transparency in Trade (TNT), was launched in 2011 by the African Development Bank, ITC, UNCTAD and the World Bank. Using donor financing, the TNT initiative aims at giving a “big push” to data collection, creating a one-stop global information source. It provides a framework through which the four agencies coordinate their data collection efforts to fill key data gaps and work together to strengthen the capacity of institutions in developing countries to collect and report information on trade policies. TNT has four major components: (i) tools (the Market Access Map and the World Bank’s World Integrated Trade Solution portals provide access to the data); (ii) tariff data collection; (iii) non-tariff measures data collection; and (iv) policies affecting

trade in services. Once the first wave of data collection is completed, the challenge facing the TNT partnership will be to move to a more sustainable structure than that provided by donor financing alone.

World Bank Temporary Trade Barriers Database (TTBD)

The World Bank’s Trade Barriers Database (TTBD) website hosts detailed and freely available data on more than 30 different national governments’ use of anti-dumping and countervailing duties since 1980 and of global safeguards since 1995 as well as on China’s use of its specific transitional safeguard.²⁵ The Global Anti-Dumping Database, developed by Chad Bown, with funding from the World Bank, uses original national government documentation to organize information on affected countries, product category (at the HS8 level), type of measure, date of initiation, final imposition of duties, and revocation dates, and even information on the companies involved.

The TTBD website also hosts a public database with information on WTO disputes developed by Henrik Horn and Petros Mavroidis.²⁶ It contains information on all stages of WTO dispute settlement proceedings (e.g. panel reports, appeals, compliance panel reports) for all WTO disputes up to 11 August 2011.

OECD product market regulation

The OECD Economics Department has developed a database consisting of indicators of product market regulation for member states. The aim is to turn qualitative data on laws and regulations that may affect competition into quantitative indicators. The indicators mostly measure regulations that are potentially anti-competitive in areas where competition is viable. With the exception of the foreign direct investment (FDI) restrictiveness index, they do not distinguish between discriminatory and non-discriminatory measures (see Section C.3). The main source of information used for this database is official government responses to the OECD Regulatory Indicators Questionnaire, with only a small fraction of information being drawn from external datasets, thereby guaranteeing a high level of comparability across countries. The indicators are subject to peer review by the national administrations of OECD member countries.

The database proposes several different indicators which have been calculated for various years. First, there is the economy-wide product market regulation (PMR) indicator, which covers domestic regulations both in the manufacturing and services sectors. This has been estimated for 1998 and 2003 for 30 OECD countries (Conway et al., 2005). The economy-wide PMR indicator was subsequently replaced with the integrated PMR indicator, which has been estimated mostly for 2008 for 34 OECD countries (the four additional countries are Chile, Estonia, Israel and

Table C.3: ITC list of procedural obstacles

A	Administrative burdens
B	Information/transparency issues
C	Inconsistent or discriminatory behaviour of officials
D	Time constraints
E	Payment
F	Infrastructural challenges
G	Security
H	Legal constraints
I	Other

Source: International Trade Centre (ITC) (2011).

Slovenia) as well as for Brazil, China, India, Indonesia, Russia and South Africa (Wölfl et al., 2009). The integrated PMR indicator covers general regulatory issues in fields such as public control and price controls, legal and administrative barriers to market entry, and barriers to trade and investment. It also covers some industry-specific regulatory policies, notably in air and rail passenger transport, rail and road freight, telecommunications and retail distribution.

Secondly, in parallel with the PMR indicator, the OECD has developed a set of indicators covering regulation in specific sectors or specific aspects of regulation. The sectoral indicators cover three non-manufacturing sectors, and in particular network industries such as energy (electricity and gas), transport (air, rail and road transport), and communication (post and telecommunications) as well as retail trade and professional services (Conway and Nicoletti, 2006). The energy, transport and communications (ETC) regulation indicator covers measures affecting market entry and public ownership plus vertical integration and market structure, but only in a subset of the seven industries. The retail distribution indicator covers four entry regulations (registration, licences and permits, large outlet restrictions, and protection of incumbents) and two conduct regulations (shop opening hours and price controls). Finally, the professional services indicator covers three market entry and four conduct regulations. The FDI (regulatory) restrictiveness index covers four types of measures: (i) foreign equity restrictions; (ii) screening and prior approval requirements; (iii) rules for key personnel; and (iv) other restrictions on the operation of foreign enterprises (Kalinova et al., 2010). The latest revision of the index covers these four types of measures for all primary sectors (agriculture, forestry, fishing and mining), investments in real estate, five manufacturing sub-sectors and eight services sectors. The FDI restrictiveness indicator is available for 1997, 2003, 2006 and 2010 for 48 countries.

Compared with other indicators of services measures, the family of OECD regulation indicators has a number of advantages. First, the information summarized by the indicators is “objective”, in the sense that it is based on rules, regulations and market conditions rather than on perceptions captured through surveys. Secondly, these indicators provide the broadest coverage of sectors and areas, and the longest time series currently available to compare product market regulation across countries. As discussed in more detail in Section C.3, the PMR indicators cover a wide array of measures relevant to the services sector but they do not match the GATS categories of measures (market access and national treatment limitations; and domestic regulation). Moreover, they are only available for a relatively small group of mostly rich countries.²⁷

(ii) *Business concerns*

Most of the sources discussed so far are sources of official information, whether notified to the WTO or collected from governmental sources. Official information has a number of distinct advantages. First, it is generally reliable. It can be linked back to a legal text and, at least for the WTO sources, it is approved by governments. Secondly, in most cases it is collected in a systematic way.²⁸ However, it also has a few disadvantages, foremost among them that the data are generated/reported by the countries imposing the non-tariff measures. Some of these countries may want to avoid attracting attention to their adoption of new NTMs, or they may simply not deem them worthy of reporting, in which case the incidence of NTMs for individual countries and in aggregate measures could be understated. Furthermore, while evidence suggests that how NTMs are applied or administered can become a “procedural barrier to trade”, governments have absolutely no incentive to document obstacles relating to the specific way in which measures are applied.

Questions relating to procedural obstacles may be better addressed using business surveys or information on firms' own perceptions of the difficulties they face doing business in various markets. Data on exporter perceptions provide a valuable complement to data from official sources because they help identify those measures that are perceived as impediments to trade. These sorts of data, however, reflect firms' judgments and may be subject to various biases. Businesses may exaggerate procedural obstacles – or, on the contrary, minimize them – depending on the circumstances. They may also be unable to identify the specific policies of concern, or may misidentify them. Moreover, surveys, because of problems related to sample size and self-selection of respondents, do not always guarantee rigorous and significant results.²⁹ Similarly, with websites where exporters can file complaints, self-selection leads to a biased statistical sample.

Two sources of business data are presented in this sub-section and used in the next sub-section since they deal directly with non-tariff measures. The first is a set of 11 business surveys conducted by ITC in developing countries. The second is the CoRe NTMs (compilation of reported NTMs) Database compiled by Martinez et al. (2009), which incorporates information from the United States Trade Representative's National Trade Estimate Reports on Foreign Trade Barriers and the European Union's Market Access – Trade Barriers database. These two sources give an overview of barriers faced by firms from two of the largest developed economies. Other business surveys focusing on “ease of doing business” indicators are not discussed here (even though they may contain relevant information) since they require more attention to make sure the correct measures are identified.³⁰

ITC business surveys

Since the end of the pilot project in 2009 (see sub-section 1(b)(i) above), the ITC has carried out large-scale company surveys on non-tariff measures in more than a dozen developing and least-developed countries on all continents.³¹ The surveys cover at least 90 per cent of the total export value of each participating country (excluding minerals and arms).³² The economy is divided into 13 sectors, and all sectors accounting for more than 2 per cent of total exports are included in the survey. Both exporting and importing companies are covered. The survey methodology involves a two-step approach.

In the first step, companies that experience burdensome non-tariff measures are identified through phone conversations with all the companies in the sample. The second step then consists of face-to-face interviews with the companies that reported difficulties with NTMs in the phone conversations. A trained interviewer helps respondents identify the relevant regulation, the nature of the problem, the affected products (six-digit level of the Harmonized System), the partner country exporting or importing the product and the country applying the regulation (partner, transit or home country). The ITC does not implement the survey, but guides and supports a local survey company and experts in doing this. Upon finalizing the survey, its results are presented and discussed at a dissemination workshop, which brings together all national stakeholders and fosters a dialogue on NTM issues.

Compilation of NTMs reported by US and EU exporters

Over the last decade, the Office of Economics of the United States International Trade Commission (USITC) has been engaged in compiling a unified database using the EU's Market Access – Trade Barriers Database and the National Trade Estimate Report on Foreign Trade Barriers issued by the United States Trade Representative (USTR), as well as the WTO's trade policy reviews. The first version of the USITC NTM database dates back to 2002 and is described in Manifold (2002) and Donnelly and Manifold (2005). It was later updated by Martinez et al. (2009).

The EU's Market Access – Trade Barriers Database provides a snapshot of non-tariff barriers faced outside of the EU by exporters from EU members. It is based on complaints registered by EU exporters and processed by the European Commission. The database has 32 sectors and seven main categories of measures: tariffs and duties, trade defence instruments, non-tariff barriers, investment-related barriers, intellectual property rights-related barriers, other (export-related) measures and services-specific measures. Each of those categories is further divided into a number of sub-categories. Non-tariff barriers, for instance, are sub-divided into: registration, documentation and customs; quantitative

restrictions and related measures; competition issues; standards, sanitary and other technical measures; government procurement; subsidies; other non-tariff measures; and sanitary and phytosanitary measures. The USITC database does not include tariffs and trade defence instruments and EU data are reclassified according to the USITC classification.

The National Trade Estimate (NTE) Report on Foreign Trade Barriers is issued annually by the USTR. Its primary focus is on foreign barriers to US exports. The NTE is not a simple business survey. It is based upon information compiled within the USTR, the Department of Commerce and the Department of Agriculture and other US government agencies. It is supplemented with information provided in response to a notice published in the Federal Register (the official journal of the US Government), and with information from members of the private sector trade advisory committees and US embassies abroad. While each country is reviewed in a different way, the discussion typically focuses on individual measures by sector.

Global Trade Alert

In 2009, the Centre for Economic Policy Research (CEPR) teamed up with independent research institutes from around the world to create the Global Trade Alert (GTA) initiative.³³ Their objective was to increase the information available on state measures that may affect trading partners' commercial interests, broadly defined as imports, exports, foreign investments (including intellectual property), and foreign employees. CEPR believed that a combination of peer pressure plus up-to-date, comprehensive information would help avoid the historic mistakes of protectionism of previous eras. In addition to tracking government measures taken during the current global economic downturn, the GTA provides researchers and government officials with information on new patterns of state intervention that are problematic from the perspective of maintaining open borders.

Regional nodes, a network of independent research institutes and trade experts from all over the globe, are responsible for monitoring state measures introduced in their own region (and elsewhere). The GTA initiative also encourages third parties to submit measures for scrutiny, and welcomes dialogue with implementing jurisdictions concerning the measures they have introduced. The Evaluation Group, consisting of the leaders of the regional nodes and chaired by the representative of the network hub (CEPR), is responsible for assessing this information and deciding whether to publish it on the GTA website. The GTA does not confine itself to the measures that are covered by the existing body of WTO agreements. Nor does the initiative pronounce on the WTO legality of a measure or whether a measure is "protectionist".

2. Stylized facts about NTMs related to trade in goods

Currently available databases on non-tariff measures, despite the shortcomings discussed above, can be used to address important questions about trade in goods, including whether such measures have increased over time, how important SPS and TBT measures are compared with other types of NTMs, and how firms perceive the obstacles they face in international markets. This sub-section poses several such questions about NTMs and provides answers in the form of descriptive statistics in order to establish a number of stylized facts about NTMs. Only with a reliable set of facts can researchers hope to make progress in addressing more fundamental questions about NTMs.

(a) Is there evidence of an increasing medium- to long-term trend in NTMs?

To grasp the general trends in non-tariff measures since the mid-1990s, information was first collected from the UNCTAD TRAINS database.³⁴ Panel (a) of Figure C.2 presents the average share of product lines and share of trade value affected by NTMs for all countries for which information has been collected. As explained in more detail in Box C.1, these are inventory-based measures of the intensive margin (value of trade) and the extensive margin (number of lines affected) of trade covered by NTMs, respectively. The shares of lines and trade value covered by NTMs have increased between 1996-2000 and 2001-04, but there is no evidence of a further increase for the 2005-08 period.³⁵

It is well known that the TRAINS database suffers from inconsistent data collection across years. To address this problem, in Panel (b) of Figure C.2 the same information is presented for selected Latin American countries with the most complete NTM information in the database.³⁶ The qualitative results

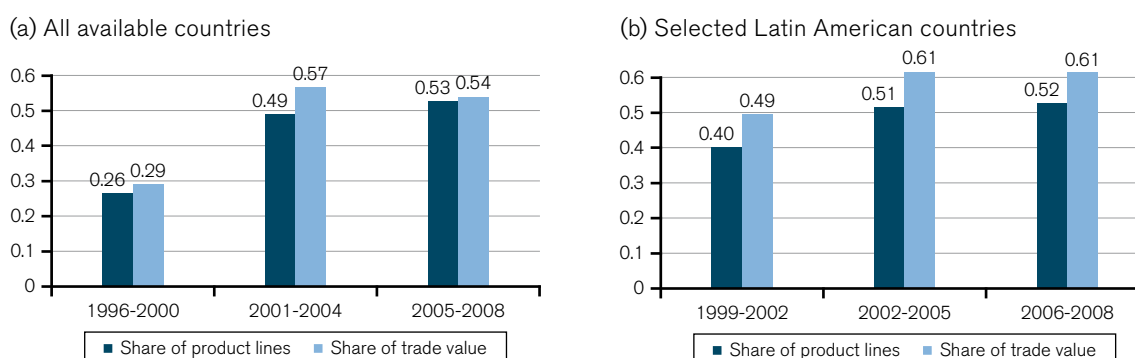
are similar to the ones in Panel (a): the shares of lines and trade value covered by NTMs have increased between 1996-2000 and 2001-04, but there is no evidence of a further increase since the mid-2000s.

Beyond the well-known data limitations, the absence of conclusive evidence of an increasing use of non-tariff measures may be due to different trends of specific NTMs. The focus of this report is, however, on TBT/SPS measures. WTO internal sources of information on notifications and specific trade concerns can be used to display the trends in TBT/SPS measures since 1995. Figure C.3 shows the number of notifications to the WTO and the number of notifying countries since 1995 for both SPS and TBT measures. Both series exhibit upward trends.³⁷

As a caveat, it should be emphasized that WTO members do not have the obligation to notify all measures imposed, but only the new ones being introduced (see Section C.1). Moreover, the mechanism underlying such trends (increasing number of measures or increased compliance with WTO obligations) cannot be clearly identified.

The evidence of an upward trend in the number of SPS and TBT measures notified is supported by complaint-based information contained in the Specific Trade Concerns Database. In Figure C.4, the left axis represents the number of SPS concerns initiated and resolved per year.³⁸ The right axis represents the cumulative number of concerns. It is useful to distinguish between new and resolved concerns because new concerns may signal an increasingly adverse effect of measures or an increasing participation of countries in the specific trade concerns mechanism.³⁹ The rate at which concerns are resolved conveys (partial) information on the effectiveness of the mechanism. The figure shows that both the number of concerns initiated and the number of concerns resolved fluctuate widely between 1995 and 2010. However, due to the fact that the former number is larger than the latter in all years

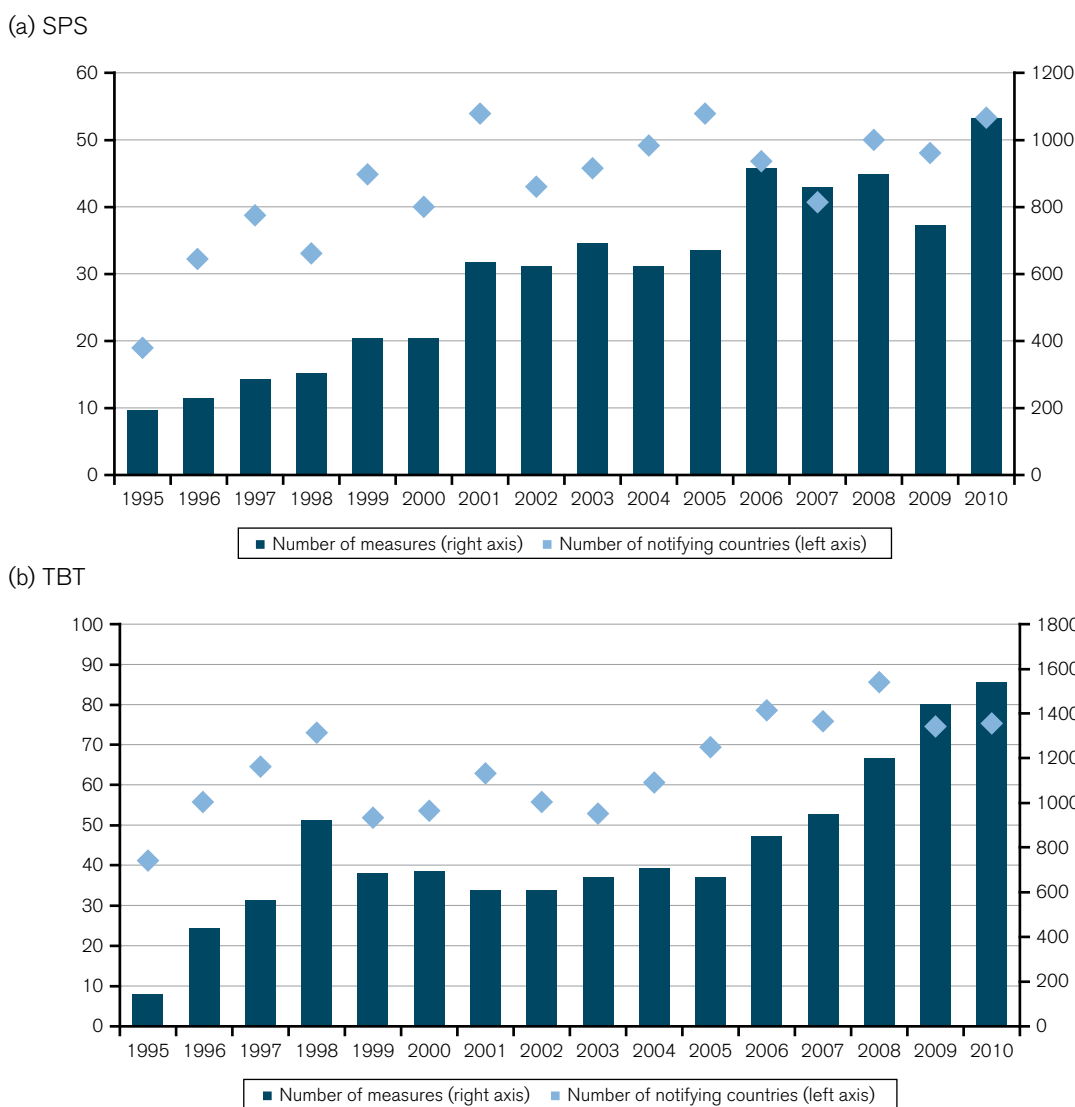
Figure C.2: Shares of product lines and trade value covered by NTMs, 1996-2008 (percentage)



Source: UNCTAD TRAINS.

Note: Latin American countries in Panel (b) include Argentina, Colombia, Ecuador, Peru, Uruguay and the Bolivarian Republic of Venezuela.

Figure C.3: SPS and TBT notifications, 1995-2010
(number of notifying countries and number of notified measures per year)



Source: WTO I-TIP database.

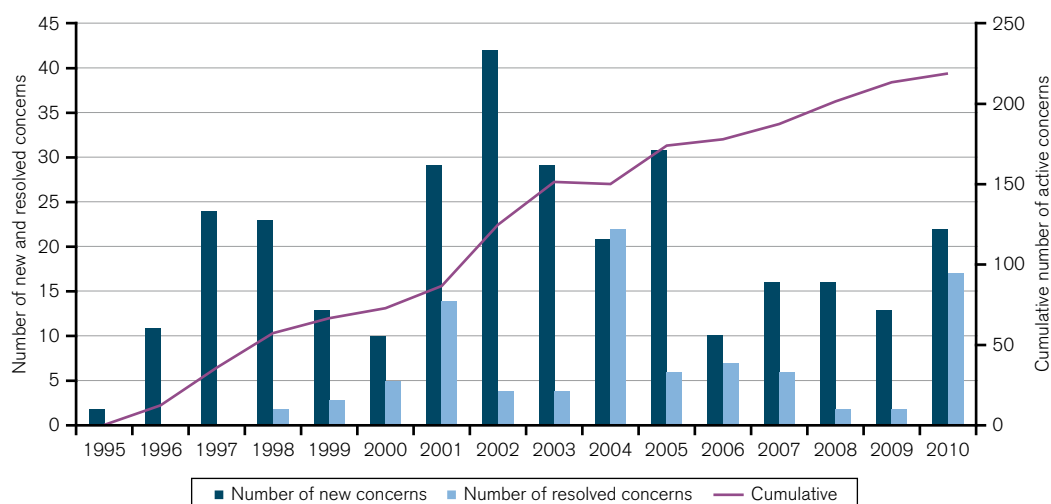
except 2004, the cumulative number of SPS concerns increases over time.

A total of 312 SPS specific trade concerns were raised between 1995 and 2010. Ninety-five (30 per cent) were reported as resolved by WTO members to the SPS Committee. Eighteen (6 per cent) were reported as partially resolved – meaning, for instance, that trade may have been allowed for selected products or by some of the members using the measure in question. No solutions were reported for the remaining 215 trade concerns (64 per cent). However, it is possible that some of these concerns were resolved without the SPS Committee being made aware of these developments. Therefore, the number of resolved concerns in Figure C.4 should be taken as a lower estimate. Table C.4 below documents the fact that disputes citing SPS measures have not increased over time, either as an annual total or as a share of all disputes. This

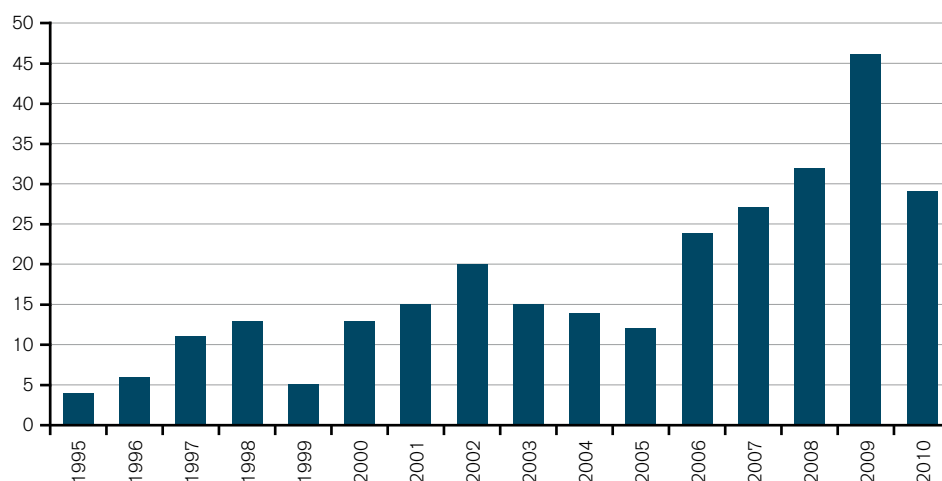
suggests that the specific trade concerns mechanism may be functioning better than the rising number of disputes and notifications in this area would suggest.

In the case of TBT specific trade concerns, only information on initiation of concerns, but not on their termination, is available. The data, shown in Figure C.5, indicate an upward trend in initiations (but with reductions between 1998 and 1999; 2002 and 2005; and 2009 and 2010).

Consistent with the measures-based information from notifications, there is also some indication that an increasing number of countries is involved in raising specific trade concerns or maintaining TBT/SPS measures subject to STCs (see Figure C.6).⁴⁰ A key element is that developing countries are becoming important users of the system – an issue that will be explored in more detail in Section C.2(c).

Figure C.4: New and resolved SPS specific trade concerns, 1995-2010
(number of concerns)


Source: WTO STC Database.

 Figure C.5: New TBT specific trade concerns, 1995-2010
(number of concerns)


Source: WTO STC Database.

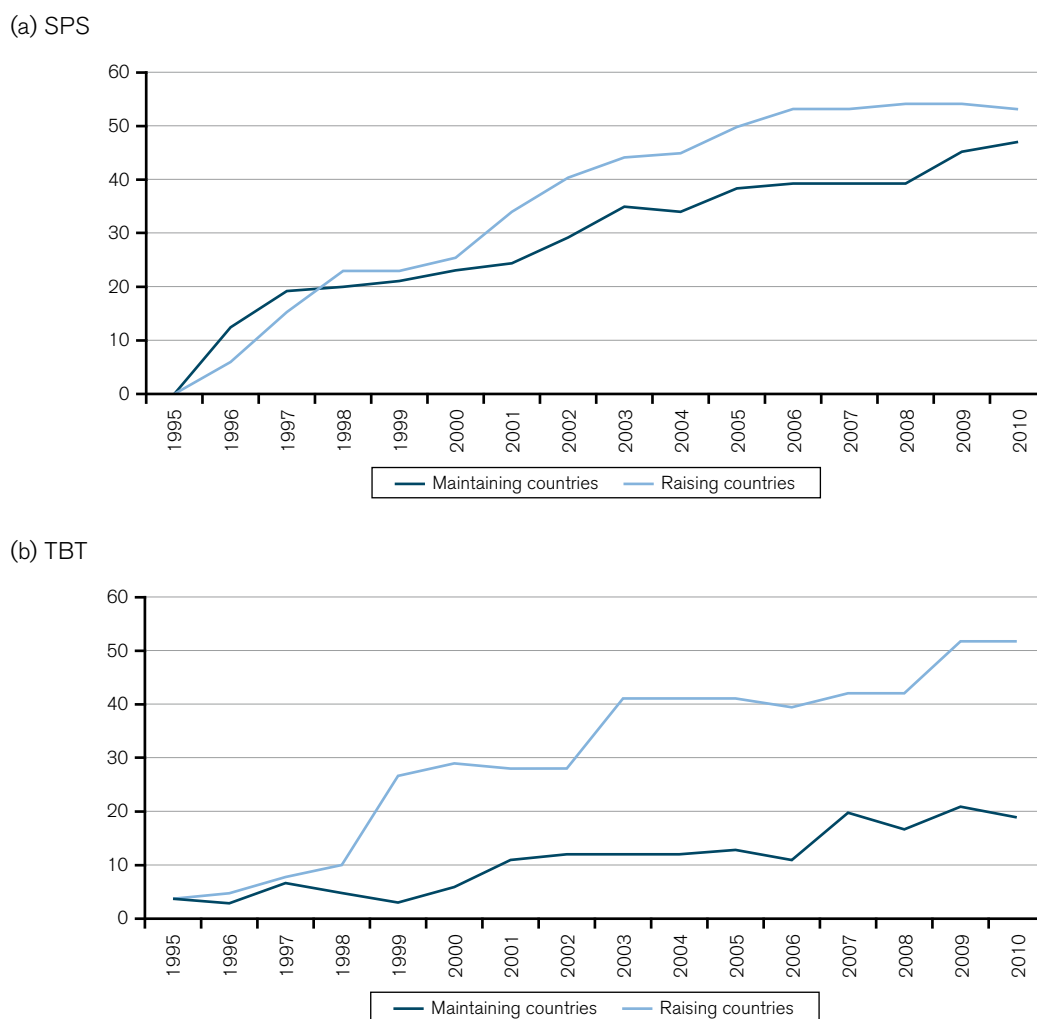
Because the number of “resolved” concerns is based on an assumption in the case of TBT, the descriptive statistics on TBT are to be interpreted with some caution. Moreover, no direct comparison can be made between SPS concerns (upper panel) and TBT concerns (lower panel).

The specific trade concerns data can also provide information on the amount of trade affected by TBT/SPS concerns. Firstly, Figure C.7 shows the average amount of trade per concern initiated. The figure shows that, on average, the import value of an initiated trade concern has been quite stable since 1995, with the exception of two peaks at the end of each decade. In the case of SPS concerns, the peaks occurred in 1997-98 and in 2008. As for TBT concerns, there was a peak in 1999-2000 and another smaller one in 2010.⁴¹

These peaks are due to the filing of concerns involving a wide set of HS2 lines between two or more major trading countries. In the case of the SPS peaks, the first is mainly due to two separate concerns, one on pharmaceutical products raised by the United States, Switzerland, Brazil, Canada, Australia and others against the European Union in 1997, and another on dairy products raised by the European Union against Poland in 1998. The SPS peak in 2008 is mainly due to a complaint by the United States and China, among other countries, against Japan on meat, dairy and most vegetable products.

For TBT concerns, the earlier peak is also a “double peak” spanning the years 1999 and 2000. In 1999, a TBT concern was raised against the European Union by a large set of countries including the United States, China and Japan, involving a wide range of sectors

Figure C.6: Maintaining and raising countries in specific trade concerns, 1995-2010
(number of countries)



Source: WTO I-TIP database.

Note: In the TBT dataset, a concern is assumed to be "resolved" if not raised again for two or more years. A "raising" country is the one which complains about a TBT/SPS measure imposed by a "maintaining" country in the relevant WTO committee.

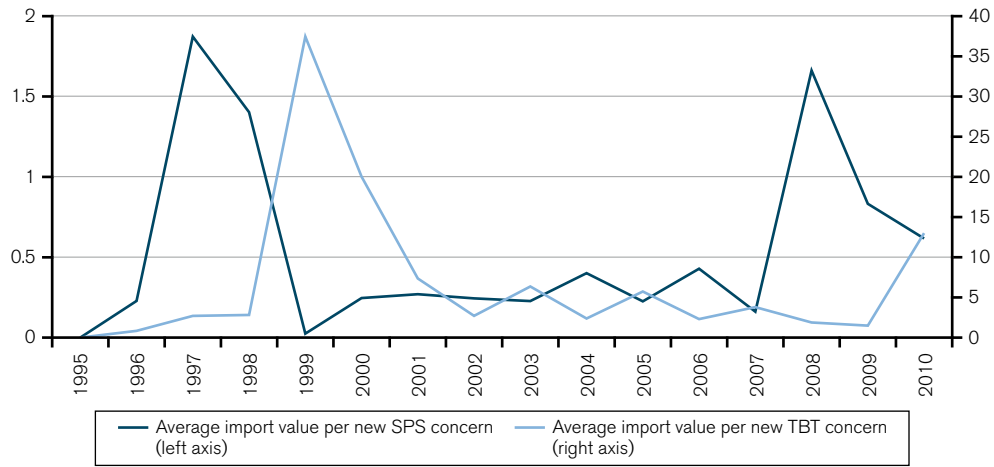
including miscellaneous chemical products, various metals, electrical machinery and toys. Another concern was raised in 2000 by the United States, Canada, Japan and others against the European Union on electrical machinery and instruments. Finally, a TBT peak in 2010 was mainly due to a concern raised by the European Union against the United States, involving a wide set of sectors, including chemicals and plastics.

Secondly, inventory-based measures of the incidence of non-tariff measures, namely frequency and coverage ratios, have been calculated (see Box C.1 for methodology). In this case, too, a specific trade concern in TBT is assumed to be "resolved" if, after its initiation, it is not raised again for two years; no direct comparison can be made between SPS concerns (see Figure C.8(a)) and TBT concerns (see Figure C.8(b)), especially on the absolute amount of trade covered. The

general message is, however, that frequency and coverage ratios are increasing (although not evenly), indicating that SPS and TBT measures subject to specific trade concerns are affecting an increasing number of product lines and an increasing amount of trade.⁴²

Evidence from disputes on trends in TBT/SPS measures is inconclusive. According to Santana and Jackson (2012), the number of disputes citing the SPS and TBT agreements fell between 1995 and 2011, but the drop was consistent with the overall decline in the number of disputes during this period (see Table C.4). Requests for consultations related to SPS measures fell from 18 in 1995-2000 to seven in 2007-11, but the share of SPS cases in the total number of disputes increased to 11 per cent from 9 per cent between these two periods. Disputes citing the TBT Agreement numbered 24 in the earlier period and just eight in the

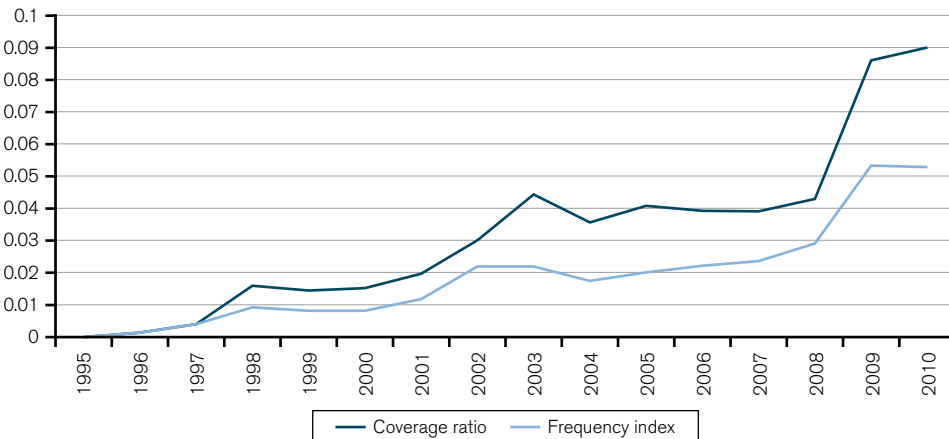
Figure C.7: Average value of initiated SPS and TBT concerns, 1995-2010 (US\$ billion)



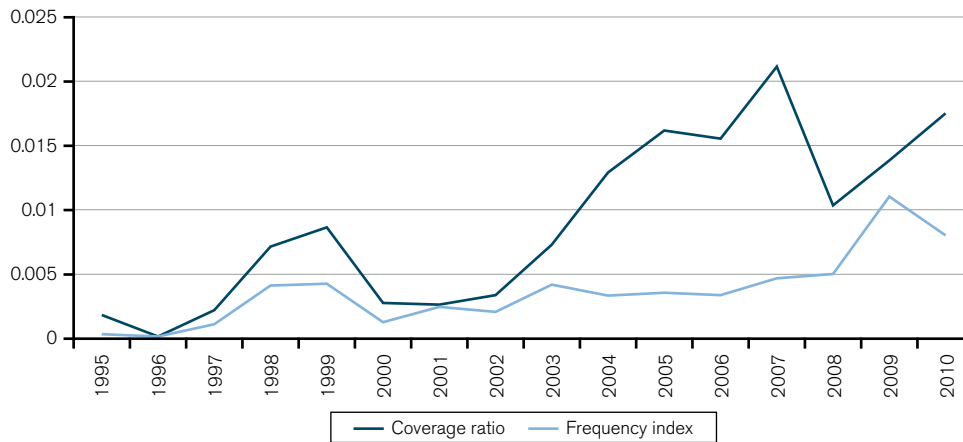
Source: WTO STC Database.

Figure C.8: Coverage ratio and frequency index of STCs aggregated by year, 1995-2010

(a) SPS



(b) TBT



Source: WTO I-TIP database.

Note: In the TBT dataset, a concern is assumed to be "resolved" if not raised again for two or more years.

latter one, but their share in total disputes was roughly the same in both periods, at 12 per cent. The percentage of disputes mentioning TBT measures fell to 4.5 per cent during the 2001-06 period before

returning to 12 per cent, so while there are some signs of a recent rise in this area, there is no indication of a longer-term trend.

Box C.1: Methodology for constructing indices from UNCTAD TRAINS and STC databases

The UNCTAD TRAINS database, as described in Appendix C.1, contains information on non-tariff measures by country and sector for HS6 product lines (a six-digit sub-heading in the Harmonized System classification) and year. Following Bora et al. (2002), for a given country c in a given year t , the share of import lines that are subject to NTMs is defined as follows:

$$SIL = \frac{\sum_i D_i M_i}{\sum_i M_i}$$

In the formula, i indexes HS6 products, D_i is a dummy variable taking value equal to one if an NTM is in place and M_i is a dummy variable equal to one if there are imports of product i .⁴³ The share of import values affected by NTMs is defined as follows:

$$SIV = \frac{\sum_i D_i V_i}{\sum_i V_i}$$

where V_i is the value of imports at the HS6 level and tariff line level and D_i is as above.

Simple averages over countries for each of the years are used. Thus, each year's share of import lines and share of trade value represents the average of a different sample of countries. However, the results with Latin American countries in Figure C.2 are based on a set of countries with information on the same years. Information on the countries to which the NTMs apply was not included. Therefore, the trade partner was chosen to be the world.

The STC Database contains bilateral information at the HS4 sector disaggregation (a four-digit heading in the Harmonized System classification level). The coverage ratio and the frequency index were computed using the following formulae:

$$CR_{c,HS2,t} = \frac{\sum_j \sum_{HS4 \in HS2} \text{imports under NTM}_{c,j,t,HS4}}{\sum_{HS4 \in HS2} \text{imports}_{c,j,t,HS4}}$$

$$FI_{c,HS2,t} = \frac{\sum_j \sum_{HS4 \in HS2} \text{number of positive imports flows under NTM}_{c,j,t,HS4}}{\sum_{HS4 \in HS2} \text{total number of positive imports flows}_{c,j,t,HS4}}$$

where c indexes maintaining countries, j indexes raising countries and t indexes time. In other words, CR is the share of trade under a complaint over total trade for country c , in sector $HS2$ (a two-digit chapter in the Harmonized System classification level) at time t . This is an inventory-based measure of the intensive margin of trade covered by NTMs. FI is the share of the number of product codes covered by a certain NTM over the total number of product codes for which import flows are positive. It is an inventory-based measure of the extensive margin of trade under NTMs. Note that the set of j countries is not the world, but rather the set of raising countries per specific trade concern. This is very different from the TRAINS data. Given this difference, it is not surprising that the shares of trade and lines covered computed from the TRAINS data is larger than the coverage ratios and frequency indexes computed from the STCs data.⁴⁴

For the descriptive statistics used in Section C.2, we average CR and FI across sectors within maintaining country c and time t , and then over all maintaining countries in year t . The former average is weighted by the HS2 sector import share in total imports of c . The latter is a simple average. The end result is a time-varying coverage ratio and frequency index.⁴⁵

It should be emphasized that these indexes are inventory-based measures that do not necessarily capture the trade restrictiveness of a measure, but just how much trade is affected by it (Section D.1 is concerned with the methods used to compute the trade restrictiveness of NTMs). When interpreting them, one has to take into account the issue of endogeneity. For the coverage ratio (or the share of import values affected), the problem is that the value of imports in a given product line is negatively affected by the NTMs imposed on it. For the frequency index (or the share of import lines affected), this endogeneity problem is attenuated, unless the measure eliminates trade altogether. However, this measure is less indicative of the overall and relative importance of the NTM.

Table C.4: Agreements cited in disputes related to trade in goods, 1995-2011
(percentage and number)

	1995-2000	2001-2006	2007-2011	1995-2011
Anti-dumping	16.0	29.1	29.2	22.6
Agriculture	19.1	14.9	13.8	16.8
Textiles and clothing	7.7	0.7	0.0	4.1
Customs valuation	4.6	2.2	4.6	3.8
GATT (adjusted) ^a	55.7	59.0	53.8	56.5
Government procurement	2.1	0.0	0.0	1.0
Import licensing	13.4	6.0	1.5	8.9
Rules of origin	1.5	1.5	3.1	1.8
Subsidies and countervailing measures	19.6	25.4	24.6	22.4
Safeguards	6.2	17.2	6.2	9.9
Sanitary and phytosanitary measures	9.3	9.0	10.8	9.4
Technical barriers to trade	12.4	6.0	12.3	10.2
Trade-related investment measures	8.2	4.5	6.2	6.6
Total number of disputes in goods	194	134	65	393

Source: WTO Secretariat estimates.

Note: Although there were 427 requests for consultations filed under the Dispute Settlement Understanding as of 31 December 2011, this table focuses on 393 disputes in goods, i.e. it excludes 25 disputes with claims mainly involving TRIPS and nine disputes with claims mainly involving the GATS.

^aThis table follows the methodology of Santana and Jackson (2012) to eliminate duplicate citations of the GATT.

- (b) Are TBT/SPS measures more prevalent than other types of non-tariff measures?

(i) *Evidence from official sources*

Recent analysis by the United Nations Conference on Trade and Development (UNCTAD) (2012), using newly collected data on non-tariff measures in 30 developing countries plus the European Union and Japan suggests a significant prevalence of TBT and SPS measures over other NTMs. Together, they cover more products and trade value than “hard measures”, such as price and quantity control measures. This analysis, using the new classification of NTMs discussed in Section C.1, includes separate sub-categories allowing TBT and SPS measures to be distinguished. The former are more prevalent than the latter – a fact that is in line with the descriptive evidence on the number of measures notified to the WTO (see Figure C.3). In particular, the average country imposes TBT measures on about 30 per cent of products and trade and SPS measures on about 15 per cent of products and trade.⁴⁶

(ii) *Evidence from business surveys*

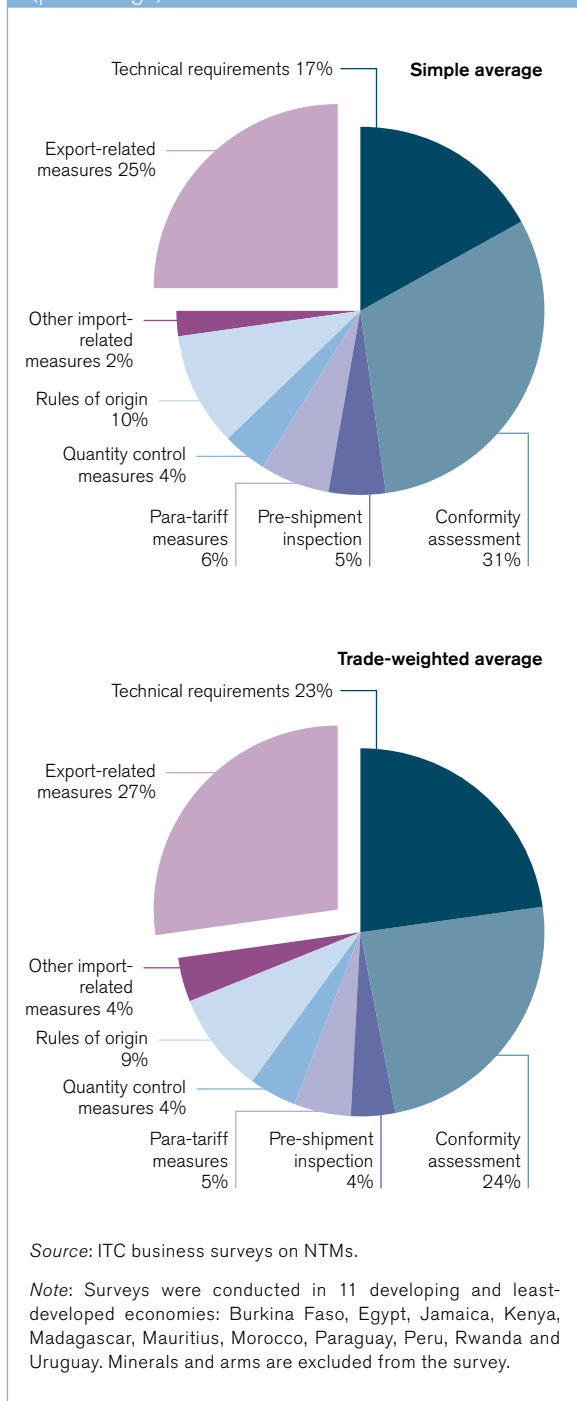
The ITC business surveys provide further evidence of the predominance of TBT/SPS measures in non-tariff measures, or at least in those NTMs perceived as burdensome by firms in the 11 developing and least-developed countries where surveys have been conducted. The data classification used in the surveys is similar but not identical to the multi-agency classification outlined in Table C.2 and Table C.3. TBT and SPS measures are not shown separately in the ITC surveys due to the difficulty of distinguishing these measures from survey responses, but taken together

they correspond to the sum of the categories “technical requirements” and “conformity assessment”. Reports of burdensome NTMs include both measures applied by importing countries and measures imposed by the home country. The former are referred to as “import-related measures” while the latter are classified as “export-related measures”.

Figure C.9 shows the breakdown of reported non-tariff measures by type of measure averaged over the 11 countries surveyed to date. Since some countries are larger than others, a simple average (i.e. the arithmetic mean) may give undue weight to smaller countries at the expense of larger ones. However, using a trade-weighted average (taking the value of each country’s exports in 2010 as weights) does not appear to have a major impact on shares.

The share of technical requirements in total non-tariff measures is somewhat smaller when the simple average is used (17 per cent) than when the trade-weighted average is used (23 per cent), but the reverse is true for conformity assessment (31 per cent compared with 24 per cent). The sum of these two categories is roughly the same in either case (around 48 per cent), which means that TBT/SPS measures comprise nearly half of all NTMs, including export-related measures. Their share in import-related measures is even higher at around 64 per cent, regardless of the weighting structure. Of all “challenging” NTMs reported by exporting companies, about 75 per cent are applied by partner countries and 25 per cent by home countries. Around 10 per cent of firms report a negative impact on their business from rules of origin, whereas other measures are seen as less challenging.

Figure C.9: Burdensome NTMs by type of measure, 2010 (percentage)



The ITC data can be further broken down by sub-category of non-tariff measures. These are shown in Figure C.10 for TBT/SPS measures (i.e. technical requirements plus conformity assessment). Product certification, which is perceived as burdensome by 37 per cent of reporting firms, is the most frequently cited type of measure in this group. It is followed by product testing at 9 per cent, and inspection requirement at 8 per cent. Together, these three NTM sub-types are responsible for more than half of all firm complaints about TBT/SPS measures.

Complying with product certification requirements in export markets can entail significant costs for exporting firms. Some recent numerical examples of these costs are summarized in Section D, Box D.5. These examples relate to costs confronting firms exporting from the United States, but product certification may pose an even greater challenge for exporters located in developing and least-developed economies, since they may have fewer financial and institutional resources to draw upon than firms in developed countries.

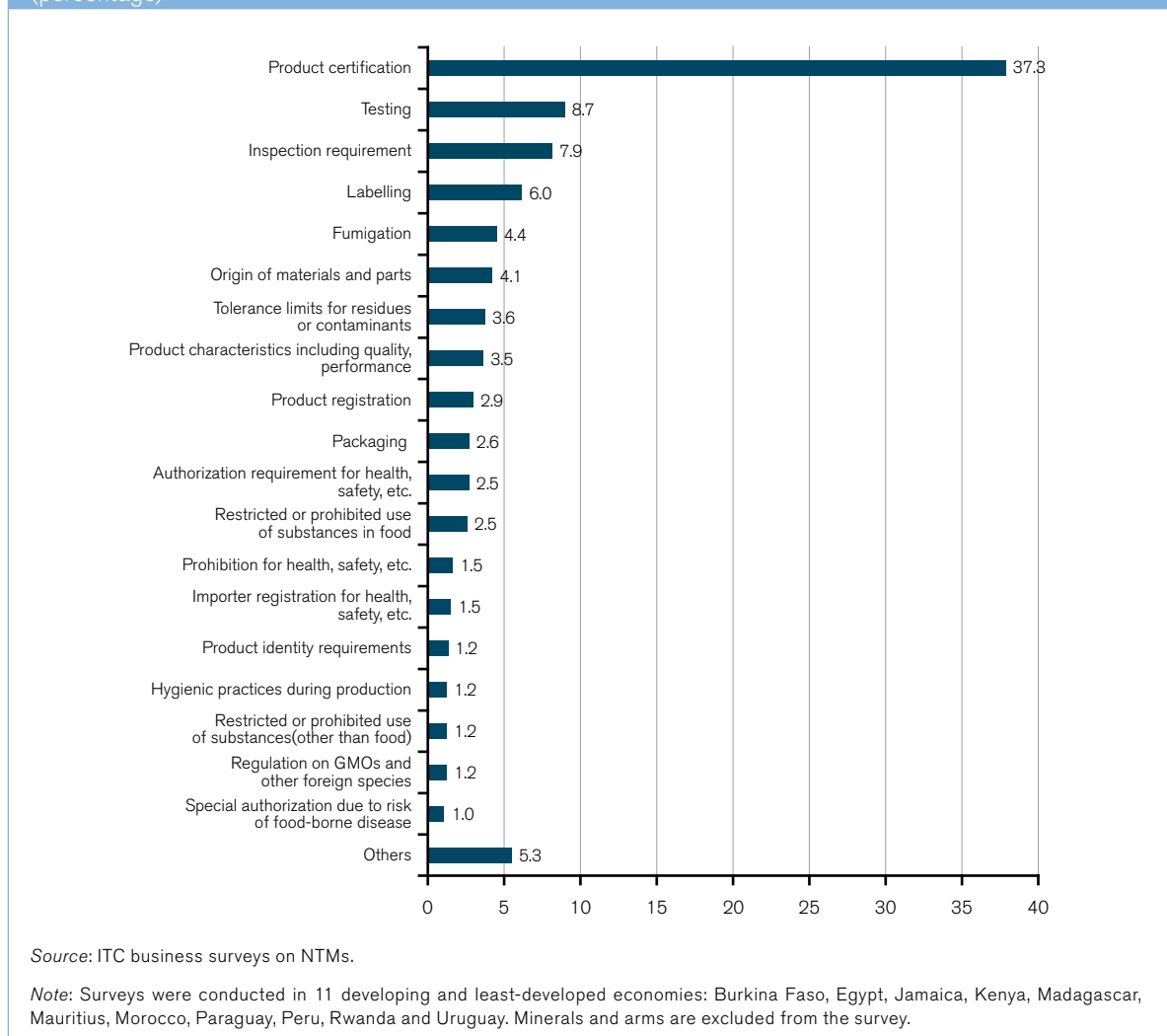
Problems relating to home country certification of exports are nearly as extensive for firms as certification in destination countries, as can be seen in Figure C.11. The export-related measures most frequently cited by firms are certification requirements (26 per cent), export inspection (23 per cent) and obtaining export licences/permits (13 per cent). Together, these three categories account for more than 60 per cent of firm complaints about export-related measures.

As noted in Section C.1, the ITC surveys are based on interviews with firms in a small number of developing economies, and as a result the responses do not represent the concerns and experiences of businesses in developed countries. The three largest developed economies (the United States, the European Union and Japan) all collect data and issue reports on trade barriers facing their exporters in foreign markets, but in general these figures are not publicly available in a format that is amenable to empirical analysis. This situation has been partly remedied by researchers at the US International Trade Commission, Martinez et al. (2009), whose CoRe NTM database merges business surveys from the United States and the European Union with information from WTO trade policy reviews using a single (idiosyncratic) data classification. Figure C.12 makes use of this database, but it excludes the WTO figures in order to focus solely on the concerns of developed economy exporters.

Data for the United States are sourced from the US National Trade Estimate (NTE) while figures for the European Union come from the EU's Market Access Database. Strictly speaking, the US NTE is not a survey, but rather a report based on the findings of several US government agencies and embassies abroad, as well as from private firms. However, the figures should still provide important insight into the priorities of American exporters.

The top five problems facing US exporters are import-related measures (24 per cent), investment measures (20 per cent), standards and testing (12 per cent), SPS measures (10 per cent) and intellectual property rights (9 per cent). The leading concerns of EU firms are SPS measures (35 per cent), standards and testing (16 per cent), anti-competitive practices (9 per cent), intellectual property rights (7 per cent) and import-

Figure C.10: TBT/SPS import-related measures by sub-type, 2010 (percentage)



related measures (6 per cent). The sum of “SPS measures” and “standards and testing” in Figure C.12 should be roughly equivalent to TBT/SPS measures as defined in Section A.1. TBT/SPS measures appear to be a major concern for the European Union, representing more than half (52 per cent) of all issues reported by EU exporters. However, the equivalent share for the United States is much lower, at 22 per cent. Reasons for this disparity are unclear, but it could be attributable to differences in methodology between the US NTE data and the EU’s Market Access Database.

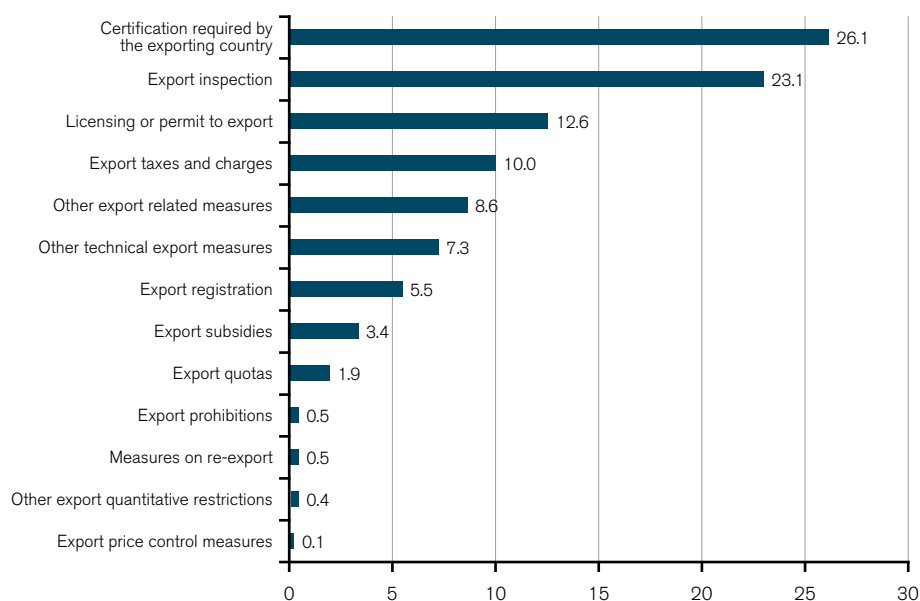
An important difference between the ITC surveys and the US/EU reports is the relatively high importance attached to intellectual property rights by the large developed economies. According to the CoRe NTM data, intellectual property rights account for 9 per cent of complaints from US exporters and 7 per cent of complaints from EU firms. On the other hand, just 0.3 per cent of firms reporting burdensome NTMs in the ITC surveys cited intellectual property as a problem.

The data on disputes in Table C.4 show that requests for consultations citing the SPS and TBT agreements respectively represented 11 per cent and 12 per cent of all cases over the last five years. Although these shares are not exactly small, other agreements were cited more often, including GATT-adjusted (54 per cent), anti-dumping (29 per cent), subsidies/countervailing measures (25 per cent) and the Agreement on Agriculture (14 per cent). This could lead one to conclude that firms’ complaints about TBT/SPS measures do not necessarily translate into government action at the level of the multilateral trading system. On the other hand, it could also be taken as evidence that the specific trade concern mechanism may be resolving complaints before they develop into fully-fledged trade disputes.

- (c) Is there any difference in NTM use between developed and developing economies?⁴⁷

The STC Database sheds light on the type of countries most involved in the mechanism. Figure C.13 presents

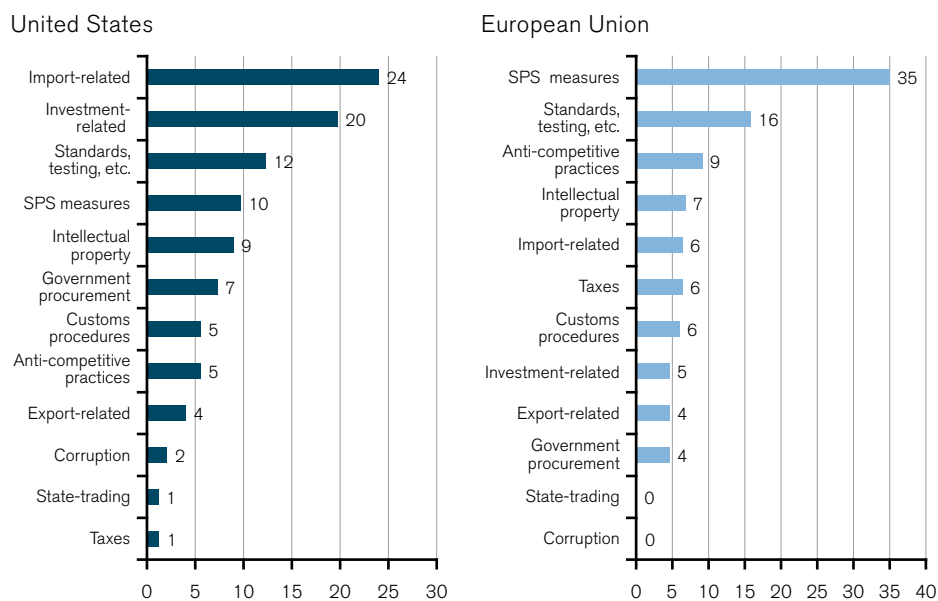
Figure C.11: NTMs applied by home country on exports by sub-type, 2010 (percentage)



Source: ITC business surveys on NTMs.

Note: Surveys were conducted in 11 developing and least-developed economies: Burkina Faso, Egypt, Jamaica, Kenya, Madagascar, Mauritius, Morocco, Paraguay, Peru, Rwanda and Uruguay. Minerals and arms are excluded from the survey.

Figure C.12: Non-tariff measures facing US and EU exporters, 2009 (percentage)

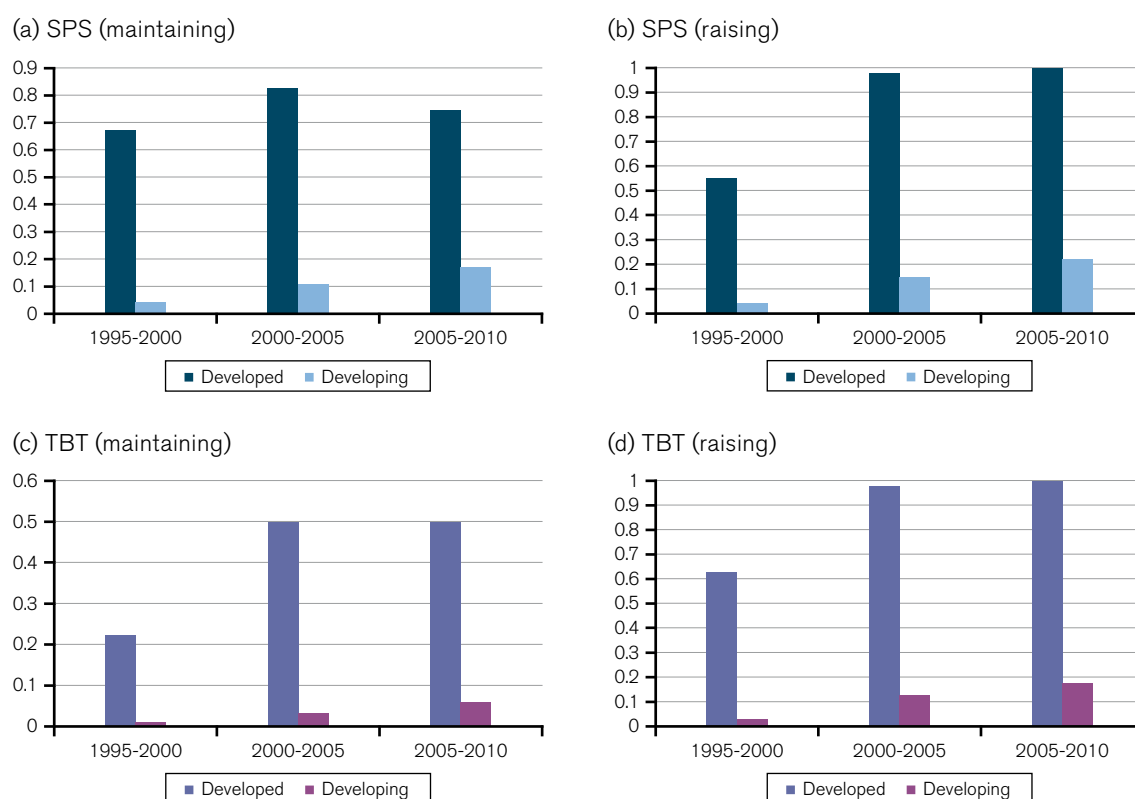


Source: Martinez et al. (2009).

the number of “maintaining” and “raising” countries by income group, calculated as their share in the total number of countries in the respective income group.⁴⁸ The results are clear-cut: developed countries participate more in the specific trade concerns mechanism than developing countries. Moreover,

econometric analysis shows that the amount of trade covered by concerns (coverage ratio and frequency index) is higher when the maintaining country is developed than when the maintaining country is developing, both for SPS and for TBT measures subject to specific trade concerns.⁴⁹ However, the

Figure C.13: Number of STC “maintaining” and “raising” countries as a share of the total number of countries by level of development, 1995-2010 (percentage)



Source: WTO STC Database.

Note: In the TBT dataset, a concern is assumed to be “resolved” if not raised again for two or more years. A “raising” country is the one which complains about a TBT/SPS measure imposed by a “maintaining” country in the relevant WTO committee.

participation of developing countries has steadily increased over the years, not only as raising countries but also as maintaining countries.

The ITC business surveys also find greater use of TBT/SPS measures by developed economies. Figure C.14 shows the share of TBT/SPS measures (i.e. technical requirements plus conformity assessment) in import-related non-tariff measures, broken down by level of development. According to this figure, around three-quarters of burdensome NTMs reported by firms relate to TPT/SPS measures when the importing country is developed, whereas this share falls to around half when the importing country is developing.

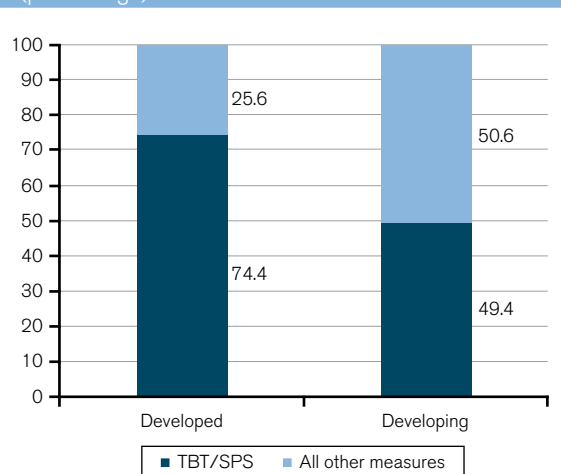
Other survey-based evidence suggests that intra-regional trade between African countries may be subject to a very different set of non-tariff measures. In support of efforts to establish a tri-partite free trade area between the Common Market for Eastern and Southern Africa (COMESA), the East African Community (EAC) and the Southern African Development Community (SADC), an online reporting system has been set up to register complaints about

NTMs and to seek resolution through a consultation process. Kalenga (2012) reviews complaints submitted to the online system between 2008 and 2011 and finds that administrative procedures are the most common source of problems for traders, while TBT/SPS measures play a minor role (see Table C.5). “Customs and administrative entry procedures” were cited in 41 per cent of complaints and “Other procedural problems” were mentioned in another 24 per cent of cases, for a combined total of 65 per cent. SPS and TBT measures were only responsible for 7 per cent and 5 per cent of complaints, respectively, for a total of 12 per cent. This combined share is the same as the share for “Specific limitations”, a category that includes quantitative restrictions and prohibitions. It is difficult to draw strong conclusions from such a small and possibly non-representative sample, but the data do suggest that TBT/SPS measures are much less widely used than other measures between African countries.

(d) Does the incidence of NTMs vary across sectors?

As discussed in Section B, there are good reasons to expect the use of non-tariff measures to vary

Figure C.14: Burdensome NTMs applied by partner countries by level of development, 2010 (percentage)



Source: ITC business surveys on NTMs.

Note: Surveys were conducted in 11 developing and least-developed economies: Burkina Faso, Egypt, Jamaica, Kenya, Madagascar, Mauritius, Morocco, Paraguay, Peru, Rwanda and Uruguay. Minerals and arms are excluded from the survey.

significantly across sectors. Indeed, NTMs appear to affect certain sectors disproportionately, but the extent of the impact is sensitive to the way that sectors are defined. Unfortunately, there is considerable scope for confusion due to the existence of multiple competing statistical definitions. For example, at least three definitions of agricultural products are widely used: the definition from the WTO Agreement on Agriculture (AOA), the definition that appears in the WTO's statistical publications based on the Standard International Trade Classification (SITC), and the first 24 chapters of the Harmonized System (HS) trade nomenclature.

The AOA definition is the narrowest as it reflects negotiating concerns rather than analytical requirements. The SITC-based WTO definition is the

broadest, but it is poorly suited to empirical research since tariffs are generally defined in terms of the HS classification. Chapters 1 to 24 of the HS classification represent a reasonable compromise between an intuitive understanding of what constitutes agricultural products and analytical tractability. For this reason, it is adopted as our standard definition, with non-agricultural products defined negatively as all other products. This should not be confused with non-agricultural products as used in on-agricultural market access (NAMA) negotiations, which are defined as all non-AOA products. The main difference between these definitions is the treatment of fish and fish products, which are taken to be agricultural products in this report but are treated as non-agricultural products in AOA/NAMA. Neither the AOA nor the HS definition includes wood, which may be highly relevant to the SPS Agreement since wood products have been known to harbour invasive species that can be highly damaging to the importing country.⁵⁰

Using the STC Database, one can get a sense of the type of sectors most affected by specific trade concerns. A first distinction is between the agriculture and non-agricultural sectors. Concerns about SPS measures overwhelmingly affect the agriculture sector (251 of the 267 specific trade concerns for which an HS sector could be identified, that is 94 per cent).⁵¹ For TBT measures, out of the 283 specific trade concerns for which an HS sector could be identified, 82 (29 per cent) are in agriculture and 184 (65 per cent) in other sectors.⁵² However, econometric analysis shows that the coverage ratio and the frequency index of TBT measures subject to specific trade concerns are higher in agricultural sectors than non-agricultural ones.⁵³

For both SPS and TBT measures, frequency indexes and coverage ratios are lower in sectors characterized by a higher incidence of intermediate products.⁵⁴ As argued in Section B, the theory of trade agreements under offshoring predicts that, in the presence of trade

Table C.5: Complaints about NTMs in COMESA-EAC-SADC, 2008-11 (number and percentage)

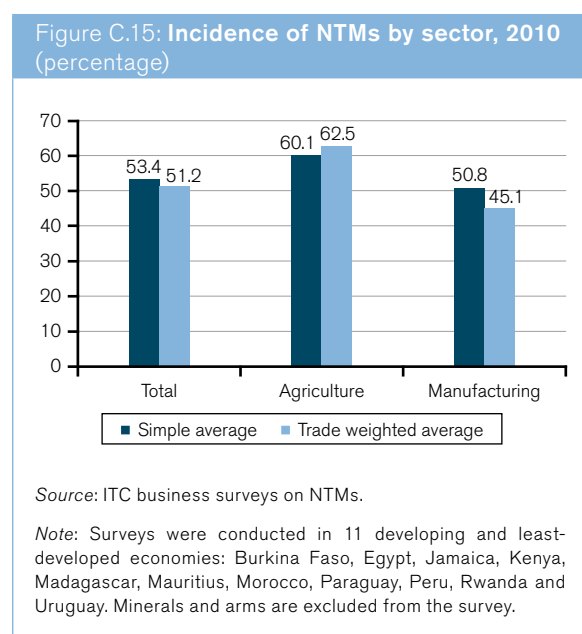
	Number of complaints	Share in total
1: Government participation in trade and restrictive practices tolerated by governments	37	10
2: Customs and administrative procedures	151	41
3: Technical barriers to trade (TBT)	19	5
4: Sanitary and phytosanitary (SPS) measures	24	7
5: Specific limitations	43	12
6: Charges on imports	7	2
7: Other procedural problems	87	24
Total	368	100

Source: COMESA-EAC-SADC online NTM complaint system, Kalenga (2012).

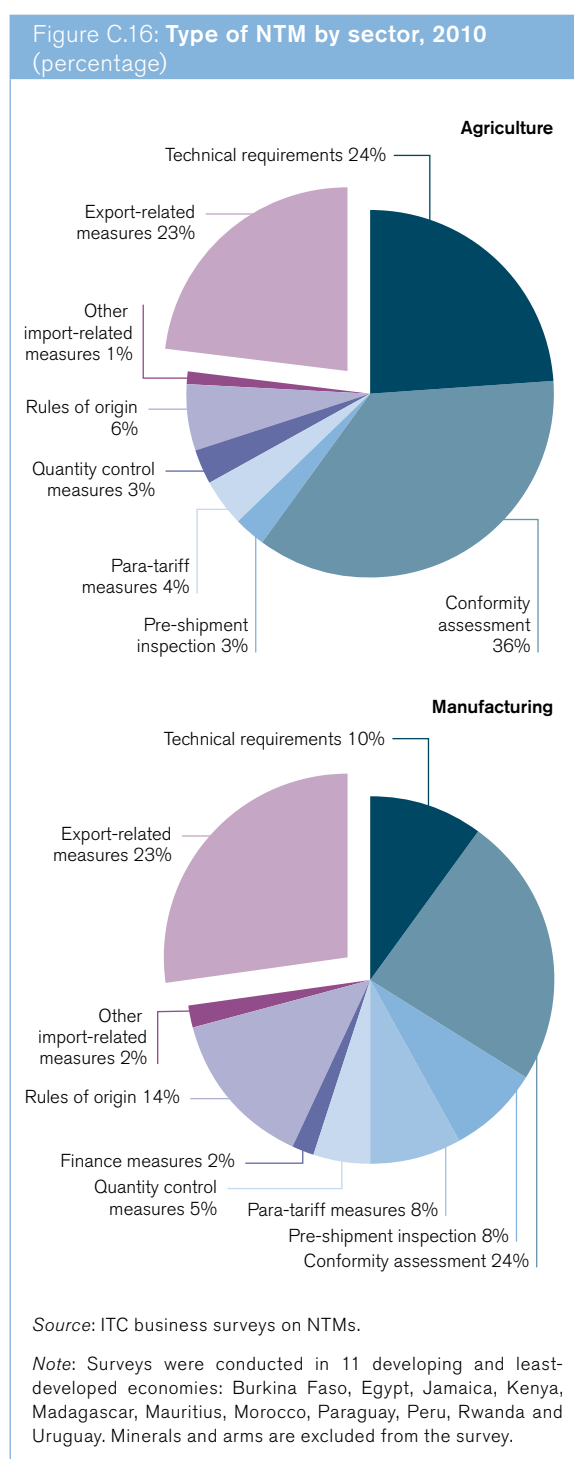
in intermediate inputs and bilateral price bargaining between foreign suppliers and domestic buyers, the level of the behind-the-border non-tax regulatory policies applied to foreign exports is set higher than would be efficient, because of rent-shifting (i.e. shifting profits from the foreign to the domestic producer) (Staiger, 2012).⁵⁵ The regressions of the incidence of TBT/SPS measures on the sectoral share of intermediate products do not constitute a rigorous test of the theory of trade agreements under offshoring. Such a test would require detailed data on the intensity of intermediate products and the amount of bilateral bargaining. However, the result that the amount of trade covered by specific trade concerns is lower in intermediate-intensive sectors seems to indicate that motivations other than rent-shifting may drive the use of TBT/SPS measures in these sectors (see Section E.4 for a detailed discussion).

Evidence that agricultural products are disproportionately affected by non-tariff measures is echoed in the ITC business surveys and illustrated by Figure C.15, which shows the incidence of burdensome NTMs by sector of the reporting firms.⁵⁶ In total, about 53 per cent of businesses said they were negatively affected by NTMs or related obstacles to trade, but this share was higher for businesses in the agricultural sector (60 per cent) and lower among manufacturing firms (51 per cent). These shares were calculated by taking the simple average over the 11 available countries in the ITC surveys, but the contrast between agriculture and manufacturing is somewhat stronger when averages are weighted by exports in each sector. In this case, the incidence of NTMs in agriculture was 63 per cent, whereas it was only 45 per cent for manufacturing.

Not only is the incidence of non-tariff measures higher in the agricultural sector, but different types of



measures are also used compared with the manufacturing sector. Figure C.16 shows the distribution of NTMs by type of measure in agriculture and manufacturing. Exporters of agricultural products report more problems related to TBT/SPS measures (i.e. technical requirements plus conformity assessment) than exporters of manufactured goods (59 per cent for the former, 34 per cent for the latter). On the other hand, pre-shipment inspection, para-tariff measures⁵⁷ and rules of origin (i.e. laws, regulations and administrative procedures which determine a product's country of origin) are comparatively more



challenging for exporters of non-agricultural products. Export-related measures seem to present fewer problems for agricultural exporters than for manufacturers, since the share of these measures in all reported NTM cases is 4 percentage points lower in the agricultural sector (23 per cent) than in manufacturing (27 per cent).

Data on disputes from Santana and Jackson (2012) also point to a higher incidence of TBT/SPS measures in agricultural products (AOA definition) than in non-

agricultural products (see Table C.6). SPS and TBT measures were both cited in 28 per cent of disputes during the 2007-11 period, whereas disputes involving non-agricultural products only mentioned the TBT Agreement 3 per cent of the time and the SPS Agreement not at all. This 28 per cent share in citations was greater than for any other agreement other than the General Agreement on Tariffs and Trade (GATT), which was mentioned in 60 per cent of cases after adjustment to eliminate duplicate citations. TBT/SPS citations in agriculture-related disputes have

Table C.6: Agreements cited in disputes related to trade in agricultural and non-agricultural products^a (percentage and number)

	1995-2000	2001-2006	2007-2011	1995-2011
Agricultural products (AoA definition)				
Anti-dumping	12.3	11.1	12.0	11.8
Agriculture	45.6	31.5	24.0	36.0
Textiles and clothing	1.8	0.0	0.0	0.7
Customs valuation	7.0	1.9	8.0	5.1
General Agreement on Tariffs and Trade (GATT)	59.6	61.1	60.0	60.3
Import licensing	24.6	9.3	0.0	14.0
Rules of origin	1.8	0.0	8.0	2.2
Subsidies and countervailing measures	7.0	20.4	16.0	14.0
Safeguards	8.8	18.5	0.0	11.0
Sanitary and phytosanitary measures	17.5	20.4	28.0	20.6
Technical barriers to trade	17.5	7.4	28.0	15.4
Trade-related investment measures	7.0	5.6	0.0	5.1
Total number of agriculture disputes	57	54	25	136
Non-agricultural products (NAMA)				
Anti-dumping	22.0	42.6	47.1	33.2
Agriculture	0.0	1.5	0.0	0.5
Textiles and clothing	12.0	1.5	0.0	6.4
Customs valuation	2.0	0.0	0.0	1.0
GATT (adjusted) ^b	47.0	54.4	41.2	48.5
Government procurement	2.0	0.0	0.0	1.0
Import licensing	2.0	2.9	2.9	2.5
Rules of origin	2.0	2.9	0.0	2.0
Subsidies and countervailing measures	25.0	30.9	20.6	26.2
Safeguards	7.0	19.1	11.8	119.0
Sanitary and phytosanitary measures	6.0	0.0	0.0	3.0
Technical barriers to trade	13.0	4.4	2.9	8.4
Trade-related investment measures	12.0	4.4	5.9	8.4
Total number of non-agriculture disputes	100	68	34	202

Source: WTO Secretariat estimates.

Note: Although there were 427 requests for consultations filed under the Dispute Settlement Understanding as of 31 December 2011, this table focuses on 393 disputes in goods, i.e. it excludes 25 disputes with claims mainly involving TRIPS and nine disputes with claims mainly involving the GATS.

^aThe breakdown by agriculture/non-agriculture is based on Santana and Jackson (2012). The table excludes 55 disputes involving "generic or mixed" products.

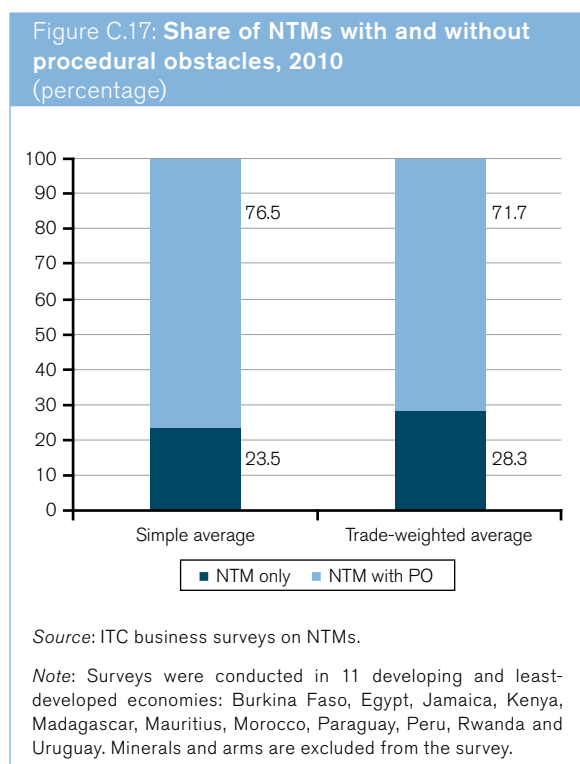
^bThis table follows the methodology of Santana and Jackson (2012) to eliminate duplicate citations of the GATT.

also increased over time, rising from 18 per cent in 1995-2001 to 28 per cent in 2007-11.

(e) What kinds of procedural obstacles are associated with NTMs?

Non-tariff measures pose many challenges for exporting firms, but more often than not it is the manner of implementation rather than the measure itself that causes problems for businesses. As noted in Section C.1, these implementation issues are referred to as “procedural obstacles” in the new multi-agency data classification on NTMs. For example, a country could have very high standards for imported goods, making it difficult for exporters to comply with these standards. On the other hand, exporters that managed to comply with the regulations might still have problems demonstrating their compliance, or else might face long delays before their goods are admitted into the importing country. In the first case, an exporter could perceive the NTM itself to be the main impediment to trade, whereas in the second case they might view the procedural obstacle as the source of their difficulty.

In practice, data on procedural obstacles can only be collected through surveys such as the ITC business surveys. Figure C.17 shows shares of reported non-tariff measures in the ITC surveys with and without procedural obstacles associated with them. The average share of procedural obstacles is 77 per cent if we take the simple average over the 11 countries where surveys have been conducted. The use of a trade-weighted average reduces this share slightly to 72 per cent.



The types of procedural obstacles that businesses report are shown in Figure C.18. The most commonly mentioned obstacle is “time constraints”, including delays related to regulations and short deadlines for submitting documentation. This accounts for 35 per cent of reported obstacles, followed by “high/informal payments” at 22 per cent, and “administrative burdens” at 17 per cent. There are smaller shares for other reported procedural obstacles.

The incidence of procedural obstacles varies widely across different types of non-tariff measures (see Figure C.19). For example, nearly 80 per cent of firms reporting burdensome conformity assessment measures also encountered procedural obstacles. On the other hand, the incidence of procedural obstacles in technical requirements was just 55 per cent. Procedural obstacles were reported less frequently for government procurement restrictions (0 per cent), subsidies (also 0 per cent) and price control measures (25 per cent), including anti-dumping and countervailing measures. They occurred most frequently in measures related to intellectual property (100 per cent) and export-related measures (88 per cent).

(f) How have NTMs evolved since the global financial crisis?

The sharp declines in global trade and output that followed the financial crisis in 2008-09 raised fears of a re-run of the 1930s, when protectionism exacerbated and prolonged the Great Depression. Efforts by the WTO and others to monitor trade policy developments in the aftermath of the crisis initially found that most countries had managed in 2009-10 to avoid the worst

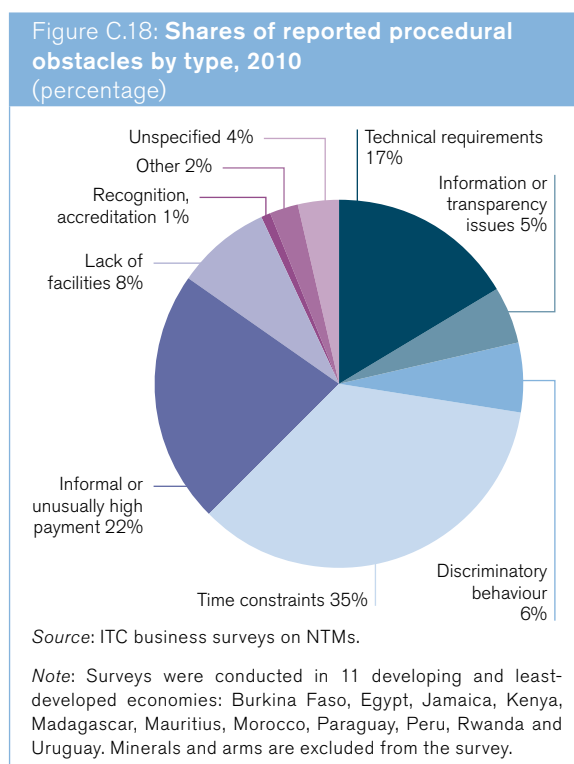
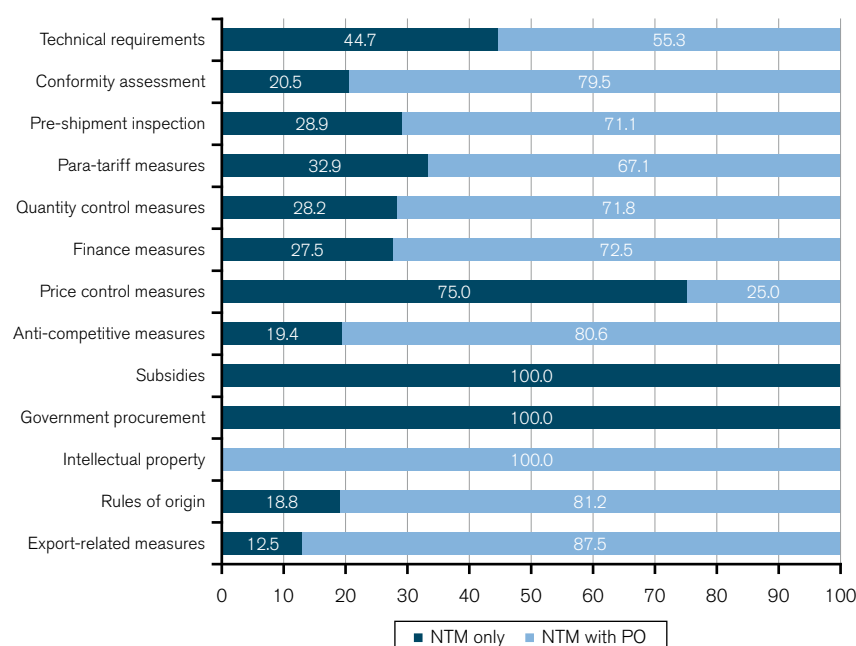


Figure C.19: Shares of NTMs with and without procedural obstacles by type of NTM, 2010 (percentage)



Source: ITC business surveys on NTMs.

Note: Surveys were conducted in 11 developing and least-developed economies: Burkina Faso, Egypt, Jamaica, Kenya, Madagascar, Mauritius, Morocco, Paraguay, Peru, Rwanda and Uruguay. Minerals and arms are excluded from the survey.

forms of protectionism, but developments in 2011 point to increasing trade friction and a rise in the number of restrictive trade measures. To the extent that trade policy has become more restrictive recently, it appears that most of the increase is due to non-tariff measures.

Table C.7 summarizes evidence from WTO monitoring reports since 2008. The number of new restrictive measures rose from 53 in 2008 to 346 in 2009 at the height of the crisis. New restrictive measures then fell back to 306 in 2010 but increased again to 344 in the first 10 months of 2011. The number of liberalizing measures was slightly greater than the number of restrictive ones in 2010, which suggests little or no change in the overall level of protectionism that year. However, there was a net increase in the number of restrictive measures in 2011, as liberalizing actions fell to 304 from 323 in the previous year, while restrictive ones rose to 344 from 306.

Only 8 per cent of restrictive measures introduced in 2008 were tariffs, but this share rose to 16 per cent in 2009, then to 20 per cent in 2010 before falling back to 19 per cent in the first ten months of 2011. Table C.7 excludes TBT and SPS measures, so the tariff share is somewhat exaggerated. SPS and TBT measures are intentionally not tracked in WTO monitoring reports in order to avoid having to make any judgment as to whether such measures are justified on public policy grounds.

In the aftermath of the crisis, countries immediately resorted to trade “remedies”, such as anti-dumping actions and countervailing duties, as evidenced by a sharp increase in the number of restrictive measures from 38 in 2008 to 196 in 2009, but this later fell to 132 in 2010 and to 104 in 2011. In 2010, the number of restrictive trade remedies was roughly equal to the number of liberalizing measures, bringing their net contribution to the stock of restrictive trade measures close to zero, while in 2011 liberalizing actions outnumbered restrictive ones.

One notable feature of Table C.7 is the spike in the number of restrictive non-tariff measures from 30 in 2010 to 81 in 2011. At the same time, the number of liberalizing NTMs fell from 23 to 13. The recent increase in restrictive measures is attributable to a number of developments, including stricter import controls and licensing requirements in some countries, as well as import prohibitions imposed on some Japanese goods following the Fukushima nuclear accident in March 2011. Some of the main countries imposing the new measures in 2011 were Indonesia, India and Argentina.

Evidence from the WTO's monitoring reports leads us to conclude that the use of non-tariff measures has risen relative to tariffs since the financial crisis, although there are exceptions for individual countries. In every year since 2008, new restrictive non-tariff measures have outnumbered liberalizing actions. Meanwhile, the number of liberalizing tariff measures

Table C.7: Trade and trade-related measures, 2008-2011
 (number of new measures)

	2008 ^a		2009		2010		2011 ^b	
	Restrictive	Liberalizing	Restrictive	Liberalizing	Restrictive	Liberalizing	Restrictive	Liberalizing
Trade Remedy	38	30	196	127	132	134	104	118
Anti-dumping	31	29	133	95	97	106	79	107
Countervailing	2	1	23	12	11	8	12	6
Safeguards	5	0	40	20	24	20	13	5
Border	10	12	117	68	98	145	154	137
Tariff	4	11	57	43	61	122	66	124
Tax	0	0	0	0	7	0	7	0
Non-tariff barrier ^c	6	1	60	25	30	23	81	13
Export	2	3	13	10	47	19	66	35
Duty	2	3	4	6	19	3	15	7
Quota	0	0	0	0	3	3	12	6
Ban	0	0	1	1	14	9	23	14
Other	0	0	8	3	11	4	16	8
Other	3	1	20	12	29	25	20	14
Total	53	46	346	217	306	323	344	304

^aCovers the period from October to December 2008.

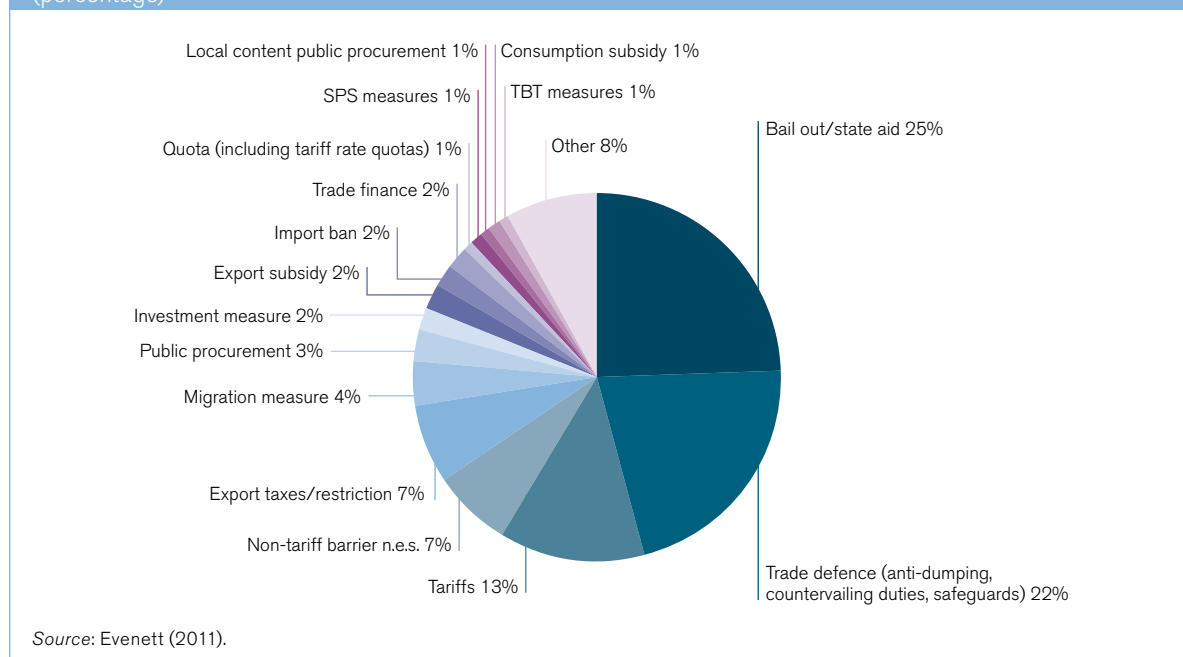
^bUp to mid-October 2011.

^cExcluding SPS and TBT measures.

Source: WTO Secretariat Monitoring Reports.

has been greater than the number of restrictive tariff measures in every period except 2009. Regarding the relative importance of tariffs and NTMs, data from the Global Trade Alert are largely consistent with the

findings of WTO monitoring reports. According to the Ninth GTA Report, tariffs accounted for just 13 per cent of all new, clearly restrictive trade measures introduced since 2009 (see Figure C.20).⁵⁸

 Figure C.20: Composition of new restrictive trade measures, 2008-2011
 (percentage)


3. Services measures

This sub-section discusses trends in services measures. As mentioned in Section C.1, the WTO's internal sources of information on services measures include notifications and GATS schedules of commitments. GATS Article III.3 notifications, which potentially cover all measures relevant to the Agreement, are plagued with very low compliance rates. Schedules of market access and national treatment commitments provide information on bound policies, but the regimes that are actually applied are often more liberal.⁵⁹ Such WTO internal sources of information are of very limited use when assessing services measures applied by WTO members. Therefore, this sub-section considers non-WTO sources of information, asking whether they help to shed light on the trends in services measures.

A serious limitation of the current data on services measures is that they allow to a very limited extent the distinction between market access and national treatment measures and domestic regulation. This distinction is important because these topics raise different issues: improving market contestability (through low barriers to entry and exit) and reducing discrimination, and improving the governance of non-discriminatory regulation, respectively. Moreover, the available information on domestic regulation is limited in coverage and time frame and, in most cases, it only includes relatively poor proxies.

International organizations, such as the Organisation for Economic Cooperation and Development (OECD) and the World Bank, are currently running projects to produce Services Trade Restrictiveness Indexes (STRIs). STRIs were first estimated by the Australia Productivity Commission (APC), but only for a cross-section of countries (no time series information is available). The STRI produced by the APC cannot therefore be used to analyse trends over time. The

indexes produced by the World Bank and the OECD have not been made publicly available, yet. For this reason, a discussion of STRIs is restricted to the methodology (see Box C.2).

(a) What are the trends in services measures?

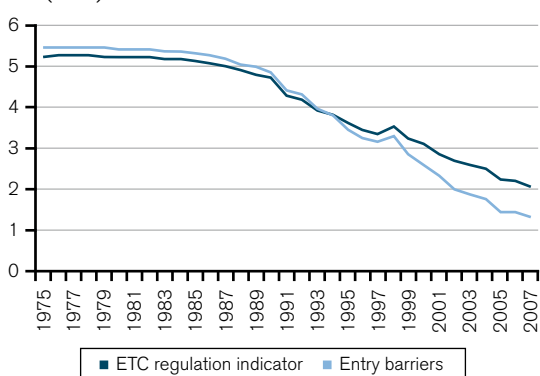
As discussed in Section C.1, the main available source of internationally comparable information on services measures is the Product Market Regulations (PMR) data from the OECD. The PMR indicators include information on economy-wide laws and regulations that are potentially anti-competitive in areas where competition is viable. The sub-set of the Non-Manufacturing Regulation (NMR) indicators, in turn, only covers specific services. NMR indicators also measure regulations that curb efficiency-enhancing competition (Conway and Nicoletti, 2006).

As documented by Wölfl et al. (2009), there has been a downward trend in the regulatory barriers to competition, measured by the PMR, in OECD countries since the late 1990s.⁶⁰ Regulatory barriers to competition have also decreased in network services sectors, such as energy, transport and communications since the mid-1970s, as shown in Panel (a) of Figure C.21. For professional services, too, there has been a downward trend in overall regulation (averaged across all professions) over time, as shown in Panel (b) of Figure C.21.⁶¹

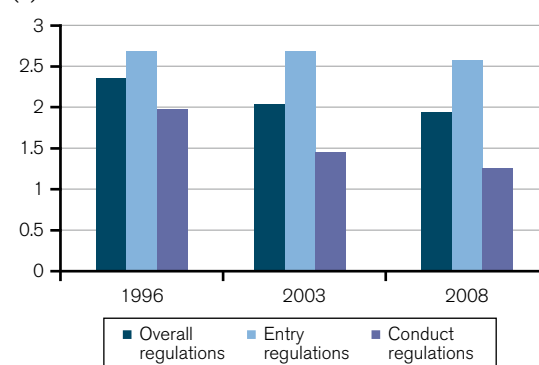
It is not possible to establish a link between the types of indicators discussed above and the GATS categories of market access (Article XVI), national treatment (Article XVII) and domestic regulation (Article VI.4). As an illustration, consider the NMR indicators for professional services. Entry regulations include licensing limitations (that are market access limitations covered by GATS Article XVI), education requirements (that are domestic regulation covered by GATS

Figure C.21: Time trend of NMR indicators in selected services sectors (number of regulations)

(a) Energy, transport and communications (ETC) sectors



(b) Professional services



Source: OECD NMR dataset.

Article VI.4) and quotas/economic needs tests for foreign providers (that are at the same time limitations to market access and national treatment, respectively covered by GATS Articles XVI and XVII). The indicator for conduct regulation covers anti-competitive regulations on prices and fees, advertising, form of business and inter-professional cooperation. While regulations on the form of business are market access

limitations covered by GATS Article XVI, the other regulations are more generally covered by the GATS under Article I as “measures affecting trade in services”. A downward trend of product market regulation in services may reflect a reduction in limitations to market access or national treatment, but it may also be due to changes in the stringency of domestic regulation.

Box C.2: Trade restrictiveness indexes for services

The Australian Productivity Commission (APC) pioneered the estimation of a Services Trade Restrictiveness Index (STRI) (Findlay and Warren, 2000). The APC compiled information on measures in the 1990s that potentially restricted trade in services, covering a wide range of sectors across countries. Most of the information was based on the texts of regulations, but some sectors also include information from outcome measures and the *de facto* implementation of regulations. In constructing the index, the APC distinguished between measures affecting market entry (fixed costs) and those affecting the post-entry operations of a firm (variable costs). Within each category, measures can either be non-discriminatory or discriminatory. For example, a non-discriminatory measure affecting market entry may limit the number of service providers in the telecommunications sector of a given country regardless of nationality, whereas a discriminatory measure would impose national quotas for foreign firms or ceilings on maximum foreign equity participation. Similarly, a non-discriminatory measure affecting post-entry operations may stipulate, for instance, a minimum capital requirement for all insurance firms, whereas a discriminatory measure would entail additional capital requirements for foreign suppliers (Francois and Hoekman, 2010).

Scores were assigned for each restriction by experts on the basis of a judgement about its stringency. For instance, an economy that restricts the number of banking licences was assigned a higher score than an economy that issues new banking licences with only prudential requirements. Next, the different restrictions were combined in a weighted average, once again according to an expert value judgement about their relative economic cost. For example, restrictions on banking licences were assigned larger weights than restrictions on the temporary movement of people. The weights were chosen so that the resulting restrictiveness index score ranges from zero to one. *De facto*, the trade restrictiveness index for each economy comprises two indexes – a foreign trade restrictiveness index and a domestic trade restrictiveness index. The foreign index score includes both discriminatory and non-discriminatory restrictions, while the domestic index score covers only non-discriminatory restrictions. Hence, the difference between the scores of the two indexes is a measure of the discrimination against foreigners (McGuire, 2008). Some studies in the trade literature have used these STRIs to estimate the price effects of services measures, taking account of standard determinants of performance for the sector concerned.

Beyond the limited country and time coverage, there are several limitations of such an STRI, outlined by Grünfeld and Moxnes (2003). Firstly, the STRI is not a tariff equivalent; thus it does not provide information on price or cost impacts. Secondly, it does not measure anti-competitive practices, such as price-fixing, market-sharing arrangements and cartels, which constitute impediments to services trade. Thirdly, it is only computed for six industries: banking, telecommunications, maritime services, distribution (wholesale and retail), education and professional services (engineering, architectural and legal).

The construction of STRIs using a methodology of scores and weights based on expert judgement is also being carried out in on-going World Bank research. Discrimination against foreign suppliers for each services sector and mode of supply is mapped on a five-point scale ranging from 0 (for no restrictions) to 1 (highly restricted), with three intermediate levels of restrictiveness (0.25, 0.50 and 0.75). Sector results are aggregated across modes of supply using weights that reflect the judgement of experts on the relative importance of the different modes for a sector. For example, “temporary movement of suppliers” (mode 4) is important for professional services, but not for telecommunications, whereas “commercial presence” or foreign direct investment (mode 3) is the dominant mode for contesting a market. Next, sector STRIs are aggregated into a single measure for the services sector as a whole in each country using sector GDP shares or FDI shares as weights (Gootiiz and Mattoo, 2009a).

The major limitation of the estimates based on the STRIs is that they rely on the judgement of experts to determine the severity of different restrictions. This lends an unavoidable element of subjectivity to the index (Gootiiz and Mattoo, 2009b). In addition, there are conceptual problems with the weights used.

For example, the use of actual FDI flows as weights introduces a bias because highly restricted sectors are likely to experience less FDI and therefore are allocated too low a weight. Similarly, using GDP weights, sectors such as health, with relatively large shares of GDP, are subject to a low number of restrictions, whereas those with low shares of GDP, such as transport, electricity and finance, are generally highly restricted sectors.

A recent study by the OECD (2009) analyses alternatives to the expert-based methodology for constructing STRIs. It argues that a less subjective weighting scheme could be based on impact analysis – estimating the direct impact of different services measures on trade using regression techniques. The study also identifies principal component analysis (PCA) as a possible weighting scheme. Exploring the statistical properties of the underlying data, this method first groups together individual measures that are highly correlated. It then creates weights based on each group's contribution to the overall variation in the observed outcome, i.e. services trade.

Another distinction that is only partially captured by PMR indicators is the one between discriminatory and non-discriminatory services measures (as defined in Section B.2).⁶² This distinction is important for policy-making. Using data for 34 economies in the Asia Pacific, European and American regions, Nguyen-Hong (2000) finds that price-cost margins of engineering firms are negatively affected by non-discriminatory measures that restrict entry and positively affected by discriminatory measures on foreign establishment and operation. Increases in price-cost margins are interpreted as indirect evidence of the rent-creating (i.e. profit-generating) effects of restrictions, while reductions in such margins are interpreted as indirect evidence of cost-creating effects. This suggests that non-discriminatory measures are likely to raise costs, while discriminatory policies such as nationality or residency requirements generate additional profits for domestic incumbents (Francois and Hoekman, 2010).

The Australia Productivity Commission's STRI is a first source of information on discrimination against foreign providers of services. Findlay and Warren (2000) present ample evidence that there is significant discrimination, both in the establishment of foreign services providers and in the conduct of their operations. As argued in Box C.2, the amount of discrimination is calculated as the difference between the foreign STRI and the domestic STRI.

Secondly, some evidence on the extent of discrimination can be gathered from the OECD PMR indicator "discriminatory procedures" (DPs). This indicator includes information on whether there is "general" discrimination and "competition" discrimination against foreign firms. Among the questions pertaining to "general discrimination", there is one asking whether the country "has specific provisions which require or encourage explicit recognition of the national treatment principle when applying regulations, so as to guarantee non-discrimination between foreign and domestic firms, goods or services".⁶³ Like the general PMR indicator, discriminatory procedures have also, on average, decreased over time.⁶⁴

A third source of information on discrimination in services regulations is contained in the OECD's FDI

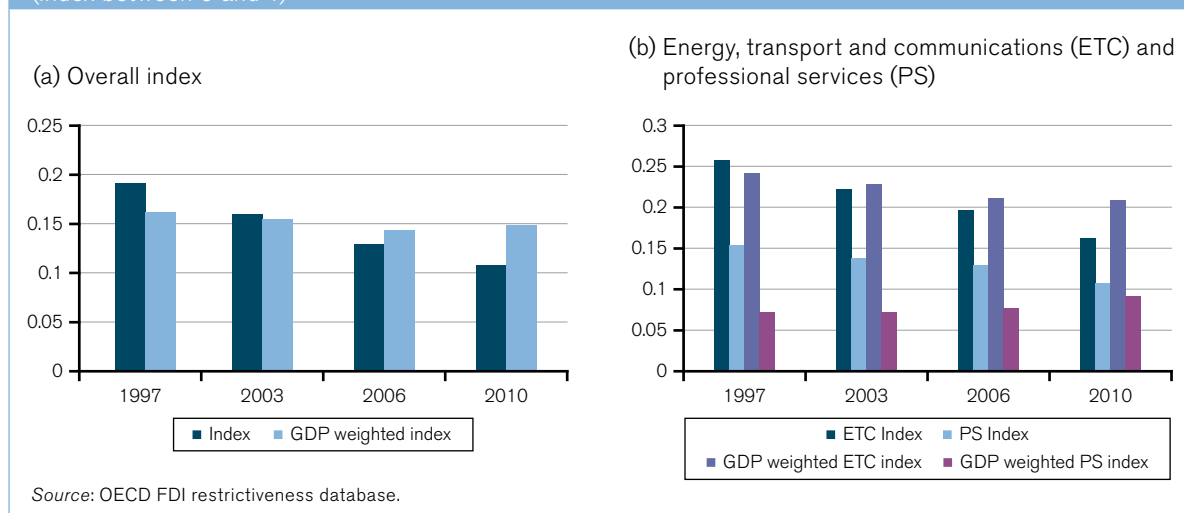
Restrictiveness Index. The index summarizes, for a number of manufacturing and services sectors, the extent to which foreign investment is restricted. This constitutes, by definition, a discriminatory restriction. Based on the OECD data, three indexes that are relevant to services sectors have been created: an overall index; an index for electricity, transport and communications sectors; and an index for professional services.⁶⁵ These indexes provide information on GATS mode 3 restrictions.

FDI restrictiveness in services varies across countries, as shown in Kalinova et al. (2010).⁶⁶ There is also some evidence of a downward trend in FDI restrictiveness indicators, both for the overall index and for the ETC and professional services indexes. For the overall index, Panel (a) of Figure C.22 clearly shows that the unweighted average across countries decreases over time, while the GDP weighted average is more stable over time, probably because rich countries start from low levels of FDI restrictions. Likewise, Panel (b) of Figure C.22 shows a downward trend in the unweighted averages, and a less clear pattern of GDP weighted averages, of the ETC and professional services indicators. Regression analysis, however, reveals that the overall, ETC and professional services indexes all decrease over the sample period.⁶⁷ Moreover, as discussed in Box C.3, most of the reduction in the FDI restrictiveness indexes is driven by a reduction in foreign equity restrictions.

(b) Domestic regulation

Measuring domestic regulation in services is difficult. Most, if not all, domestic regulation is sector-specific. To provide a couple of examples, specific qualification and licensing requirements and procedures apply to professional services providers, such as architects or engineers; technical standards on capital requirements discipline the provision of financial services by financial intermediaries. Moreover, a regulation may not be burdensome *per se*, but rather because of the way in which it is implemented. Given the inherent difficulties in measuring domestic regulation, it is hardly surprising that most available proxies are rather poor.

Figure C.22: FDI restrictiveness in services, evolution over time (index between 0 and 1)



Despite the absence of a clear correspondence with the GATS, PMR indicators have been used in the trade literature to proxy for domestic regulation mentioned in GATS Article VI.4. In particular, Kox and Nordås (2007) select the sub-set of indicators that, according to them, comes closest to covering the regulation mentioned in GATS Article VI.4. They drop all of the state control measures, reconstructing the PMR indicator using only two main components (with equal weight): “barriers to entry” and “barriers to trade and investment”.

Barriers to entry is an equal-weight aggregation of “regulatory and administrative opacity”, “administrative burden on start-ups” and “barriers to competition”. Barriers to trade and investment is an equal-weight aggregation of “discriminatory procedures” and “regulatory barriers”. As partly acknowledged by the authors themselves, it is however unclear to what extent the reconstructed PMR captures the regulatory barriers that come closer to the ones falling under GATS Article VI.4.

Among the PMR indicators, the one that is most closely related to domestic regulation in GATS Article VI.4 is “licences and permits system” (LPS). This indicator comprises three questions (with equal weights): (i) whether the “silence is consent” rule is used (i.e. licences are issued automatically if the competent licensing office has not acted by the end of the statutory response period); (ii) whether there are single contact points (“one-stop shops”) for getting information on notifications and licences; (iii) whether there are single contact points for issuing or accepting notifications and licences.

A “yes” answer receives a score of zero; therefore the lower the indicator, the less burdensome are the licensing requirements. For the sample of 39 OECD and large developing countries on which PMR information exists in 1998, 2003 and 2008, there is some evidence that licence and permit systems have become less burdensome over time.⁶⁸

Box C.3: Decomposition of changes in FDI restrictiveness

The FDI restrictiveness index is constructed as the sum of four components: foreign equity restrictions (FER), screening and approval (SCR), restrictions on key foreign personnel (KPE) and other restrictions (OTR). The average percentage contribution of each component to the growth rate in the total index between 1997 and 2010 is decomposed using the following formula:

$$\gamma^{1997-2010} = \gamma_{FER}^{1997-2010} \theta_{FER}^{1997} + \gamma_{SCR}^{1997-2010} \theta_{SCR}^{1997} + \gamma_{KPE}^{1997-2010} \theta_{KPE}^{1997} + \gamma_{OTR}^{1997-2010} \theta_{OTR}^{1997}$$

where γ 's represent growth rates between 1997 and 2010 and θ_i is the share of sub-indicator i in the FDI restrictiveness index in 1997.

The results, averaged across countries, are presented in Table C.8. FER constituted the most important component of the overall index in 1997 (64.6 per cent) and represented the component with the largest percentage change (-33.7 per cent). All other components accounted for smaller shares in 1997 and smaller growth rates (in absolute value).

Table C.8: Decomposition of growth of FDI restrictiveness in total services, 1997-2010

	Observations	Mean	Standard deviation	Minimum	Maximum
γ (FDI restrictiveness)	38	-37.5	34.2	-92.6	85.6
γ (FER)	38	-33.7	35.7	-91.8	85.6
θ (FER)	38	64.6	25.2	10.2	100.0
γ (SCR)	38	-19.1	38.6	-100.0	12.6
θ (SCR)	38	14.0	23.0	0.0	83.6
γ (KPE)	38	-18.4	34.1	-100.0	0.0
θ (KPE)	38	5.0	9.9	0.0	44.2
γ (OTR)	38	-28.6	61.4	-100.0	150
θ (OTR)	38	16.4	16.9	0.0	71.8

Source: OECD FDI restrictiveness database.

The same decomposition was performed for energy, transport and communications (ETC) and professional services. The results are similar for ETC sectors, where most of the change in the ETC indicator (-38 per cent) was driven by the change in FER (-33.6 per cent). In professional services, FER still represent the most important component of the index. However, this component did not change much over time. Thus, the overall reduction of 29 per cent in the professional services index was mainly driven by reductions in SCR and OTR, with very small contributions from SCR and KPE.

The most reliable information on domestic regulation, coming closer to the types of measures mentioned in Article VI.4 of the GATS, is derived from sector-specific data, namely in financial services. The work by Barth et al. (2008) compiles information on banking regulation in more than 140 countries.⁶⁹ This information is grouped in four main components: entry requirements, capital regulation, official supervisory powers and private monitoring.

Indicators of licence requirements, capital regulation, official supervision, accounting standards and financial statement transparency come closest to the definition of domestic regulation used in this report. As argued in Section D.2, empirical analysis by Kox and Nordås (2007) finds that regulation aiming at ensuring appropriate standards is positively associated with trade in financial services.

4. Conclusions

Although this section of the Report has documented numerous trends and developments in non-tariff measures and services measures, only a few strong results emerge from the analysis for several reasons. First, existing data sources are compromised by large gaps in country coverage, intermittent data collection and a lack of shared terminology. Secondly, some sources of information, such as specific trade concerns and notifications, reflect not only the level of NTM activity but also the degree of engagement with the WTO on the part of its members. Consequently, any visible trends must be viewed with caution. Finally, changes in NTM activity may be relatively small,

making fluctuations in the data more difficult to detect. Despite these problems, some tentative conclusions can be drawn.

The incidence of non-tariff measures does not show any clear trend since the mid-2000s. Such measures appear to have increased in the late 1990s, but between 2000 and 2008 NTM activity was relatively flat, before picking up again in the aftermath of the financial crisis. Whether the post-crisis increase in NTMs is durable remains to be seen, but it certainly is a cause for concern. However, the relative stability of overall NTM activity in recent years must be considered in the context of declines in tariff rates, which have made NTMs more important in relative terms. Moreover, TBT/SPS measures appear to be on the rise. This is important because these types of measures represent a large component of NTMs.

The share of TBT/SPS measures in non-tariff measures is large across most of the major databases, including the ITC surveys. Their lack of prominence in WTO disputes data may be interpreted as suggesting that the specific trade concerns mechanism is effectively defusing issues before they come to a head. Moreover, econometric and survey evidence shows that TBT and SPS measures are employed more often by developed than by developing economies. Such measures appear to be less problematic than cumbersome administrative procedures, i.e. "red tape", only in the case of intra-regional trade in Africa. Implementation issues appear to be the most important source of concerns for exporters from developing countries, including in Africa.

Although available data are problematic in several respects, the fact that similar results are obtained from multiple data sources lends some confidence to these findings. Other research on non-tariff measures also points in a similar direction. In particular, the greater importance of TBT/SPS measures is echoed by Ando and Obashi (2010), who find that “non-core” NTMs (including SPS and TBT measures) have higher frequency ratios than other types of measures in countries in the Association of Southeast Asian Nations (ASEAN), and Fliess (2003), who reports that “technical measures” far outweigh other types of measures. Beghin (2006) also documents an increase in the share of “non-core” measures in NTMs from 55 per cent to 85 per cent between 1994 and 2004. In the future, better data collection could provide a much more detailed picture of the state of NTMs, and TBT/SPS measures in particular.

Turning to services measures, the data situation is even more problematic than for non-tariff measures. A major issue is the weakness of the transparency provisions in the GATS. The notification requirements, in particular, are very limited. Using available non-WTO

sources of information, this report has documented an increasing trend in market contestability in a number of (mostly OECD) countries during the last decades. There is also some evidence that discrimination (in the sense of domestic services and service suppliers being treated differently than their foreign equivalents) has decreased in the last decade. However, a serious limitation of available data is the difficulty in distinguishing between market access, national treatment and domestic regulation.

The proxies for domestic regulation are generally poor and not very informative, except for some sector-specific data in financial services. Clearly, transparency is a major challenge in the area of services measures. Current efforts are geared towards collecting information on applied regimes in market access and national treatment. For domestic regulation, a difficulty is to identify the measures that potentially affect trade in the regulatory regime of a country. Section E.4 discusses various options for the WTO if it is to play a more significant role in improving transparency in this area.

Endnotes

- 1 The members who included non-tariff concessions in their schedules of commitments during the Uruguay Round are Belize, Cameroon, Egypt, El Salvador, Malta, Indonesia, Senegal, and Trinidad and Tobago. In most cases, these concessions provide for the elimination of non-automatic licence requirements on certain products. Those who included non-tariff concessions in their schedules as part of their WTO accession process are China, Saudi Arabia, Chinese Taipei, Ukraine and Viet Nam.
- 2 The tariff quotas are expressed in various quantity units and the in-quota and out-of-quota tariffs are often specific or mixed. As for the commitments to limit domestic support, they are expressed in national currencies from 1994.
- 3 For a detailed discussion of the diversity of notifications and its causes, see Bacchetta et al. (2012).
- 4 Bacchetta et al. (2012) discuss in more detail the metrics of the compliance and quality of notifications and the reasons why both are often low.
- 5 Collins-Williams and Wolfe (2010) discuss the quality of the information provided by subsidies notifications.
- 6 Note that like all other WTO documents, notifications are accessible through the WTO's Documents Online portal.
- 7 The number of notifications corresponds roughly to the number of measures notified as each change in legislation is notified separately and each change in legislation typically involves one measure.
- 8 Reports broadly follow a standard template but there is an ad hoc component.
- 9 It is a preparatory contribution to the report by the Director-General that is called for in Paragraph G of Annex 3 of the Marrakesh Agreement and that aims to assist the TPRB to undertake an annual overview of developments in the international trading environment which are having an impact on the multilateral trading system. See WT/TPR/OV/W/1 to WT/TPR/OV/W/3 and WT/TPR/OV/1 to 13.
- 10 The second series started in late 2008 (the first report was distributed in January 2009) in the context of the recent global financial and economic crisis. See, for example, the Report on G20 trade and investment measures (May 2010 to October 2010) dated 4 November 2010.
- 11 In the context of the Fourth Appraisal of the TPRM, delegations indicated their desire to bring this matter to the attention of Ministers at the Eighth Ministerial Conference, and to prepare a Ministerial Decision aimed at the continuation and strengthening of the trade monitoring exercise under the TPRB. See Section VIII of WTO document WT/MIN(11)6 of 25 November 2011. The Appraisal was approved by all members.
- 12 Members sometimes request the WTO Secretariat to put concerns on the agenda but withdraw them before they are presented to the Committee, arguing that a bilateral arrangement has been found.
- 13 Documents G/SPS/GEN/204/Rev.11 and G/TBT/GEN/74/Rev.9 provide summaries of the specific trade concerns raised respectively in the SPS and the TBT committees.
- 14 The dataset and the methodology are available at http://www.wto.org/english/res_e/publications_e/wtr12_dataset_e.htm.
- 15 While this database is not public, the World Bank maintains a public database on WTO disputes. See Section C.1(b).
- 16 The disputes themselves are only a sub-set of all the conflicts that arise between members. In this perspective, Appellate Body cases can be seen as the tip of the "great pyramid" of the WTO legal order, with most of the important normative and conflict resolution work done much closer to the base of the pyramid (Wolfe, 2005).
- 17 Santana and Jackson (2012) have also reviewed and complemented a dataset of requests for consultations under the GATT dispute settlement covering the period 1948-1989. The original dataset was prepared by Reinhardt (1996) on the basis of Hudec (1993).
- 18 UNCTAD's collaboration with Asociación Latinoamericana de Integración (ALADI) stands out as its most successful attempt at engaging regional organizations in the collection of NTM information. Since 1997, ALADI has been collecting NTM information for a number of countries in the region and providing this information to UNCTAD on an annual basis. The data collected by ALADI is fully compatible with the UNCTAD TRAINS database. ALADI member countries are among the few for which the NTM information in TRAINS has been regularly updated over the period 1997 to 2010. See Section C.2.
- 19 Among the sources used were various government publications (official journals), publications from international organizations such as ESCAP's TISNET, WTO notifications, the German Foreign Trade Information Office (BFAI), the French International Trade Monitor (MOCI), the German Institute for Economic Research (IFO) or the British Business Journal.
- 20 For more details on this project, see United Nations Conference on Trade and Development (UNCTAD) (2010).
- 21 This international classification will be revised on a regular basis. The next update will be released in April 2012.
- 22 The seven pilot project countries were Brazil, Chile, India, Philippines, Thailand, Tunisia and Uganda.
- 23 The initial list of procedural obstacles can be found in Annex 3 of United Nations Conference on Trade and Development (UNCTAD) (2010).
- 24 By March 2012, data had been collected for about 40 countries and it had been disseminated for eight of them.
- 25 Accessible at: <http://go.worldbank.org/W5AGKE6DH0>.
- 26 See also the discussion of disputes as a source of information on NTMs in Section C.1.(a).
- 27 Moreover, it is not clear whether the PMR indicators take into account the enforcement of measures. However, Conway and Nicoletti (2006) argue that NMR indicators partly take into account the impact of policy enforcement.
- 28 This is not always true in the case of notifications. As discussed, there are reasons to believe that compliance with certain requirements may be low.
- 29 See Part II of United Nations Conference on Trade and Development (UNCTAD) (2010) for a discussion of quantification methodologies suited to survey data. One problem discussed in Appendix 1 of International Trade Centre (ITC) (2011) is that many countries lack a systematic business register covering all sectors, which makes random sampling in each sector difficult.

- 30 For an overview of business surveys, see Organisation for Economic Co-operation and Development (OECD) (2005). World Bank (2008a, 2008b) report the results of two recent World Bank initiatives to collect NTM data through interviews respectively in 13 mostly Asian countries and in East African countries, respectively.
- 31 Selected NTM survey countries include Burkina Faso, Egypt, Jamaica, Kenya, Madagascar, Mauritius, Morocco, Paraguay, Peru, Rwanda and Uruguay.
- 32 See the detailed description of ITC's NTM survey methodology, including the sampling technique in International Trade Centre (ITC) (2011).
- 33 Wolfe (2012) compares the GTA and WTO monitoring mechanisms.
- 34 As explained in Appendix C.1, the data available on UNCTAD TRAINS refer to the old NTM classification. There is no exact correspondence between the old and new classification. The use of data from UNCTAD TRAINS up to 2008 is made because it is the only source of official data that allows identifying trends.
- 35 Caution should be taken in interpreting these results, however, because of gaps in the data and also because part of the information comes from WTO notifications. The incentives to notify and compliance rates change over time.
- 36 Panel (b) of Figure C.2 has been constructed with the sub-set of Latin American countries with NTM information in 1999, 2001, 2003, 2004, 2005, 2006 and 2008. This comprehensive information was developed by ALADI and included in UNCTAD TRAINS. Note that the time periods slightly differ in the two panels because of data availability.
- 37 The average number of SPS notifications issued per member has fluctuated widely between 2005 and 2009, though in the prior years it has shown an increasing trend. For TBT notifications, the trend in the number of notifications per member somehow reverses, with wide fluctuations until 2005 and a marked increase since then.
- 38 The SPS STC Database includes information on the termination of each concern, which is provided by members in the context of the SPS Committee discussions. The data included in the figure are between 1995 and 2010. Sixteen new concerns were issued in 2011, but there is no information on the number of concerns resolved in 2011.
- 39 Unfortunately, with the information at hand, it is not possible to distinguish between these two channels. A third hypothesis is that there could be some substitution between the dispute-settlement mechanism and the specific trade concerns mechanism.
- 40 Because information on the date of resolution of TBT specific trade concerns is not available in the raw data, we make the following assumption in the construction of Figure C.6: we classify a TBT concern as "resolved" in year t if it is not raised again for two or more years after year t . For instance, if a specific trade concern is first raised in the TBT Committee in 1999, re-raised in 2000, and not re-raised in any following year, it is assumed to be "resolved" in 2000. As compared to SPS, the number of TBT concerns assumed to be "resolved" is therefore relatively high. This partly reflects the fact that a significant share of TBT concerns are raised on only one or two occasions, as a matter of clarification or further information. These concerns – for the purposes of this analysis – are assumed to be "resolved".
- 41 The results are essentially unchanged if trade values are expressed in real terms, deflating them with the US Consumer Price Index (CPI).
- 42 These results are statistically significant. The coefficient of a time trend in a regression with the coverage ratio (or the frequency index) as dependent variable is positive and significant at the 1 per cent level, both for SPS and for TBT concerns. The regressions include sector, country and country-sector fixed effects to control for unobserved sector-, country- and country-sector specific variables.
- 43 Subscripts c and t are omitted for expositional simplicity.
- 44 In fact, the measures computed from the two databases are not comparable; therefore, they are assigned different names.
- 45 The regressions in Box B.6 use instead the country, HS2 sector and time-specific indexes indicated in the equations.
- 46 Pre-shipment inspections, which under the previous classification were grouped together with TBT and SPS measures under the category of "technical measures", cover on average 20 per cent of products and of trade value.
- 47 Developed economies comprise the members of the European Union (27), Switzerland, Norway, the United States, Canada, Japan, Australia and New Zealand. Developing economies comprise all other countries, including the Commonwealth of Independent States (CIS). Country coverage depends on data availability.
- 48 This takes into account the fact that WTO membership includes many more developing than developed countries. It should be reminded that in the STC Database the European Union is considered a single developed country. As noted above, a "raising" country is the one which complains about a TBT/SPS measure imposed by a "maintaining" country in the relevant WTO Committee.
- 49 We run regressions of the coverage ratio or the frequency index on a dummy equal to one if the maintaining country belongs to the group of developed countries and zero otherwise. The coefficients on such dummy are positive and significant. The regression is at the two-digit level of disaggregation in the HS 1988-92 nomenclature, because this is the highest level of disaggregation at which frequency and coverage ratios can be calculated. Regression analysis is preferred in this context because it allows to control for omitted variables using fixed effects. In particular, the inclusion of sector-year fixed effects allows to control for unobserved heterogeneity within a sector over time. Country fixed effects cannot be included, due to collinearity with the variable of interest (developed country dummy). The results are available upon request.
- 50 An example is the Emerald Ash Borer, a beetle that was introduced into North America from Asia in the 1990s, and which has since devastated ash tree populations. The total discounted cost of the infestation to the United States alone is estimated at US\$ 10.7 billion by Kovacs et al. (2010).
- 51 As argued by United Nations Conference on Trade and Development (UNCTAD) (2012), the use of SPS measures is largely limited to agricultural sectors and products from animal origin because their control is essential for ensuring the health and well-being of consumers and the protection of the environment.
- 52 Twenty concerns (6 per cent) cover both agricultural and non-agricultural products. The results are quite similar when distinguishing between AOA and NAMA products. In this case, the results for SPS and TBT concerns are as follows. For SPS, 85 per cent of specific trade concerns are in AOA products and 7 per cent in NAMA products, with 8 per cent covering both. For TBT, 22 per cent of specific trade concerns are in AOA, 57 per cent in NAMA and 21 per cent in both.

- 53 We run regressions of the coverage ratio or the frequency index on a dummy equal to one if a specific trade concern affects any of the first 24 chapters of the Harmonized System (HS) trade nomenclature. The coefficient on such a dummy variable is positive and significant. The regressions include country-year fixed effects to control for unobserved heterogeneity within a (maintaining) country over time. Sector fixed effects cannot be included, due to collinearity with the variable of interest (agricultural sector dummy). The results are available upon request.
- 54 See Appendix Table C.1 in Appendix C.2. Intermediate intensity is measured as the share of HS6 products classified as parts and components in the total number of HS6 products belonging to a chapter (HS2).
- 55 The institutional implications of the theory of trade agreements under offshoring are analysed in detail in Section E.
- 56 Companies that could not be affiliated to a sector are excluded from this calculation.
- 57 Para-tariff measures comprise various taxes and charges other than tariffs and customs duties.
- 58 Refers to measures classified as "RED" in GTA reports, which clearly restrict trade.
- 59 See Hoekman (1996), Barth et al. (2006), Adlung and Roy (2009) and Gootiiz and Mattoo (2009a). Barth et al. (2006), for instance, show that, in the financial services sector, applied policy in a sample of 123 countries is much more liberal than what was committed to in the GATS.
- 60 This general trend of increased market contestability can be explained by the raising awareness that reforms that promote private corporate governance and competition (where these are viable) have the potential to boost economy-wide productivity growth (Nicoletti and Scarpetta, 2003). Moreover, stronger competition in product markets may also have a positive effect on employment. Wölfel et al. (2009) argue, however, that the aggregate trend masks wide differences in reform across countries and over time.
- 61 Figure C.21 (b) also includes the trends disaggregated by type of regulation, entry or conduct. It suggests that conduct regulations have decreased over time more markedly than entry regulations. Regression analysis confirms that the downward trend is statistically significant only for overall and conduct regulation, not for entry regulation. In the regressions, the NMR index is regressed on a time trend, including country-profession fixed effects. The coefficient on the time trend is negative and statistically significant. The results are available upon request.
- 62 Discriminatory (non-discriminatory) measures affect domestic and foreign services and services suppliers differently (equally).
- 63 Other questions used to compile the DPs indicator go beyond national treatment. For this reason, DPs is an imperfect proxy for discrimination in the sense of national treatment limitations (GATS Article XVII).
- 64 In particular, a regression of DP on a time trend and the full set of country fixed effects gives a negative and statistically significant coefficient. The sample includes however only 39 countries (mostly OECD members and some large developing countries such as Brazil, China and the Russian Federation, among others) for three years (1998, 2003 and 2008).
- 65 The overall index includes the following sectors (with equal weights): electricity distribution, wholesale trade, retail trade, transport, hotels and restaurants, media, telecommunications, banking, insurance, other finance and business services. The electricity, transport and communications index only includes (with equal weights) electricity distribution, transport (land and air, with respective sub-weights of one half) and telecommunications. The professional services index includes legal services, accounting and audit, architectural services and engineering services (always with equal weights).
- 66 See also United Nations Conference on Trade and Development (UNCTAD) (2006). This study classifies and scores FDI restrictions in services sectors for 50 developing and transition economies in 2004. It also finds considerable variation in FDI restrictiveness across countries. Moreover, it reports systematic differences across regions, with lower levels of restrictions in Latin America and European economies in transition (in 2004) compared with East Asia and the Middle East.
- 67 Specifically, the index is regressed on a time trend, with inclusion of country fixed effects to control for country-specific unobserved heterogeneity. The estimated coefficient on the time trend is negative and statistically significant. Results are available upon request.
- 68 In particular, a regression of LPS on a time trend and the full set of country fixed effects gives a negative and statistically significant coefficient. The results are available upon request.
- 69 The first survey included 117 countries in 1998-2000. The second included 152 countries in 2002-03. The last survey included 142 countries in 2005-07.

Appendix C.1: Data handling methodology in the UNCTAD's Trade Analysis Information System (TRAINS)

The “Historical Non-Tariff Measures” data used for this report were downloaded from the World Bank's World Integrated Trade Solution (WITS) database, using UNCTAD's Trade Analysis Information System (TRAINS). The data were only downloaded in the cases where the NTM classification was based on the old trade control measures (TCM) code (before 2009), since there is no exact correspondence between old and new TCM codes.

The data were downloaded for each country-year and include information about the nomenclature, the product code at the most disaggregated level (at the most detailed commodity level of the national tariffs – for some countries up to 12-digit codes), the start year, a partial coverage indicator, and the source. The countries were chosen on the condition that they reported two or more duty codes per year. Only the countries that had available information for at least two years were retained. These data were then matched with the description and the type of measure corresponding to each NTM code.

The data were then harmonized at the HS6 digit level,¹ using the following methodology. All product codes of less than six digits were expanded to include the six-digit codes belonging to the chapter or heading. The underlying assumption is that all products within an HS6 category are horizontally affected by a non-tariff measure if it is reported at lower levels of disaggregation (the correctness of this assumption has been verified with the compilers of the original data). In the cases where NTMs were reported at a level of disaggregation higher than HS6, it was assumed that the entire HS6 line was horizontally affected. For instance, for an NTM applied to HS8 product 51051015, the HS6 line 510510 was coded as affected. This procedure can potentially inflate the shares of products and trade affected by NTMs. To

obtain a sense of whether this was a real concern, we calculated incidence ratios – the number of product lines reported to be affected by NTMs over the total number of product lines belonging to that six-digit product code (downloaded from the Tariff Download Facility of the WTO). The partial coverage indicator could not be used for calculating the NTM incidence, since there were duplicate observations. Thus, this variable was not used.²

When using incidence ratios, D_i in the formulas for the share of trade and the share of lines affected is not a dummy variable, but an incidence ratio that can take values between zero and one. Results using incidence ratios are, however, not reported in this report because they are very similar to the ones obtained with D_i as a dummy variable (the correlation among the indices is as high as 0.98). Results are available upon request.

The next step was to obtain the information about which products were actually imported by the reporter countries, in the years for which the NTM was reported. Import data are from UN Comtrade, at the six-digit level, with the world as trade partner. For the European Union 1999, the trade data were not available directly; thus, the gross imports of the countries that belonged to it at that time were downloaded separately and summed up. Other data were not directly available when the nomenclature did not correspond with the years. For these, the available import data were downloaded in another nomenclature, and then matched to the actual nomenclatures via correspondence tables. The country-years handled in such a way were the Philippines (1998), Tunisia (1999) and the Bolivarian Republic of Venezuela (2003, 2004, and 2005).

Data availability

The country-year observations available are as follows:

Argentina	1999	2001	2003	2004	2005	2006	2008
Bolivia, Plurinational State of	1999	2001	2003	2004	2005	2006	
Brazil	1999	2001	2003	2004	2005	2006	
Chile	1999	2001	2003	2004	2005	2006	
Colombia	1999	2001	2003	2004	2005	2006	2008
Cuba			2003	2004	2005	2006	
Ecuador	1999	2001	2003	2004	2005	2006	2008
EU	1999						2007
Japan	1996	2001		2004			

Mexico	1999	2001	2003	2004	2005	2006	
Paraguay	1999	2001	2003	2004		2006	2008
Peru	1999	2001	2003	2004	2005	2006	2008
Philippines	1998	2001					
South Africa	1999					2006	
Thailand		2001	2003				
Tunisia	1999		2002				
Uruguay	1999	2001	2003	2004	2005	2006	2008
Venezuela, Bolivarian Republic of	1999	2001	2003	2004	2005	2006	2008
Viet Nam		2001		2004			

For the graphical representation of the descriptive statistics, the evolution is shown of the ratios, indices, and the counts over time by averaging the yearly observations into three periods. The reasons for this were the unbalanced panel, and the completely missing years 1997 and 2000.

Endnotes

- 1 The nomenclature was chosen in accordance with the reported year, as suggested by the compilers of the original data.
- 2 The same happened with duplicate observations whose only difference was in the variables start-year and start-month or sources. These variables were also dropped from the dataset.

Appendix C.2: Regression results

Appendix Table C.1: Coverage ratio and frequency index: intermediate-intensive sectors				
	SPS		TBT	
	Coverage ratio	Frequency index	Coverage ratio	Frequency index
	(1)	(2)	(3)	(4)
Intermediate intensity	-0.225*** (0.0434)	-0.0991*** (0.0207)	-0.00987** (0.00402)	-0.0300*** (0.00254)
Observations	3,808	3,614	11,760	10,715
R-squared	0.411	0.381	0.273	0.314

Notes: Country-year fixed effects included in all regressions.
Robust standard errors in parentheses. *** p<0.01, ** p<0.05.

D. The trade effects of non-tariff measures and services measures

This section discusses the trade effects of non-tariff measures and services measures in general before focusing on technical barriers to trade (TBT), sanitary and phytosanitary (SPS) measures and domestic regulation in services. It also examines whether regulatory harmonization and/or mutual recognition help to reduce the trade-hindering effects caused by the diversity of TBT/SPS measures and domestic regulation in services.

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Some key facts and findings

- The contribution of non-tariff measures to overall trade restrictiveness is significant, and in some estimates NTMs are far more trade restrictive than tariffs.
- TBT/SPS measures have positive trade effects for more technologically advanced sectors, but negative effects in agricultural sectors.
- There is evidence that TBT/SPS measures have a negative effect on export market diversification.
- The negative effects on trade caused by the diversity of TBT/SPS measures and domestic regulation in services are mitigated by the harmonization and mutual recognition of these measures.

This section examines the trade impact of non-tariff measures. Unlike tariffs, NTMs often vary across countries and sectors, so “ad valorem” equivalents are calculated for NTMs in order to make this comparison. Evidence is then presented on the trade effects of technical barriers to trade (TBT) and sanitary and phytosanitary (SPS) measures in goods and of equivalent domestic regulation measures in services.¹

The rationale for focusing on these measures is that, independent of their policy objectives, economic theory offers a mixed picture – both negative and positive – of how these measures affect the volume and direction of trade. For example, standards and technical regulations can raise producer costs – because compliance is more expensive – but reduce consumer costs – because product quality information is more readily available. Trade will increase or fall depending on whether the positive effect on demand is greater than the negative effect on supply.

In order to highlight the differences between non-tariff measures and tariffs, this section also attempts to disentangle the trade effects of these measures by focusing on: (a) the specific channel through which trade is affected (the volume of trade or the decision to export); (b) their specific impact across countries, sectors and firms; and (c) whether the measure itself, or the way it is applied, constitutes the main restriction to trade. This section also considers the degree to which the harmonization or mutual recognition of TBT/SPS measures and domestic regulation in services helps to reduce any trade-inhibiting effects.

1. Estimating the trade effects of NTMs and services measures

A number of studies attempt to quantify the effect of non-tariff measures on international trade. Averaging across countries, they find that NTMs are almost twice as trade restrictive as tariffs. They also find that, in several countries, NTMs actually contribute much more than tariffs to the overall level of trade restrictiveness. These results, however, are based on NTMs data which have not been updated for about ten years. Given the decline in tariff rates since then, the relative contribution of NTMs to overall trade restrictiveness is likely to have increased, perhaps making them even more important than tariffs in most countries.

Furthermore, evidence suggests that the relative contribution of non-tariff measures to the overall level of protection increases with the level of GDP per capita. The trade literature also finds that NTMs in agriculture appear to be more restrictive and widespread than those in the manufacturing sector. In the case of services, while restrictions to trade are generally higher in developing countries than in OECD countries, they do not appear to be systematically associated with a country’s level of development. The cross-country

pattern of restrictiveness of services measures varies across services sectors. It is worth noting that the methods developed in the literature to estimate these trade effects suffer from a number of limitations which can be traced, in part, to a lack of transparency in the use of NTMs. In addition, they do not address the potential impact of global supply chains.

(a) Magnitude of NTMs as restrictions to trade

Earlier sections of the Report have highlighted that non-tariff measures can take many different forms – quotas, taxes, subsidies, technical regulations etc. In order to facilitate a comparison between the trade effects of these different NTMs, studies analyse the impact of NTMs on international trade by estimating an “ad-valorem tariff equivalent (AVE)”, i.e. the level of an ad-valorem tariff that would have an equally trade-restricting effect as the NTM in question. This enables a comparison to be made with tariffs, and is important for any analysis of the welfare implications of various trade policy measures. In the trade literature, the AVE of different NTMs is computed using one of two approaches – the “price gap” or the “econometrics-based method” (See Box D.1).

(i) *Do NTMs matter?*

Using data for 91 countries, Kee et al. (2009) evaluate the trade impact of non-tariff measures econometrically for each of 4,575 six-digit categories of the Harmonized System (HS) of classifying goods where at least one country imposes what they categorize as either a “core NTM” (defined as including price control measures, quantitative restrictions, monopolistic measures, anti-dumping and countervailing measures and technical regulations) or “agricultural domestic support”.²

They estimate the average AVE of core NTMs for the entire sample at 12 per cent. When weighted by imports, this number falls to 10 per cent. The numbers are much higher – 45 per cent and 32 per cent respectively – if the averages are calculated only for tariff lines affected by core NTMs.³ In contrast, the simple and import-weighted averages of AVEs of agricultural domestic support are much smaller (generally below 1 per cent). According to the authors, this is because a small number of products are affected by agricultural domestic support in most countries. The importance of NTMs is reinforced by available firm survey evidence. For example, a recent survey on non-tariff trade costs between Arab countries revealed an average AVE of 6 per cent (Hoekman and Zarrouk, 2009).

Estimates of the trade impact of non-tariff measures are largely consistent with the AVEs computed. Hoekman and Nicita (2011) find that reducing the AVE of NTMs by half, from around 10 per cent to 5 per cent, would

Box D.1: Methodology used for estimating the AVE of NTMs

Price gap method

Non-tariff measures increase the price paid by consumers.⁴ The basic strategy of the “price gap” method involves a comparison of prices before and after the NTM mark-up, where this difference is expressed as a tariff equivalent. Making this comparison, however, is not straightforward. Many factors unrelated to NTMs also affect costs and prices at different points in the supply chain. For instance, the “free-on-board” (f.o.b.) price at the point of export includes the cost of transport to the point of export as well as the costs of loading the goods, while the “cost-insurance-freight” (c.i.f.) price also includes the cost of international transport and insurance. Furthermore, the price after border procedures includes any tariffs charged on the product. Finally, wholesale and retail prices include internal transport costs and distribution margins. These factors must be removed from the observed price difference before the mark-up can be attributed to non-tariff measures (Ferrantino, 2006).

However, different NTMs occur at different points in the supply chain, which means that the price impact of a particular NTM can only be identified by comparing two prices at the relevant stages in the production and distribution process. For example, customs procedures affect the difference between the c.i.f. price and the landed duty-paid price. In sum, it is possible but not straightforward to measure and compare the restrictiveness of different types of NTMs (Ferrantino, 2012).

Econometrics-based method

An alternative to the direct “price gap” method described above is to estimate the impact of non-tariff measures on either price or quantity (trade flows) using econometric models. Estimating the “quantity impact” is particularly useful because data on trade flows are more easily available at a disaggregated level. Moreover, when the NTM is absolutely prohibitive, no prices are observed, or when the product is highly differentiated, prices are not particularly informative (Ferrantino, 2012).

In much of the trade literature, the AVEs of non-tariff measures are estimated through “gravity equations”. These are econometric models of trade which acquire their name from the similarities to Newton’s theory of gravitation. They predict that the value of trade between any two countries will be positively related to the size of their economies and inversely related to the distance (and other measures of trade costs) between them. In order to estimate the effect of policies such as tariffs and NTMs on trade, gravity equations include measures, which capture these policy factors, as explanatory variables.

$$\ln(\text{VALUE OF IMPORTS}) = a + b_1 \ln(1 + \text{TARIFF}) + b_2 \text{NTM} + cX$$

where “X” is a set of variables that may also affect trade flows. It typically includes GDP, distance and other trade costs. When precise data are lacking, the presence of NTMs is captured by a dummy variable, which assumes a value of one when the NTM in question applies and zero otherwise.

The gravity model of trade enables an estimation of the predicted value of trade between a country pair with and without the non-tariff measures. The effect of the NTM on trade is estimated as the difference between the two values. A similar calculation can be made for the effect of a tariff compared with no tariff. The AVE of the NTM can then be derived by comparing these two predicted differences. More specifically, the AVE of the NTM is a tariff that has the same effect on the value of trade.

The trade literature refers to the above as the “direct approach”. There is also an “indirect approach” which compares actual trade flows to the trade flows predicted by a hypothetical frictionless benchmark scenario. The deviation of actual from predicted trade flows is taken to be indicative of the impact of NTMs because specific explanatory variables measuring NTMs are not included in the estimated equation. This “indirect approach” is particularly useful if direct measures of trade restrictions are sparse or imprecise, as is often the case for NTMs (Chen and Novy, 2012).

increase trade by 2 to 3 per cent. The role of NTMs in reducing trade is further highlighted by the following examples cited in Andriamananjara et al. (2004). For the apparel sector, prices in the United States, the European Union and Canada were 15 per cent, 66 per cent and 25 per cent higher, respectively, due to the presence of

NTMs. In South-East Asia, South Asia and Japan, paper products were 67 per cent, 119 per cent and 199 per cent more expensive respectively due to NTMs, while NTMs on leather shoes raised their prices in Japan by 39 per cent and in Mexico/Central America by 80 per cent.

In the agricultural sector, non-tariff measures on vegetable oils and fats increased their prices in Mexico by 30 per cent, in South East Asia by 49 per cent and in South Africa by 90 per cent, according to Andriamananjara et al. (2004). Analysing bilateral industry-specific trade flows for countries in the European Union, Chen and Novy (2011) find that among the different NTMs, TBT measures are the most important factor. An analysis of the trade effects of TBT/SPS measures, in particular, is presented in Section D.2.

The results described above highlight the importance of non-tariff measures in an absolute sense. But what do the data reveal about the significance of NTMs in restricting trade relative to tariffs? Kee et al. (2009) find that for 55 per cent of tariff lines in their sample subject to core NTMs, the AVE of these core NTMs is higher than the tariff. Similarly, in 36 per cent of tariff lines subject to domestic agricultural support, the AVE of domestic agricultural support is higher than the tariff. Furthermore, aggregating core NTMs and domestic agricultural support across all tariff lines under consideration in an overall trade restrictiveness index, Kee et al. (2009) find that NTMs – averaging across countries – almost double the level of trade restrictiveness imposed by tariffs. In fact, in about half of the countries in the sample, the contribution of NTMs to the overall level of trade restrictiveness is much higher than the contribution of tariffs.

Using two indices of trade restrictiveness that estimate how trade policies affect a country's imports – the tariff trade restrictiveness index (TTRI) and the overall trade restrictiveness index (OTRI), where the latter includes the effect of both tariffs and non-tariff measures – Hoekman and Nicita (2011) find that, averaging across countries, a 10 per cent reduction in the TTRI increases trade volumes by a little more than 2 per cent, while the removal of NTMs increases trade by an additional 1.8 per cent.⁵ This discussion illustrates that NTMs are an important restriction on trade, even more important than tariffs in several countries. Measuring restrictiveness faced by exporters in all destination markets, Hoekman and Nicita (2008) compare the market access versions of the TTRI and the OTRI to show that the AVE of NTMs is generally much higher than existing tariffs.⁶

In a recent report, UNCTAD (2012) argues that non-tariff measures contribute much more than tariffs to overall trade restrictiveness. In particular, it finds that NTMs contribute more than twice as much as tariffs to overall market access trade restrictiveness.⁷ This result must be viewed with caution because unlike the studies described above (which compare NTMs and tariff data in 2001), the UNCTAD report compares 2001 NTM data with 2010 tariff data – a period over which tariffs have fallen. Hence, the contribution of NTMs to overall trade restrictiveness is likely to have increased, assuming that NTMs did not decline during

the same period and that the trade-restricting impact of NTMs did not fall by more than that of tariffs.

In fact, using product-level analysis, a study by Henn and McDonald (2011) finds that while trade flows fell by 5 per cent as a result of border measures, such as tariffs, implemented during the recent financial crisis, they fell by 7 per cent as a result of behind-the-border measures (i.e. non-tariff measures). Even within the category of border measures, the authors find that tariffs and other traditional trade policy measures have had a relatively small impact on trade flows, whereas NTMs such as anti-dumping duties have had a substantial effect.

(ii) NTMs: variation across countries and sectors

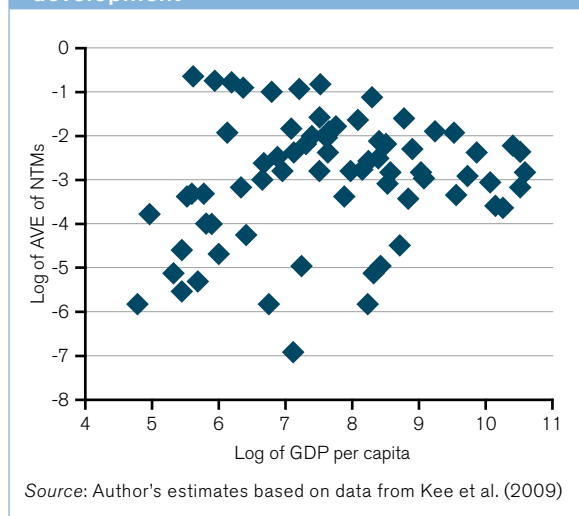
Kee et al. (2009) find that the variation in the AVEs of non-tariff measures across countries is large. For example, the simple average AVE of core NTMs varies from almost 0 to 51 per cent, and from 0 to 39 per cent when import-weighted. The AVEs for domestic support are generally below 1 per cent. The countries with the highest average AVE of core NTMs are all low-income African countries, including Algeria, Côte d'Ivoire, Morocco, Nigeria, Tanzania, and Sudan. Several middle-income countries, such as Brazil, Malaysia, Mexico and Uruguay, also have relatively high AVEs of core NTMs.⁸ The countries with the highest AVEs of agricultural domestic support are EU members.⁹

According to Kee et al. (2009), when considering both core non-tariff measures and agricultural domestic support, the AVEs of NTMs increases with GDP per capita, although some middle-income countries seem to have the highest AVEs of NTMs. However, Figure D.1 shows that there is no discernible relationship between the AVE of NTMs and the level of GDP per capita across countries. This is confirmed by regression analysis which shows that the association between the AVE of NTMs and the level of GDP per capita is not statistically significantly different from zero.¹⁰

At the same time, Hoekman and Nicita (2008) find that tariffs are negatively associated with a country's level of income per capita. This evidence, combined with the result in Figure D.1, suggests that the contribution of NTMs to the overall level of protection is likely to increase with the level of GDP per capita, i.e. as countries become richer, the trade restrictiveness of NTMs relative to tariffs increases. The findings of UNCTAD (2012), which show that NTMs are relatively more restrictive in high- and middle-income countries support this interpretation.

The work by Kee et al. (2009) also reports significant variation in the AVEs of non-tariff measures across tariff lines, amounting to an average level of 27 per cent for agricultural products compared with 10 per cent for

Figure D.1: AVEs of NTMs and economic development



manufactured goods. The greater trade-restricting impact of NTMs for agricultural goods relative to manufactured products is reinforced by the results of Hoekman and Nicita (2008). They also show that the restrictiveness of NTMs for agricultural trade is especially important in developed economies.

However, using data for 2001 to estimate the trade effect of non-tariff measures on prices directly in an econometric model, Andriamananjara et al. (2004) find almost no statistically significant impact for the agricultural sector.¹¹ The authors explain that this may be attributable to the definition of NTMs used in the study, which includes import quotas, prohibitions, non-automatic licensing, voluntary export restraints, environmental standards and SPS measures, but excludes tariff-rate quotas. The latter are likely to be the economically binding constraints on agricultural trade.¹²

Andriamananjara et al. (2004) identify apparel as the sector with the largest number of significant NTMs. They estimate a simple average AVE of NTMs of 73 per cent across countries. The corresponding estimate in Kee et al. (2009) is 39 per cent. The higher order of magnitude in Andriamananjara et al. (2004) may be explained by the fact that they exclude products for which they found a very small impact of NTMs on imports or domestic prices. Andriamananjara et al. (2004) identify paper products, leather products, and vegetable oils and fats as other sectors with multiple significant NTMs.

(b) Methodological limitations: A problem of transparency

The previous section outlined the existing empirical literature which quantifies the impact of non-tariff measures on trade by estimating an ad-valorem equivalent. It should be noted that the use of AVEs – and

the choice to model the effects of NTMs as a negative tax for subsidies, and as a tariff for trade-restricting NTMs – can be misleading at times. For example, the equivalence between tariffs and quotas breaks down in the presence of market uncertainty. Furthermore, the AVE of NTMs does not capture any relevant fixed costs, such as those associated with meeting certain technical regulations. Beyond these limitations, quantification is a challenging exercise. The methods developed in the literature suffer from a number of limitations.

(i) Price gap method

A comparison of two prices to infer the trade effect of a non-tariff measure is indicative of the lack of transparency associated with the use of NTMs. Unfortunately, given insufficient data on different prices, even the estimation of a price gap is far from straightforward.

The appropriate prices to compare when measuring the price gap attributable to most non-tariff measures are the invoice (c.i.f.) price of the imported good and the price of the domestic alternative (Deardorff and Stern, 1998). However, in reality, the observable domestic price of a good typically does not distinguish between domestic products and imports. It means that the actual comparison is between the invoice (c.i.f.) price and the price of the good in the domestic market, whether produced at home or imported. This is problematic for two reasons.

First, at a certain level of aggregation, goods that are imported into a country are seldom identical to “like” goods produced domestically. The two may be poor substitutes for each other – for example, because of quality differences. Secondly, even if the domestic and imported good are perfect substitutes, the price gap may be suppressed to the extent that the imports of the same good from other countries are subject to a non-tariff measure.

An additional issue relates to the choice of domestic prices to use in computing the price gap. Many studies use retail price data simply because they are easier to observe than prices at other stages of the supply chain. Retail price data contain transport, wholesale and retail margins. Although these can potentially be separated out, they introduce considerable uncertainty in the identification of the NTM mark-up.¹³ It is also difficult to net out the price increase due to consumers' willingness to pay for higher quality.

Furthermore, once a price gap is calculated for a particular good in a particular market, it provides a single measure of the trade effect of non-tariff measures. So when there is a single, transparent NTM, the tariff equivalent reflects the effect of that policy. However, in the case of multiple NTMs, the single price gap or tariff equivalent reflects the cumulative effects of all NTMs that are present in the market. This makes

it difficult to ascertain the percentage of the price increase that is attributable to each of the separate NTMs. It may be that there is one NTM which, when removed, eliminates most of the distortion. If so, the price gap would largely reflect the effect of this particular NTM.

Conversely, it may also be true that the removal of a non-tariff measure does not permit market access. In this case, the “true” tariff equivalent of a single policy change may in fact be zero even when the measured tariff equivalent of all NTMs jointly may be quite large (Ferrantino, 2012). Finally, the price gap method is only suitable for analysing NTMs of a single importing country for a few products of particular interest. The data requirements to address NTMs across multiple countries and products can be unmanageable.

(ii) Econometrics-based method

A notable advantage of econometric analysis, relative to the “price gap” method, is that it can be used to study the trade effects of multiple non-tariff measures across multiple industries and countries simultaneously. In addition, the relative abundance of data on trade flows makes it particularly attractive for analytical purposes. However, the econometrics-based methods have certain shortcomings as well.

First, given the lack of transparency, observing non-tariff measures precisely is difficult. Hence, a dummy variable which equals one if the measure is present is unlikely to capture several NTMs. Using the difference between actual and predicted imports as a measure of NTMs is also problematic because it may capture factors other than trade policies.

Secondly, like the “price gap” method, this approach cannot disentangle the individual effects of a single non-tariff measure when multiple NTMs are present in a market. In many cases, however, only one NTM – or a small number of NTMs – is applied to any given good. Cross-country variation in the application of NTMs can then potentially be used to disentangle their trade effects (Carrère and De Melo, 2009). Thirdly, the results obtained are likely to be sensitive to the details of the econometric techniques used.

(iii) Global supply chains

The measurement exercises discussed in the previous sub-section do not explicitly address the advent of international production networks. They assume a linear supply chain in which a single good is moved from place to place without being transformed. However, with the location of different stages of production in different countries, it takes many more cross-border transactions to provide a single unit of a final good than before. This is particularly true for manufactured goods with multiple components, such as electronics and motor vehicles.

Consider the global supply chain of producing a computer disk drive as discussed in Hiratsuka (2005) and Baldwin (2008). The disk drive is assembled in Thailand, which acts as the hub of the supply network, using 43 components from ten other countries in addition to 11 components produced in Thailand. Hence, there are at least ten moves across international borders, and perhaps more, depending on the extent to which shipments can be bundled. Furthermore, since the disk drive will be shipped to the location of final computer assembly (e.g. China), where the other major computer components are gathered, the number of cross-border moves multiplies even further.

Importantly, in a global supply chain that requires semi-finished goods to move back and forth across international borders more than once, the effects of non-tariff measures (and other trade costs) are compounded. This implies that the effect of a marginal increase in trade costs is much larger than would be the case if there were a single international transaction. Box D.2 illustrates this argument with a numerical example. In addition, the price increase at each step would include not only the monetary costs of moving along the supply chain, but the costs associated with the waiting time as well (Ferrantino, 2012).

(c) Services measures

The methodology employed to assess the trade impact of services measures follows that used in goods. In addition, the trade literature also develops an approach based on the construction of Services Trade Restrictiveness Indices (STRIs).¹⁴ A number of studies use these indices to estimate the price effects of services measures (controlling for all relevant industry and economy-wide determinants of economic performance of firms) for several services sectors across a large sample of countries (McGuire, 2008; Francois and Hoekman, 2010).

(i) Empirical estimates

For a sample of 78 countries across four services sectors, Walsh (2006) finds an average tariff equivalent of 72 per cent for services measures.¹⁵ Analysing data for 11 services sectors¹⁶ across 63 countries, Guillin (2011) finds a much lower average tariff equivalent of around 40 per cent. A comparison of these estimates, however, is not very meaningful because different studies use different data samples and different parameters in the econometric specification.

In general, it appears that restrictions to services trade are higher in developing countries than in OECD countries (Walsh, 2006; Francois et al., 2003; Fontagné et al., 2010). At the same time, trade restrictions in services do not appear to be systematically associated with a country’s level of development. For example, the work of the Australian Productivity Commission shows that some OECD

Box D.2: Cumulation of trade costs in a global supply chain

Suppose that the total value-added necessary to produce a product is equal to one. The product is produced in stages in “ n ” countries, each of which adds $(1/n)$ to the total value of the product. After production, the product is exported to a final destination, so that it is moved “ n ” times altogether. Let the cost of a non-tariff measure on moving the product from one country to another equal “ t ” on an ad-valorem basis. Hence, at each stage, the cost “ t ” is charged on the entire value of the product produced up to that point, including previous trade costs. The total cost of the product (produced in n stages) when delivered to the final consumer is represented by $c(n)$, so that:

$$\begin{aligned} c(1) &= (1 + t) \\ c(2) &= \left(\frac{1}{2}\right) (1 + t)^2 + \left(\frac{1}{2}\right) (1 + t) \\ c(3) &= \left(\frac{1}{3}\right) (1 + t)^3 + \left(\frac{1}{3}\right) (1 + t)^2 + \left(\frac{1}{3}\right) (1 + t) \\ c(n) &= \sum_{i=1}^n \frac{1}{n} (1 + t)^i \end{aligned}$$

Suppose that the AVE of an NTM at each stage is 10 per cent, i.e. “ t ” = 0.1 and $c(1) = 1.1$. As the global supply chain is fragmented further, trade costs compound fairly quickly: $c(5) = 1.343$ (an AVE of 34.3 per cent) and $c(10) = 1.753$ (an AVE of 75.3 per cent). Moreover, marginal increases in trade costs are compounded. For instance, if the AVE of NTMs “ t ” increases from 0.1 to 0.2, a doubling at each stage of the supply chain, trade costs along the supply chain more than double, with more compounding for more fragmented supply chains: $c(5) = 1.786$ and $c(10) = 3.115$.

countries have restrictions comparable with the averages prevailing in major developing economies.

Furthermore, Gootiz and Mattoo (2009b) find that although high-income countries are quite open overall, there is much more variation in the restrictiveness of services trade in developing countries. The authors show that some low-income countries in Asia and Africa are relatively open. So too are some middle-income countries in Latin America, Africa and Eastern Europe. In contrast, some of the most restrictive services measures are found in the fast-growing economies of Asia as well as in the Middle East. Other studies also find the emerging economies in Asia to have relatively protectionist services measures (Walsh, 2006; Park, 2002; McGuire, 2008).

It appears that variations in the restrictiveness of services measures across countries may depend on the particular sector under consideration. For instance, Indonesia’s tariff equivalent in business services appears to be lower than that in more developed countries, such as Japan and the Republic of Korea, but higher in construction services (Park, 2002; Guillin, 2011). Similarly, analysing members of Asia Pacific Economic Cooperation (APEC) in 1997, McGuire (2008) found that while the United States was among the least restricted markets in telecommunications services, it was among the most highly restricted in maritime services. At the same time, middle-income economies in South America were found to have relatively high restrictiveness index scores for financial services, but were among the least restricted markets in distribution, telecommunications and professional services.

According to a set of studies, averaging across countries, transport and business services appear to be the most open sectors, with an average tariff equivalent of 21 per cent and 28 per cent respectively for services measures. The most protected is construction services, with an average tariff equivalent of 58 per cent (Park, 2002; Fontagné et al., 2010; Guillin, 2011). In a different study, however, foreign direct investment (an important mode of trade in services) in transport services is among the most restricted, while that in construction services is the least restricted (UNCTAD, 2006). The contradictory results suggest that the accuracy and reliability of the aforementioned estimates of the restrictiveness of services measures may be questionable. This lack of precision and consistency may be attributable to a number of methodological limitations.

(ii) Methodological limitations

In analysing the trade-restricting effect of services measures, an estimated AVE must take into account the possible substitution between different modes of supply when one particular mode is affected. For instance, there may be a switch from mode 3 trade (a foreign company setting up subsidiaries or branches to provide services in another country) to mode 2 trade (consumers or firms making use of a service in another country) in higher education services as a result of restrictive services measures affecting the former (Dee, 2010). Such intermodal substitution is likely in the case of insurance services as well (from mode 3 to mode 1, services supplied from one country to another).

In order to derive a meaningful AVE, other policy interventions that affect the trade-restricting impact of

a services measure also need to be taken into account. For example, in the case of international air services, firms may respond to ownership limits imposed by the withholding clauses in air services agreements (affecting mode 3 trade) by negotiating code-sharing arrangements. Moreover, if mode 3 is the predominant mode of trade (as it is for telecommunications, for example), high fixed costs of market entry/establishment would not even be captured by the concept of a “tariff equivalent”.

In addition, the methodological limitations associated with analysing the trade effects of non-tariff measures are also applicable to services measures. For example, given the lack of transparency, it is difficult to observe precisely different services measures. Attributing the difference between actual and predicted imports (derived from an econometric estimation) to the impact of services measures highlights this problem. Furthermore, there may be multiple restraints on trade in services, and it may not be clear which are

economically binding and which are not. Representing these NTMs as an AVE can thus be misleading for this reason as well. The use of subjective criteria to weigh the relative importance of diverse measures when constructing STRIs also illustrates the methodological difficulties involved in estimating the price effects of services measures.

Finally, AVEs of services measures calculated using services trade flows do not take into account the indirect effects that these measures have on trade in goods. Such effects are likely to be strong because of the complementarities between goods and services (see Box D.3). For example, a services measure that restricts trade and competition in transport and logistics services has a negative impact on merchandise trade. However, this is not taken into consideration when AVEs of services measures are calculated using services trade flows only. The role that services trade plays in global supply chains makes this an important problem (see Section B.3).¹⁷

Box D.3: Complementarities between trade in services and trade in goods

Evidence suggests that export competitiveness in manufacturing sectors, such as machinery, motor vehicles, chemicals and electric equipment, is positively associated with inward foreign direct investment and imports of business services (Francois and Woerz, 2008) and negatively affected by regulations that hinder such trade (Nordås, 2010). Such complementarity between trade in services and trade in goods may be explained by various mechanisms.

A first mechanism is constituted by transport and logistics links. Transport and travel services account for about half of cross-border trade in services and are the most important direct services input to international trade in goods. For instance, Yeung et al. (2012) find that Chinese manufacturing firms that make use of third-party logistics suppliers (largely from Hong Kong, China) tend to perform better in export markets than firms that do logistics in-house or purchase them locally. Evidence also suggests that measures that restrict trade and competition in transport and logistics services have a negative impact on merchandise trade performance. Market power in the shipping industry, for example, raises trade costs, particularly for developing countries (Hummels et al., 2009).

Secondly, goods and services are often bundled in final markets. After-sales services, for instance, are important for a host of durable goods such as cars. Aviation engines, printers, vending machines, and other equipment are also increasingly rented or leased with a services contract. Another recent trend is to consider goods mainly as a services platform. Mobile telephones, for instance, are often sold for a nominal amount on the condition that customers sign up for a fixed-period service contract. When goods and services are complementary or bundled, services measures strongly affect the traded good in question as well (Lodefalk, 2010). Evidence suggests that manufacturing firms in Sweden and the United Kingdom (and also mining and oil companies in the United Kingdom) are vigorous traders in services, and that the services share of their total revenue has increased over time (Lodefalk, 2010; Breinlich and Criscuolo, 2011).

Thirdly, the complementarity between trade in goods and trade in services is increased further by the role of intermediaries (retailers and wholesalers) in international trade.¹⁸ Bernard et al. (2010) find that 35 per cent of US exporters are wholesalers, accounting for 10 per cent of the value of US exports. Similarly, more than 25 per cent of Italian exporters are intermediaries, accounting for 10 per cent of the value of Italian exports.¹⁹ Intermediaries, such as leading multinational retailers tend to source their products directly from manufacturers or farmers, and typically have a centralized sourcing unit servicing all sales outlets, globally or regionally. Hence, they tend to contribute to increased trade in consumer goods between their home country and the host countries of their affiliates.²⁰

Market concentration in a sector comprising intermediaries may also affect merchandise trade. For example, in the event of trade opening, retailers with significant market power may fail to pass reduced trade costs on to consumers (Francois and Wooton, 2010). At the same time, regulatory heterogeneity (such as differences in product standards, labelling and recycling requirements) may impose considerable costs on retailers by requiring them to modify products for each destination.²¹

2. Disentangling trade effects of TBT/SPS measures and domestic regulation in services

This section focuses on TBT/SPS measures and equivalent domestic regulation in services, and reviews what we know about their effects on trade flows. One reason to focus on this sub-set of measures is that economic theory does not provide simple predictions as to their trade effects. Assessing their effects is therefore an empirical issue. In contrast, economic theory provides clear guidance as to the trade effects of other non-tariff measures – for example, import quotas reduce imports, export duties reduce exports, while export subsidies increase exports.

Another specific characteristic of these measures is that they are commonly regarded as having an important fixed-cost component, which significantly differentiates them from tariffs. For example, to adapt a product to new technical requirements may require an initial investment independent of the level of exports. The presence of a fixed cost to enter a market may, however, have effects on trade that are different from a tariff, and this aspect deserves attention.

In particular, this sub-section examines how TBT/SPS measures and domestic regulation in services affect the volume of trade and the decisions about whether to export to a certain market. This sub-section also considers whether these measures affect developing and developed countries differently and whether these effects differ by sector and firm. Where possible, the impact of these measures on trade in industries where the production process is fragmented is highlighted. Finally, an attempt is made to distinguish between the impact of the measures themselves and the impact of the way in which measures are implemented.

Economic theory and associated empirical research, in general, do not distinguish between mandatory and non-mandatory TBT/SPS measures, and the term standard is often used to denote both. In the absence of a theoretical prediction as to a different impact of a mandatory versus a non-mandatory measure – even when using databases that cover only non-mandatory standards or only mandatory ones – the results are interpreted more generally as the impact of TBT/SPS measures.

Empirical economic literature clearly distinguishes, however, between national or country-specific standards (standards that are different from those in another country) and shared standards (standards that are identical or equivalent between two countries, including international and regional standards). The distinction is made to disentangle the impact on trade of harmonization of TBT/SPS measures. The review of the literature in this section follows this approach.

As far as services are concerned, the economic literature generally looks at overall indexes of the restrictiveness of domestic regulation – and includes measures that go beyond the focus of this report. The following review of the relevant studies mainly highlights an important gap in the existing empirical literature.

(a) Overall effect on trade

When exploring the effects of TBT/SPS measures on trade, one would ideally like empirical evidence to distinguish among different types of measures. This is because TBT/SPS measures affect trade through different channels.

For example, the introduction of product safety regulation will increase production costs but can also serve as an important quality signal, thereby helping to promote the competitiveness of those products that meet stringent standards. Product safety regulations also increase trust in the quality of foreign products, thus reducing transaction costs and fostering trade. Whether these effects will translate into higher imports or export depends on the effect of the measure on the relative costs of domestic and foreign products, and on the willingness of consumers to pay higher prices for safer products.

As a further example, consider the case of compatibility standards. In network industries, where the value of a product increases with the number of consumers and complementary goods, compatibility standards are likely to increase trade. Without such standards, these markets may oversupply varieties and the network sizes may remain too small. Standards in these markets are generally voluntary and can help consumers acquire information about preferences abroad, and help producers to coordinate their activities more efficiently. This general prediction needs to be qualified, however, since compatibility standards can also reflect anti-competitive behaviour.

Except for environmental and food safety regulation, the existing trade literature does not distinguish among different types of measures (for example, whether they address a safety or compatibility concern, or whether they define the characteristics of a product or a testing procedure). Rather, the literature has tended to rely on an index of standardization activities – usually the number of standards or the number of technical measures maintained by a country. The focus has then been on the relationship between this broad measure of TBT/SPS measures and trade flows, or on the cost-raising impact of these measures.

Notwithstanding these limitations, the existing empirical literature finds that, at the aggregate level, TBT/SPS measures may not be associated with lower trade. For example, in a pioneer study on the relationship between standards and aggregate trade

performance, Swann et al. (1996) found that standards promoted trade. They estimated that a 10 per cent increase in the number of country-specific standards (as opposed to “shared” standards)²² increased UK imports from the rest of the world by 3.3 per cent and exports by 2.3 per cent. With a different specification of the model, but the same dataset, Temple and Urga (1997) found an insignificant effect of standards on trade. Although their findings differed, both studies challenged the predominant view that national standards restrict trade.

Literature that looks at licensing and qualification requirements and procedures and technical standards in services is very limited. It would appear that the only study that attempts to measure the effects of such domestic regulation is Kox and Nordås (2007). In the first part of their study, the authors use a reconstructed Product Market Regulation (PMR) index²³ based on the selected indicators that in their view “come closest to covering the types of regulation mentioned in [General Agreement on Trade in Services] Article VI.4”, that is, domestic regulation as defined in this report. While the estimated trade effect of this reconstructed PMR on overall services trade (covering modes 1 and 2 and mode 4, individuals travelling from their own country to supply services in another) is negative, the estimated coefficient on “licences and permits system” (that is mostly closely related to domestic regulation as of GATS Article VI.4) is positive, though small.

In other words, burdensome licensing procedures are found to increase services trade. One possible explanation is that restrictive licensing procedures induce intermodal substitution between export and foreign direct investment (FDI). The finding that the stringency of the “licences and permits system” indicator reduces inward and outward FDI supports this view. In the second part of the study, Kox and Nordås (2007) use banking regulatory indexes developed by the World Bank (Barth et al., 2008). They show that regulation aiming at ensuring appropriate standards (such as accounting standards and financial statement transparency) is positively associated with cross-border trade and FDI in financial services.²⁴

(b) Differences across sectors and countries

Studies based on disaggregated trade data show that the effect of TBT/SPS measures depends on the type of sector. One of these studies is by Moenius (2004). Using a gravity model²⁵ to assess the impact of national standards on trade for a dataset covering 471 sectors at the four-digit Standard International Trade classification (SITC) level and bilateral trade for 12 developed countries, he finds that import-specific standards have a negative impact on imports in the non-manufacturing sectors (namely, food, beverages, crude materials and mineral fuels), but

have a positive impact on imports in the manufacturing sector (including oils, chemicals, manufacturing and machinery).

Moenius's interpretation of the results is that standards, by providing exporters with valuable information about market preferences, reduce transaction costs even if they impose adaptation costs. In more differentiated sectors, such as certain manufacturing sectors (for example, high-technology sectors), information costs may be higher. Therefore, information costs' reducing effect outweigh adaptation costs' increasing effect and trade increases.

Moenius's (2004) conclusions are supported by several studies. For example, Blind (2001) finds a positive and significant effect of standards on trade in “instruments for measurement and testing”, as does Moenius (2006) for “electrical products”. Using information on the measures notified under the SPS and TBT agreements, Disdier et al. (2008b) find an overall negative impact of SPS and TBT measures on trade in agricultural products.

Focusing on notified TBT/SPS environment-related measures (ERM) (see Box D.4), Fontagné et al. (2005) also tend to find a positive effect of ERM on manufacturing trade, but a negative effect on trade in fresh and processed food. More recently, Li and Beghin (2012) perform an analysis of 27 papers that use gravity equations to estimate the effect of TBT/SPS measures on trade. They find that estimates of the trade effects of these measures on agriculture and food industries are less likely to be positive than in other sectors.

In line with the general finding of a negative effect of TBT/SPS measures on trade in agricultural products, the trade literature that uses maximum residual levels (MRLs) of pesticides as an indicator of the stringency of SPS measures consistently finds negative effects of MRLs on imports. Otsuki et al. (2001) find a negative effect of the EU standard on aflatoxin on African exports. In particular, they estimate that moving from the Codex Alimentarius standard, established by the UN Food and Agriculture Organization and the World Health Organization, to the more stringent uniform European Commission standard decreases African exports of cereals, dried fruits, and nuts to Europe by US\$ 670 million. Wilson and Otsuki (2004) find a similar effect for MRLs on chlorpyrifos on bananas exports from Latin America, Asia and Africa to OECD countries.

Chen et al. (2008) find a negative effect of regulations on the utilization of pesticides and medicated fish feed on Chinese exports of fresh vegetables, fish and aquatic products between 1992 and 2004. In particular, they find that a 10 per cent stricter measure in the level of pesticides (medicated fish feed) decreases vegetable (fish and aquatic product) exports by 2.8 (2.7) per cent.

Several studies show that any negative effects of TBT/SPS measures on trade are concentrated mainly in developing-country exports to developed countries. In contrast, exports from developed countries to other developed countries are not significantly impeded by these measures.²⁶

For example, focusing on SPS measures, Anders and Caswell (2009) find substantially different effects between developed and developing countries. They estimate the trade impact of mandatory “hazard analysis and critical control points” (HACCP)²⁷ requirements for seafood products in the United States between 1990 and 2004. US seafood imports across all exporters were reduced. SPS measures caused a loss in trade value of between US\$ 11.4 million to US\$ 30.6 million. The impact on developing countries as a group amounted to an export value reduction of 0.9 per cent under HACCP standards, while developed countries as a group gained from the measure.

However, there is wide variation across developing countries. Anders and Caswell (2009) find that larger seafood exporters gained trade shares with the United States, while smaller exporters lost ground. Developing countries were found among both the gaining and the losing group. The trade impact of SPS measures appears to depend in part on the size of the exporter. Similarly,

examining the trade effects of notified SPS and TBT measures adopted by the United States, the European Union, Japan, Canada, Australia and Switzerland, Disdier et al. (2008a) find an overall negative effect on total exports from African, Caribbean and Pacific (ACP), Latin American and Asian countries. While ACP country exports appear to have been significantly negatively affected by such measures, the impact on Asian countries is not statistically significant.

Empirical research on domestic services regulation has not examined whether these measures have a different impact on developed and developing countries. This is mainly due to lack of data on services measures for developing countries. As regards differences across sectors, the above-mentioned study by Kox and Nordås (2007) finds that regulation matters more for “other business services” (including legal services, accounting, architecture and engineering) than for “total services” (as measured by total trade through modes 1, 2 and 4). This is consistent with the important role that business services play in production chains and how a marginal increase in trade costs can have a magnified impact on overall trade costs when the production process is fragmented across countries (see Section D.1 and Box D.2).

Box D.4: Environment-related measures

One of the basic concerns with environmental regulation is that, in a world where countries differ in the stringency of their environmental regulations and industries differ in their pollution intensities, pollution-intensive firms will locate production in less regulated countries. Therefore, pollution-intensive products will be exported by less regulated countries and imported by countries with more stringent regulation.

In their survey on the effect of environmental regulations on US manufacturing, Jaffe et al. (1995) concluded that there was little empirical evidence that differences in environmental regulations affected international trade and investment flows.

More recent studies have attempted to explain this finding, examining more disaggregated data and treating sample variations more carefully. The general finding is that the impact of environmental regulation on trade changes by country and sector. For example, Ederington et al. (2005) argue that environmental regulations have stronger effects on the pattern of trade between developed and developing economies than among developed countries.

Using data for 21 OECD countries and a gravity model of trade augmented with an indicator of strict environmental regulation, van Beers and van den Bergh (1997) find that strict environmental regulation does not increase imports. However, while they do not find that environmental regulations in pollution-intensive sectors have a significant overall effect on exports, they do find that these measures have a significant and negative effect for those pollution-intensive sectors that are resource based (being less geographically mobile). The finding that stricter environmental standards have a negative impact on exports from pollution-intensive industries is also confirmed in the study by Otsuki et al. (2001).

Focusing on environment-related measures notified under the SPS and TBT agreements, Fontagné et al. (2005) find that for trade in fresh and processed food, these measures tend to restrict trade from developing countries and least-developed countries (LDCs). However, exports from developed countries are not restricted. On the other hand, for the majority of manufactured products, these environmental regulations have either no significant effect or a positive effect, and this result applies to countries at all stages of development.

(c) Volume of trade and export markets diversification

The economic literature examines TBT/SPS measures in goods and equivalent domestic regulation in services as possible fixed costs of entry in a market (Baldwin, 2000 and 2005, and Deardorff and Stern, 2008; Kox and Lejour, 2005) – that is, an initial cost to be paid to access a market. For example, a large initial investment may be required for a firm to comply with a certain foreign standard, but once the new technology is acquired there may be no additional variable costs.²⁸ Similarly, a qualification or certification requirement for service-providing personnel may involve an initial fixed cost of obtaining the qualification or certification, but no additional variable costs.

As discussed in Section B, assuming the existence of fixed costs to enter a certain market, models of trade with heterogeneous firms show that only the most productive firms in an industry will export. As trade costs are lowered, high-productivity exporting firms expand. The most productive firms enter export markets, while low-productivity firms shrink or exit the market. In these models, the volume of trade between two countries changes both because incumbent exporting firms expand their trade (thus increasing the so-called intensive margin of trade) and because new firms enter the foreign market (thus increasing the extensive margin of trade).²⁹

Relatively little is known about how TBT/SPS measures affect individual firms and, in particular, their export decisions. In order to shed light on this issue, the following analysis studies firms' decision to export to a market and the volume of their exports.³⁰ The advantage of using firm-level data is that it allows us to distinguish between the number of varieties exported by firms, the number of exporting firms, and the value of exports by firms.

To measure the stringency of regulatory measures, the study uses the database on specific trade concerns raised by WTO members in the SPS and TBT committees.³¹ While databases typically used³² to capture the impact of TBT/SPS measures include both measures that restrict trade and those that do not, this database contains information only on those measures perceived to be a potential obstacle to trade. A country would not raise a concern if it did not see that measure as an obstacle to trade.³³

Drawing on French firms' custom data³⁴ from 1995 to 2005, the study uses a gravity model of trade to evaluate the effect of SPS and TBT measures raised as specific trade concerns on export performance by firms. The firms' exports are assumed to be determined by demand-side factors (such as income), supply factors (such as sectoral productivity), trade costs (such as distance) and by an additional variable indicating the stringency of SPS and TBT measures.³⁵

Although further research is needed to test the robustness of results, preliminary findings show that TBT/SPS measures raised as concerns in WTO committees are associated with a fall in trade. In particular, TBT/SPS measures raised as specific trade concerns appear to reduce the value of exports. The effect on the number of exporting firms is statistically not significant, but the sign of the coefficient is negative (results of the estimations are reported in Appendix Tables D.1 and D.2).

Other studies also find that TBT/SPS measures have a negative effect on export market diversification. In a study (not at firm level) focusing on textile, clothing and footwear exports, Shepherd (2007) shows that a 10 per cent increase in the total number of EU TBT/SPS measures is associated with about a 6 per cent decrease in the product variety of exports (measured as the number of six-digit HS products under a two-digit HS sector) to the EU.

Using data from a World Bank TBTs survey, Chen et al. (2006) also find that TBT/SPS measures impede developing-country exporters' entry into developed markets. In particular, Chen et al. (2006) estimate that these measures reduce the likelihood of firms exporting to more than three markets by 7 per cent. The study, however, is based on a sample of only 619 firms located in 17 developing countries. The measure of a technical barrier to trade is based on firms answering "yes" to the question "Have quality/performance standards impacted your ability to export products?" In other words, this study finds that firms that claim to find TBT/SPS measures an obstacle to trade also tend to export to fewer markets.³⁶

There is also some evidence that the effects of TBT/SPS measures on export-market diversification changes depending on the type of firms. Standards and technical regulations (if not harmonized) appear to be particularly harmful to trade for firms that import inputs. In fact, outsourcing firms appear less likely to diversify their export markets than firms that do not outsource. The underlying reason may be that, when inputs are produced, their ultimate destination is unknown and thus they may not meet the technical requirements imposed in the market of the final product (Chen et al., 2006).

In addition, TBT/SPS measures appear to negatively affect market entry even more for small firms. Focusing on the electronics sector, Reyes (2011) examines the response of US manufacturing firms to the harmonization of EU product standards with international norms. He finds that harmonization increases the entry of firms, and that the effect is stronger for US firms that already export to developed countries but not to the European Union. As expected, these firms are on average smaller than firms already exporting to the European Union. Focusing on Senegal, Maertens and Swinnen (2009) show that vegetable

exports have risen sharply despite increasing sanitary requirements, resulting in important income gains and poverty reduction. However, tightening food regulation also induced a shift in the profile of exporters from small farmers to large-scale integrated estate production.

Overall, firm-level studies show a negative effect of TBT/SPS measures on trade, both through a lower volume of trade per firm and reduced market entry. This result may be partly explained by the type of variable used in some of these studies for TBT/SPS measures, which tend to capture only restrictive measures. In addition, some evidence points to TBT/SPS measures being particularly trade restrictive for small firms and outsourcing firms. However, more research is needed to understand how these results vary across sectors and firms.

There is no firm-level study looking specifically at the effects of domestic regulation (narrowly defined as of GATS Article VI.4) on export-market entry for services. Using aggregate data, Kox and Nordås (2007) find that the determinants of market entry and the volume of trade are largely the same. In particular, domestic regulations aimed at ensuring higher quality standards in financial services (accounting standards and financial statement transparency) appear to be associated with both higher export values and increased entry. However, existing evidence on services is too limited to draw general conclusions.

(d) Does conformity assessment matter for goods trade?

Conformity assessment refers to testing, inspection and certification, as well as to a supplier's declaration of conformity.³⁷ Conformity assessment procedures are necessary for achieving important policy objectives, such as the protection of consumers' health and safety. They can, however, also be unnecessary obstacles to trade when they are duplicative, inefficient or applied in a discriminatory manner.

Testing, inspection and certifying compliance with a certain TBT/SPS measure entails costs. These costs are necessary because they assure compliance with the required standard. Yet, they can also be an unnecessary obstacle to trade, when foreign providers are competent to provide the required level of assurance in a cost-effective manner, but this competence is not recognized by the importing country. Ideally, attestation of conformity would be carried out just once in a cost-effective manner and then recognized everywhere. Yet, even the existence of a well-functioning technical infrastructure in many countries does not automatically lead to single conformity assessment, thus unnecessarily increasing transaction costs (see Section B.1).³⁸

There are several dimensions of conformity assessment costs. It is not just that the fees for

testing, inspection or certification may be unnecessarily high. Unnecessary costs also arise because exporters need to comply with testing and certification requirements in each of the countries to which they are exporting. Even if importing countries rely on internationally harmonized product standards – or accept another country's standards as equivalent – they may still have a separate conformity assessment requirement. This can substantially increase the costs of exporting, not least because exporters face the risk that goods are rejected by the importing country after shipment.

When conformity assessment requirements differ significantly across countries, and the procedures are opaque, companies may face additional costs associated with obtaining the necessary information, and redesigning products to meet different countries' conformity assessment standards and requirements.

In addition, lengthy conformity assessment procedures also imply additional costs associated with sales revenues forgone while the product is under review. For some time-sensitive products, such as textiles and clothing and high-technology products with a short life cycle, time delays can have a severe impact on profitability and market penetration.

Conformity assessment costs have not been systematically quantified. This is because some aspects, such as the opportunity cost of lost sales, are difficult to measure. However, the extent to which conformity assessment costs are perceived as obstacles to trade clearly emerges from several surveys and case studies (see Box D.5).

Little is known about the impact of conformity assessment procedures on trade. Focusing on a sample of developing countries, a study by Chen et al. (2006) claims that conformity assessment issues significantly impede trade. On the basis of firm-level survey data, they find that firms answering "yes" to the questions "Have testing procedures impacted your ability to export products?" and "Do you have difficulty obtaining information about applicable regulations in the countries listed?" also have a significantly lower propensity to export. They also find that testing procedures are particularly burdensome for agricultural firms.

In all likelihood, the impact of conformity assessment procedures on trade varies across sectors. The OECD (1999) survey stresses that even the nature of conformity assessment costs varies by product according to their technical characteristics. Terminal telecommunications equipment and automotive components, for example, require an initial approval of the product before it can be exported. In the case of dairy products, each individual consignment must be tested both prior to export and/or at the port of entry. Thus conformity assessment procedures are a fixed

Box D.5: Reporting of conformity assessment procedures as barriers to trade: selected examples

The fact that conformity assessment costs are perceived as important obstacles to trade clearly emerges from several surveys. In the business survey on non-tariff measures conducted by the International Trade Centre (see Section C.2), product certification, product testing and inspection requirements applied in importing countries represent more than half of all firms' complaints about TBT/SPS measures in the 11 developing countries analysed.

Costs of certification also appear as a prominent obstacle to trade in a survey on the effects of SPS-related private standards conducted by the WTO Secretariat (see G/SPS/GEN/932/Rev.1). Seventeen out of the 22 respondents included a reference to high certification costs. The survey also notes that developing-country exporters consider compliance with private standards to be a prerequisite for exporting to a large number of developed-country markets.

Compliance costs for private standards are high, and they are significantly affected by the cost of certification. While the cost of certification varies depending on the sector, the examples provided indicate that the average annual certification fee may reach between US\$ 2,000 and US\$ 8,000 for a private standard. In addition, countries report significant costs associated with the time-consuming process of meeting private-standard requirements, especially for microbiological and chemical analyses, not to mention the difficulty of finding accredited laboratories with adequate detection techniques. These costs rise significantly when tests have to be conducted abroad. Overall, these costs are deemed a significant impediment to trade for small-scale producers that, as a consequence, are excluded from production chains.

Testing and certification costs also appear to be a significant obstacle to trade for exports from developed countries. The 2011 National Trade Estimate Report on Foreign Trade Barriers (NTE Report) – an annual survey carried out by the United States Trade Representative to identify foreign barriers to US exports – offers several examples. For instance, it claims that “Thailand imposes food safety inspection fees in the form of import permit fees on all shipments of uncooked meat. Currently, imports face fees of 5 baht per kilogram (approximately \$160 per ton) for red meat (beef, buffalo meat, goat meat, lamb, and pork) and for offal, and 10 baht per kilogram (\$320 per ton) for poultry meat. Fees for domestic meat inspections are much lower and are levied in the form of a slaughtering or slaughterhouse fee. The fees are \$5 per ton for domestic beef; \$21 per ton for poultry; \$16 per ton for pork; and zero for offal”.

Lengthy certification procedures can also be the main obstacles to trade. For example, the 2011 NTE Report relates US industry concerns about lengthy approval procedures for new pharmaceutical products in Hong Kong, China, which inhibits their ability to market products on a timely basis. Similarly, the NTE Report raises a concern over Paraguay's “non-automatic import licenses on personal hygiene products, cosmetics, perfumes and toiletries, textiles and clothing, insecticides, agrochemicals, and poultry. Obtaining a license requires review by the Ministry of Industry and Commerce and sometimes by the Ministry of Health. The process is slow, taking up to 30 days for goods that require a health certification. Once issued, the certificates are valid for 30 days.”

cost of exporting telecommunications equipment and automotive component markets – borne in advance. On the other hand, they are a variable cost for dairy exports.

A study by Schlueter et al. (2009) looks at trade effects of different types of SPS measures imposed on meat products. After grouping 21 types of measures in six classes, they find that whereas disease-prevention measures, tolerance limits for residues and contaminants, and conformity assessment and information requirements increase trade, production-process requirements and requirements for handling of meat after slaughtering restrict trade.

The paper by Fassarella et al. (2011) looks at the impact of SPS and TBT measures on exports of poultry meat by Brazilian exporters to the main world importers in the period 1996 to 2009. They find that the impact of aggregated TBT and SPS measures on Brazilian

poultry meat exports are insignificant. However, when measures are disaggregated, conformity assessment has a negative and significant impact on the volume of Brazilian poultry meat exports, while packaging and labelling requirements, and/or disease-prevention measures (regionalization or quarantine treatment) have a positive and significant impact on the volume of Brazilian poultry meat exports.

This report attempts to assess the importance of conformity assessment requirements relative to product-characteristics regulations on overall food and agricultural trade.³⁹ Relying on the database on specific trade concerns regarding SPS measures described in Section C, the analysis distinguishes between concerns related to conformity assessment (such as certificate requirements, testing, inspection, and approval procedures) as set out in Annex C of the SPS Agreement, and concerns related to other issues

(such as requirements on disease treatment, maximum residual levels, or the geographical application of the measure). The impact of these two types of concerns on the probability that firms will export and on the volume of trade is analysed using both a simple dummy for the existence of an SPS measure and a frequency measure.⁴⁰

The analysis suggests that, in general, SPS measures imposed by an importing country and raised as specific trade concerns have a negative impact on the probability that firms will export to the market concerned (results are reported in Appendix Table D.3). However, conditional on the probability that firms export (that is, for firms already in the export market), the value of exports increases.⁴¹ In particular, the results suggest that it is conformity assessment-related factors that have the most negative impact on the probability of entering a market, while measures related to the characteristics of the product explain most of the positive impact on the value of trade. Although more research is needed, one possible explanation is that SPS measures, by enhancing consumers' trust in imported products, increase trade for those exporters that manage to overcome the fixed cost of entering a market.

In sum, the empirical evidence suggests that conformity assessment costs (mostly relating to trade in food and agricultural products) are an important obstacle to trade.

3. Harmonization and mutual recognition

The discussion in the previous sub-sections suggests that the use of TBT/SPS measures and domestic regulation in services by the importing country can have ambiguous effects on trade. In the event that they have adverse trade effects, it is imperative to consider how these harmful trade impacts may be alleviated.

Harmonization and mutual recognition of TBT/SPS measures are commonly believed to be steps towards more open trade. However, economic theory provides an ambiguous answer to the question of whether harmonization increases or decreases trade, as well as whether harmonization has more impact than mutual recognition on boosting trade (see Box D.6). This section, therefore, reviews the empirical evidence on these issues.

(a) Is harmonization trade creating?

The empirical literature measures the extent of harmonization of standards in different ways. Some studies consider a standard as harmonized if it conforms with an international standard published by the International Organization for Standardization

(ISO), the International Electrotechnical Commission (IEC), the International Telecommunication Union (ITU) or similar bodies. Other studies treat standards as harmonized if they are common to a group of countries.

Notwithstanding these differences, a general finding in the literature is that harmonization increases trade. For example, using the number of bilaterally-shared standards reported in the standards-related data from the Perinorm database, and taking country-specific standards into account, Moenius (2004) finds that shared standards have a positive and significant effect on bilateral trade.

Using a gravity model of trade for the period 1995-2002, Clougherty and Grajek (2008) find that conformity with ISO 9000 in developing countries appears to enhance exports to developed countries (a similar effect was estimated in Grajek (2004)). The authors do not, however, find that conformity with ISO standards in developed countries has a significant effect on either exports or imports. Focusing on trade within the European Union, Vancauteran and Weiserbs (2005) find that harmonization has a significant effect on a country's exports.⁴² In particular, they find that countries that have a larger than average share of trade in sectors covered by the EU harmonization directive export more. More recently, using an index of variations in regulation on veterinary drugs and pesticides across countries, Gervais et al. (2011) estimate that differences in standards have a negative effect on trade in pig meat and beef.

Harmonization is also found to have a positive effect on the diversification of export markets (the so-called extensive margin of trade) – that is, on the number of exported varieties and export destinations. Albeit limited by the lack of firm-level data, Shepherd (2007) is the first study to explore the impact of harmonization at the extensive margin of trade. Focusing on the exports of textiles, clothing, and footwear, he finds that harmonization is associated with higher export variety, mainly for low-income countries' exports to the European Union.

Focusing on the electronics sector, Reyes (2011) examines the response of US manufacturing firms to the harmonization of EU product standards with international norms. The author uses the share of non-harmonized standards in an industry⁴³ as a measure of trade costs due to a variety of standards.

Reyes' study finds that increasing harmonization increases US exports to the European Union. In particular, this increase is due to more US firms entering the EU market. Exports from US firms already present in the EU market before the harmonization decrease. Overall, exports increase. Product standard harmonization seems to be more important than tariffs for the propensity to export. Furthermore, new exporting firms are smaller than those already exporting to the

Box D.6: Harmonization versus mutual recognition

This box explores the possible role of harmonization and mutual recognition of TBT/SPS measures and compares their advantages and disadvantages. For the purposes of this box, TBT/SPS measures and domestic regulation in services are treated together as “standards” because the conclusions from the theoretical literature apply generally to goods and services regulation.

Suppose that two trade partners are confronted with the same market failure but address it with the use of different standards. This means that existing exporters will have to bear the costs of adapting their products to the requirements of the destination country or produce goods that meet both standards. The different standards of regulation have a negative effect on market entry – the extensive margin of trade – as it acts as a fixed market entry cost (Kox and Lejour, 2005).

Now, consider a case in which a firm operating under increasing returns to scale⁴⁴ serves the domestic market and can potentially export to three foreign markets, upon paying a fixed (sunk) market entry cost. If this cost is market-specific, the firm can only realize market-specific economies of scale in each of the export markets. Since the two countries have the same market failure, an effective solution for both countries would be to choose a common standard or recognize each other’s standard.

Harmonization implies a common definition of both the policy objective and the technical requirements to achieve it, while mutual recognition refers to the reciprocal acceptance of the measures applied in both countries. Both approaches are considered trade-enhancing as they produce economies of scale and permit a more efficient allocation of resources (Chen and Mattoo, 2008). Taking the example of the firm described in the previous paragraph, if the fixed cost of entry is the same for all export markets, as is the case under mutual recognition and harmonization, the firm can realize global economies of scale, and realize cost savings. However, each solution affects trade in a different way and, in general, it is not possible to define whether harmonization or mutual recognition is more trade-enhancing.

In general, harmonization is expected to boost trade more than mutual recognition for the following reasons. As countries adopt the same standards, products are more homogenous and better substitutes for both producers and consumers than in a mutual recognition framework, thus reducing home-bias – that is, the general preference for domestically-produced goods (World Trade Organization (WTO), 2005b). Common standards lower the information costs faced by consumers and increase their confidence about the quality of imported products (Dissanayaka et al., 2001). This also applies for business-to-business relationships, where harmonization enhances communication effectiveness (Grajek, 2004). They also allow compatibility between imported and domestically-produced products (Baller, 2007).

However, it is possible that harmonization can have a negative impact on trade that can be avoided through mutual recognition. Harmonization reduces the number of varieties in the market (for example, harmonization to a certain higher-quality standard removes from the market lower-quality products that some consumers may have been willing to buy). When demand for foreign products is driven by love for variety, a lower degree of differentiation among products will diminish trade. Moreover, harmonization may generate compliance costs that vary for different countries if certain countries lack the expertise to take full part in the setting of international standards or if they lack bargaining power. In this case, the gains from harmonization will not be equally distributed among participating countries.

In contrast, mutual recognition allows an equal distribution of gains from removing TBT among countries. When this approach is in place, firms can sell in foreign markets without bearing the cost of harmonization. Therefore, when love for variety is important for trade or when costs of adaptation to a new (harmonized) technology are high, mutual recognition should be expected to boost trade more than harmonization.

Harmonization and mutual recognition also take place within regional agreements, with different consequences for trade with countries that are not part of the agreement (World Trade Organization (WTO), 2005b; Chen and Mattoo, 2008; Mattoo and Sauv e, 2003). On the one hand, harmonization decreases the costs of learning about the regulation of each member of the agreement and avoids the associated costs of compliance, thus benefiting producers that are not in the agreement. On the other hand, it can increase compliance costs for firms outside the agreement, especially for firms in less developed countries, which often lack the infrastructure and expertise required to comply with new regulations (Otsuki et al., 2001). With mutual recognition, external producers can choose to produce according to the standards adopted in the country that better suit their production advantages, implying lower costs.

European Union before harmonization. These results suggest that working towards a harmonization of product rules across markets could assist small- and medium-sized firms in entering new export markets.

Economists have argued that differences in regulation across countries (policy heterogeneity) reduce services trade in the same way that it does for goods. As discussed in Box D.2, Kox and Lejour (2005) show that in a standard monopolistic competition model of trade, different standards of regulation across countries reduce bilateral trade.⁴⁵ In support of this theoretical prediction, empirical evidence shows that mutual recognition or regulatory harmonization have a positive effect on trade.⁴⁶

De Bruijn et al. (2008) consider the prospective effects of the EU Services Directive, proposed in 2004 by the European Commission to reduce the impediments to trade, on bilateral trade in commercial services. By combining the changes in regulatory diversity with the empirical results of the gravity analysis, they estimate that total trade of commercial services within the European Union increases by an average of 28 per cent as a result of the Services Directive, as approved in 2006. This rises to 44 per cent for the original proposal by the European Commission, which included the country of origin principle.⁴⁷ As they argue, such large differences implicitly show the economic benefits of mutual recognition of regulatory standards.

In addition, Kalemli-Ozcan et al. (2010) consider the retrospective effects that regulatory harmonization based on the EU's Financial Services Action Plan (FSAP) had on cross-border banking activities. Such activities increased significantly among European countries that quickly adopted the financial services directives of the FSAP. Their results suggest that legislative harmonization in financial markets had a positive effect on cross-border banking integration that is additional to the generally positive effects of euro area membership.⁴⁸

(b) Regional integration

A growing number of regional/preferential trade agreements include provisions on TBT/SPS measures. The analysis of the content of preferential trade agreements (PTAs) in last year's report (WTO, 2011) show that approximately 60 per cent of the agreements include such provisions.

In particular, mutual recognition of conformity assessment and harmonization of technical regulation are among the most common approaches of integration in the TBT area. While the objective of fostering mutual recognition of conformity assessment tends to be a feature that occurs with equal frequency across several types of PTAs, significant differences exist in terms of their tendency to include

harmonization of technical regulations between EU-type and North American-type agreements. For example, while the agreements signed by the European Union typically include harmonization provisions, PTAs involving North American countries tend to include mutual recognition of technical regulations.

Furthermore, last year's report highlights two features of PTAs. First, PTAs that harmonize standards are likely to present "hub-and-spoke" characteristics, with the larger partner representing the hub to whose standards the spokes conform. Therefore, the report cautions that this tendency may hinder further trade opening among major regional groupings. Secondly, "deep" PTAs (that is, more ambitious PTAs in terms of the depth of integration of TBT provisions) are more likely between countries at higher and similar levels of development. Therefore, the report warns about the risks of moving towards a two-tiered world that would further marginalize developing countries.

This year's report takes the analysis a step further and looks at the evidence of how harmonization and mutual recognition provisions in PTAs affect trade. Harmonization and mutual recognition, when they occur at the regional level, affect countries outside the region differently. While harmonized standards allow entry into the whole regional market once the harmonized standard is adopted, mutual recognition may not provide access to third countries. For example, agreements involving mutual recognition of conformity assessment procedures are likely to have trade-diverting effects for countries outside the agreement if they are subject to strict rules of origin (i.e. laws, regulations and administrative procedures which determine a product's country of origin).

Suppose, for example, that following an agreement between country A and country B, only goods made in country A (satisfying specific rules of origin) can circulate freely in country B after being tested and certified in A. This privilege does not extend to products originating in third countries. Therefore, a firm located in country C will have to pay twice as much as a firm located in A (or B) for conformity assessment in order to access markets A and B. In the case of services, suppose that countries A and B have signed an agreement providing for mutual recognition of qualification requirements. A services provider from country C willing to serve both A and B markets will have to pay twice as much to obtain the necessary qualification requirements. Mutual recognition of conformity assessment procedures (in the former example) or of qualification requirements (in the latter example) between A and B when accompanied by rule of origin therefore increases the costs for firms located in third countries relative to firms located in A and B, thus diverting trade.

Very few empirical studies have looked at how SPS/TBT-related policies in PTAs have affected trade

both within and outside the region covered by the agreement. Existing studies indicate that regional agreements on harmonization tend to divert trade and that trade diversion affects exports negatively, especially from developing countries. For example, Cadot et al. (2010) show that the existence of PTAs between developed and developing countries (North-South agreements) hurts trade between developing countries (South-South trade) and impedes developing countries' attempts to diversify into new markets.

Chen and Mattoo (2008) estimate a gravity model of bilateral trade of 28 OECD countries and 14 non-OECD countries at the three-digit SITC product level. Their analysis indicates if two countries have signed a mutual recognition agreement (MRA) for a certain sector and the number of harmonization directives between the two countries for a product. The analysis also indicates whether MRAs include rules of origin.

Chen and Mattoo find that harmonization agreements can increase trade between participating countries but will not necessarily increase trade with other countries. In particular, they find that harmonization increases exports from developed countries outside the region, but it reduces exports from developing countries outside the region. MRAs tend to increase trade within the region. MRAs also increase trade with countries outside the region if they are not associated with rules of origin. However, when the MRAs contain rules of origin, trade with countries outside the region is negatively affected, especially exports from developing countries.

Finally, focusing on two sectors, telecommunications equipment and medical devices, Baller (2007) examines the impact of MRAs and harmonization agreements on bilateral trade among 26 OECD countries and 22 non-OECD countries.⁴⁹ Her results indicate that while MRAs increase both the probability of entering a new market (the extensive margin of trade) and the volume of trade (the intensive margin), harmonization of standards or technical regulation has ambiguous effects. Like Chen and Mattoo (2008), her findings suggest that regional harmonization increases trade with developed countries but hinders trade with developing countries.

There is no empirical analysis that looks specifically at the discriminatory effects of MRAs concerning domestic regulation in services. The few empirical studies on trade diversion in the services sector⁵⁰ use dummy variables indicating the existence of a preferential trade agreement between two given countries. Such variables do not allow us to distinguish between market access and national treatment commitments (i.e. the principle of giving others the same treatment as one's own nationals), on the one hand, and mutual recognition of standards and requirements, on the other hand.

As argued by Fink and Jansen (2009), the scope for discrimination is likely to be limited by two factors. One is that MRAs tend to apply mostly to restrictions relevant for mode 4 movements, a mode of trade that even at the regional level has not benefited from significant levels of trade opening. The other factor is that MRAs tend to apply to only a small number of professional services sectors, notably accounting, architects and engineering, and only a few MRAs feature automatic recognition of qualifications (OECD, 2003).

To sum up, evidence suggests that regional integration of TBT/SPS measures has trade-diverting effects, especially to the detriment of developing countries. This finding is consistent with the evidence that deep preferential trade agreements in the area of TBT/SPS measures are more likely among countries with a higher and more similar level of income. This finding also highlights the risk that regional integration on TBT/SPS measures may lead to a multi-tiered world where certain developing countries are marginalized.

4. Conclusions

The trade literature estimates the degree of restrictiveness of non-tariff measures and services measures by estimating an "ad-valorem tariff equivalent (AVE)", i.e. the level of an ad-valorem tariff that would have an equally trade-restricting effect as the measures at issue. The use of AVEs to measure the trade impact of NTMs, however, presents conceptual and methodological limitations. For example, the equivalence of tariffs and quotas breaks down in the presence of market uncertainty, or when NTMs take the form of fixed market entry costs, such as those associated with meeting certain technical requirements.

AVEs do not adequately capture the trade-restrictive impact of certain non-tariff measures when the production process is fragmented across countries because they fail to take into account the cumulative effect of measures along the production chain. Additionally, in the case of services measures, the estimated AVEs neither account for the possible substitution between different modes of supply nor for the complementarity between trade in services and trade in goods.

Notwithstanding these limitations, existing empirical evidence suggests that non-tariff measures and services measures can significantly restrict trade. In particular, NTMs can be as trade-restrictive as tariffs, and even more so in the case of certain high- and middle-income countries. In the case of services measures, while restrictions to trade are generally higher in developing countries than in developed countries, they do not appear to be systematically associated with a country's level of development.

A comparative analysis of the role that various types of non-tariff measures play in the overall level of NTM

restrictiveness does not exist. However, it is clear that the impact on trade is not necessarily restrictive for all measures. TBT/SPS measures do not unambiguously increase or decrease trade. In general, TBT/SPS measures have positive effects for more technologically advanced sectors, but negative effects on trade in fresh and processed goods. As economic theory suggests, the introduction of a new TBT/SPS measure yields a trade-off between higher costs of adaptation to new requirements for producers and lower information costs for consumers, who can be confident about the quality of the product in question. The prevalence of a positive effect of TBT/SPS measures on manufacturing goods may suggest that information costs are more important or adaptation costs lower in these sectors than in non-manufacturing sectors.

When TBT/SPS measures have a negative effect, the impact tends to be greatest for developing-country exports. There is also evidence that TBT/SPS measures have a more negative impact on trade in food and agriculture – mainly because of the costs associated with conformity assessment procedures. In addition, TBT/SPS measures appear to reduce the likelihood of export market diversification. Small firms – and firms that outsource their intermediate inputs – appear to be most affected by TBT/SPS measures.

Harmonization and mutual recognition of standards are ways in which any negative effects of TBT/SPS measures can be mitigated. Harmonization is shown to enhance the presence of small and medium-sized firms in export markets. However, if harmonization or mutual recognition occurs within regional trade agreements, there may be significant trade-diverting effects on countries outside the agreement. This appears to be especially the case for developing countries. Furthermore, as stressed in last year's World Trade Report, there is a risk of a "lock-in" effect, whereby the regional harmonization of standards may reduce incentives for further trade opening. There is also a risk of a multi-tiered regulatory world emerging, in which developing countries are marginalized.

The economics literature on domestic regulation related to qualification and licensing requirements and procedures and technical standards is extremely limited. Most studies look at a much wider set of services measures and are, therefore, not informative for this report. In relation to the financial services sector, the existing literature finds that regulation aimed at ensuring appropriate standards (such as accounting standards and financial statement transparency) is positively associated with cross-border trade and foreign direct investment in financial services. As with TBT/SPS measures, there is also some evidence that a reduction in policy diversity, carried out through mutual recognition or convergence of international standards, has increased services trade.

Regardless of their objective, TBT/SPS measures and domestic regulation in services may or may not reduce trade. Negative trade effects, when they exist, generate negative spillovers across countries. This provides a rationale for international cooperation. Harmonization and mutual recognition help to reduce the undesired negative trade effects of legitimate public policy. However, both approaches highlight the need for capacity building to address regulatory challenges in developing countries.

The costs related to compliance and conformity assessment impinge particularly on developing countries. This is because they lack the technical infrastructure necessary to effectively develop and design technical regulation, standards and conformity assessment procedures. Also, they lack the laboratories and accredited certification bodies to test and certify compliance with a certain standard. These issues are the focus of Section E.

Endnotes

- 1 This section only focuses on domestic regulation measures relating to qualification and licensing requirements and procedures, and technical standards. This narrow set of measures is the equivalent in services of TBT/SPS measures in goods.
- 2 The agricultural sector may also be subject to core NTMs.
- 3 It is worth noting that these AVEs were constrained to be trade impeding through an exponential transformation in the estimated equation. This takes away from the fact that NTMs may actually enhance trade at times.
- 4 See Box D.1 for a description of the TTRI and OTRI.
- 5 This assumes perfect information. If, for example, quality differences between products are signalled by technical regulations, such NTMs could lower prices and increase trade.
- 6 See Box D.1 for a description of the market access versions of the TTRI and OTRI.
- 7 As explained in Box D.1, this is a measure of the restrictiveness faced by exporters.
- 8 This follows a World Bank classification of these countries according to data in 2001.
- 9 Using the "price gap" method to estimate the impact of NTMs on trade, Bradford (2003) finds the AVEs of NTMs to be of the same order of magnitude for a sample of developed countries, thereby reinforcing the results of Kee et al. (2009). However, the former's estimates are distinctly higher because the study uses the "price gap" method – AVEs are measured as the difference between import and retail prices, after correcting for transport and distribution costs, and hence include more policy restrictions in their definition of NTMs (Kee et al., 2009). At the same time, it is possible that for certain NTMs, quantity-based econometric methods give biased estimates. In the case of TBT and SPS measures, for instance, if compliance costs are passed on to unit values, regressing the value of imports on a measure of NTMs will underestimate their trade impact. Similarly, if there is market power in the importing country, the domestic price will rise by more with a quantitative restriction (QR) than a tariff reducing imports by the same amount. Hence, the AVE of a QR, derived from a quantity-based estimation, would be underestimated.
- 10 Regressing the natural logarithm of the AVE of NTMs in 2001 on the level of GDP per capita in 2001, we found a p-value of 0.133.
- 11 The estimated trade effect represents the percentage premium on products restricted by an NTM in a country relative to the price of those products in countries without NTMs.
- 12 This is different from the implication of "binding" in a legal sense. It refers to the fact that conditional on presence of tariffs and other NTMs, the trade effect of a particular NTM may not be statistically significantly different from zero.
- 13 Even the landed duty-paid price may contain wholesale and retail margins because importers, wholesalers, and retailers may share the NTM rents among themselves, especially since large retailers are integrated into the earlier stages of the distribution process (Bannister, 1994; Krishna and Tan, 1992).
- 14 See Section C for a description of the methodology.
- 15 The four services categories are travel, transport, government and commercial services.
- 16 Transport, travel, communications services, construction, insurance, financial services, royalties and licence fees, computer and information services, other business services, government services and personal, cultural and recreational services.
- 17 For developed countries, as much as three-quarters of services trade is in intermediate inputs (Miroudot et al., 2009).
- 18 Manufacturers may choose to export directly or through intermediaries who move goods through wholesale and retail distribution networks. Ahn et al. (2011) show that the share of export through intermediaries is positively correlated with the difficulty of accessing destination markets. This is because when barriers to trade are large, relatively small and less productive exporters use intermediaries to export.
- 19 According to Bernard et al. (2011), however, there are large variations in the importance of intermediaries across countries (and products).
- 20 Multinational retailers also tend to source their private labels from developing countries (Nordås, 2008) and there are cases where they have provided the scale and stability of demand necessary for developing country farmers to invest in modern production technology (Dolan and Humphrey, 2010).
- 21 The trade effects of regulatory heterogeneity (with a focus on TBT/SPS measures and domestic regulation in services) are further analysed in Section D.3.
- 22 Perinorm contains information on all standards developed in the 21 countries covered, including information on the relationship among standards originated in different countries. This information defines whether two standards are identical, equivalent or non-equivalent, on the basis of ISO/IEC Guide 21.
- 23 There is a large literature that studies the effect of regulation in services on trade using Product Market Regulation (PMR) indicators. See for instance Nicoletti and Mirza (2004), Lennon et al. (2009) and Schwellnus (2007). In general this literature estimates a negative effect of regulation on services trade. However, PMR covers a range of measures that goes beyond domestic regulation as of GATS Article VI.4. Therefore, they are not taken into account in this review. The same issue pertains also to other studies such as Nicoletti et al. (2003) that use the index of non-manufacturing regulations (NMR) and Kimura and Lee (2006) that use an "Economic Freedom of the World" (EFW) indicator.
- 24 The Annex on Financial Services in the GATS explicitly allows countries to take prudential measures to protect investors and depositors and to ensure the integrity and stability of the financial system. The analysis of Kox and Nordås (2007) shows that most such measures have a positive effect on services trade. This effect is larger for regulation in the exporting country than for regulation in the importing country.

- 25 Gravity models are econometric models of trade which acquire their name from their similarity to Newton's theory of gravitation. The gravity model of trade predicts that the volume of trade between any two countries will be positively related to the size of their economies (usually GDP) and inversely related to the distance (and other measures of trade costs) between them.
- 26 See, for example, OECD (1999); Otsuki et al. (2001); Wilson and Otsuki (2004); Gebrehiwet et al. (2007); and Disdier et al. (2008a).
- 27 HACCP is a food safety and quality management system that involves monitoring, verifying and validating compliance with regulatory requirements in all stages of production at all times.
- 28 Fixed costs are independent of the amount produced or exported, while variable costs increase with the level of production or exports.
- 29 For a review of the theoretical literature on heterogeneous firms, see Helpman (2011) and Redding (2010).
- 30 Details of this analysis can be found in Fontagné et al. (2012).
- 31 For a description of this database, see Section C.
- 32 Measures notified at WTO or Perinorm.
- 33 See Section C.1 for a discussion on available datasets.
- 34 French Custom data contain firm-level data on annual shipments by all exporting French firms in the period 1995-2005 to all partner countries around the world. We thank CEPII for providing access to these data.
- 35 The estimated equation is:

$$y_{d,s,t} = \beta_1 STC_{d,s,t} + D_d + D_s + D_t + D_{t,s} + D_{t,d} + \varepsilon_{d,s,t}$$
 where subscripts s, d and t indicate sector, destination country and year. y is in turn: (i) the average number of varieties exported by firms, (ii) the average value exported by firms, (iii) the number of new firms, (iv) the total number of exporters. The explanatory variable STC is: (i) a dummy variable equal to one if a specific trade concern was raised by France against an SPS or a TBT measure to be adopted in an export market, (ii) the frequency ratio of the number of HS4 sectors affected by the measure within each HS2 sector and the number of HS4 sectors in that HS2. Explanatory variables are lagged one year to capture the possibility that the measure related to a specific trade concern can affect trade with a delay. In fact, STCs may relate to draft measures not yet in force. Fixed effects included in the regression address the omitted variable problem by controlling for all destination-time specific variables (such as income and all demand side variables in destination countries) and sector-time specific aspects (such as sectoral productivity shocks).
- 36 It is unclear to what extent a problem of self-selection may bias these results.
- 37 In a wider sense, it also includes the area of metrology, which is an important prerequisite for conformity assessment and accreditation (the evaluation of the competence of any institution involved in conformity assessment).
- 38 For this reason, governments encourage cooperation between conformity assessment bodies and sometimes are actively involved in mutual recognition agreements (MRAs).
- 39 Details of this study can be found in Crivelli and Gröschl (2012). The study uses a Heckman model to estimate the results. They estimate a probit binary choice model of the form

$$\Pr(\text{import}_{ijtHS4} > 0) = \Phi(\alpha_0 + \alpha_1 SPS_{ij(t-1)HS4} + \alpha_2 X_{ijt} + D_i + D_j + D_t + D_{HS4} + \varepsilon_{ijtHS4})$$
 where $\Phi(\bullet)$ is a standard normal distribution function, and an outcome equation of the form

$$\ln(\text{import}_{ijtHS4} | \text{import}_{ijtHS4} > 0) = \alpha_0 + \alpha_1 SPS_{ij(t-1)HS4} + \alpha_2 X_{ijt} + \alpha_3 \lambda(\alpha) + D_i + D_j + D_t + D_{HS4} + \varepsilon_{ijtHS4}$$
 where D denotes dummy variables and X is a vector of standards gravity control variables and multilateral resistance terms and $\lambda(\alpha)$ is the inverse mills ratio.
- 40 This is the count of the number of SPS measures in place on HS4 product lines within an HS2 sector divided by the number of products within an HS2 sector.
- 41 This last result is in contrast with the finding of Fontagné et al. (2012) discussed above that exports of French firms are negatively affected by TBT/SPS measures on which specific trade concerns have been raised. This may be due to the fact that Crivelli and Gröschl (2012)'s sample includes developing countries. For these countries, the positive demand effects of SPS/TBT measures are likely to be more relevant than for French exporters.
- 42 Similar results are found in De Frahan and Vancauteren (2006) for food products.
- 43 Defined as the number of CENELEC standards that are not identical to an existing IEC standard over the total number of standards in each SIC4 industry.
- 44 A production technology is characterized by increasing returns to scale when average costs fall as the level of production increases.
- 45 Policy heterogeneity is considered as a fixed sunk cost. Due to its fixed cost nature, policy heterogeneity has two effects on the level of bilateral services trade. First, it reduces the number of exporting firms. Secondly, it increases the average size of the exporting firms. In the theoretical framework of Kox and Lejour (2005), the first effect dominates. Therefore, the level of bilateral exports is negatively related to the degree of bilateral policy heterogeneity.
- 46 As argued by Fink and Jansen (2009), mutual recognition in the context of services can cover a wide range of practices including recognition of prudential regulations under financial services (to facilitate mode 3), recognition of educational qualifications with a view to enrolment in higher education or further training (to facilitate mode 2), as well as recognition of professional qualifications (to facilitate mode 4).
- 47 The "country of origin principle" (CoOP) was a key element in the original proposal by the European Commission. According to this principle, operators providing cross-border services into another member state without establishing there permanently would be required to respect only the rules and regulations of their country of establishment, without being subject to other member states' rules each time they crossed a border. The CoOP in fact would have applied mutual recognition of regulatory standards between EU member states (with some limitations). However, the amended Services Directive adopted by the European Parliament and the Council at the end of 2006 excluded the CoOP, which had come under fire because of fears of social dumping. As far as domestic regulation is concerned, the Services Directive provides for the simplification of qualification and licensing requirements and procedures.

- 48 Other studies such as Kox and Lejour (2005) and Kox and Nordås (2007) also attempt to estimate how any negative effect of burdensome regulation on services trade can be reduced through harmonization or mutual recognition. However, they use indicators of regulatory heterogeneity based on the PMR data, measuring heterogeneity in a much wider set of measures than just domestic regulation covered in this report.
- 49 Baller (2007)'s database contains information on eight MRAs relevant to medical devices and 14 MRAs relevant to telecommunications equipment. It also contains information on 22 EU harmonization agreements and 19 ASEAN harmonization agreements.
- 50 Park and Park (2011) apply a gravity regression analysis to four major services sectors – financial, business, communications and transportation services. They find that the PTAs create services trade among members and do not divert services trade from non-members. Van der Marel and Shepherd (2011) find evidence that from a number of sectors – transport, communications, business services, finance, and trade services – PTAs are not only trade creating between member countries, but also with respect to non-members. Francois and Hoekman (2010) is the only study that isolates possible trade diversion effects in services, in particular within the European Union. In this case, evidence of trade diversion is found only for business and informatics and telecoms services, where they estimate a 13.3 per cent increase in trade volumes within the EU relative to third countries.

Appendix D.1

Appendix Table D.1: Effects of SPS measures on export performances by firm						
Dependent variables	Ln n. of varieties exported by firms	Ln n. of varieties exported by firms	Ln exports value by firms	Ln exports value by firms	Number of exporting firms	Number of entry firms
	OLS	OLS	OLS	OLS	Poisson	Poisson
	(1)	(2)	(3)	(4)	(5)	(6)
SPS _{d, s, t-1}	-0.130*** (0.021)		-0.725*** (0.106)		0.065 (0.314)	
SPS Freq _{d, s, t-1}		-0.167*** (0.036)		-0.910*** (0.197)		-0.166 (0.671)
Observations	86850	86850	86850	86850	86850	86850
R-squared	0.343	0.343	0.425	0.425	-	-

Note: The variable SPS denotes a dummy for the existence of a measure (against which a concern was raised) in the sector. The variable SPSFreq is a count of the concerns raised normalized by the number of products (HS4) within an HS2 sector. Results are obtained using one-year lag explanatory variables (aggregate estimation at HS2 level, the sample includes only firms exporting for at least five years during the period 1995-2005). All regressions include time, sector, destination country, time-sector and time-destination country fixed effects. Robust standard errors in parentheses. *** indicates a significance level of 1 per cent.

Source: Authors' calculations using the database from Fontagné et al. (2012).

Appendix Table D.2: Effects of TBT measures on export performances by firm

Dependent variables	Ln n. of varieties exported by firms	Ln n. of varieties exported by firms	Ln exports value by firms	Ln exports value by firms	Number of exporting firms	Number of entry firms
	OLS	OLS	OLS	OLS	Poisson	Poisson
	(1)	(2)	(3)	(4)	(5)	(6)
TBT _{d, s, t-1}	-0.065*** (0.018)		-0.661*** (0.098)		-0.193 (0.319)	
TBT Freq _{d, s, t-1}		-0.062*** (0.023)		-0.876*** (0.133)		-0.217 (0.503)
Observations	86850	86850	86850	86850	86850	86850
R-squared	0.342	0.342	0.425	0.425	-	-

Note: The variable TBT denotes a dummy for the existence of a measure (against which a concern was raised) in the sector. The variable TBT Freq is a count of the concerns raised normalized by the number of products (HS4) within an HS2 sector. Results are obtained using one-year lag explanatory variables (aggregate estimation at HS2 level, the sample includes only firms exporting for at least five years during the period 1995-2005). All regressions include time, sector, destination country, time-sector and time-destination country fixed effects. Robust standard errors in parentheses. *** indicates a significance level of 1 per cent.

Source: Authors' calculations using the database from Fontagné et al. (2012).

Appendix Table D.3: Impact of SPS measures on agricultural and food trade, 1996-2010								
SPS Variable:	SPSFreq _{ij(t-1)HS2}				SPS _{ij(t-1)HS4}			
	Pr(import _{ijtHS4})	ln(import _{ijtHS4})	Pr(import _{ijtHS4})	ln(import _{ijtHS4})	Pr(import _{ijtHS4})	ln(import _{ijtHS4})	Pr(import _{ijtHS4})	ln(import _{ijtHS4})
Dependent Variable:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
SPS measure _{ij(t-1)HS4}	-0.160*** (0.06)	0.641*** (0.15)			-0.144*** (0.05)	0.661*** (0.14)		
SPS Conformity _{ij(t-1)HS4}			-0.309*** (0.08)	-0.473* (0.28)			-0.270*** (0.07)	-0.406* (0.23)
SPS Characteristic _{ij(t-1)HS4}			0.019 (0.07)	0.988*** (0.24)			0.012 (0.06)	0.962*** (0.19)
Controls	YES	YES	YES	YES	YES	YES	YES	YES
Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES
Estimated correlation (rho)		0.461 (0.01)		0.508 (0.01)		0.460 (0.01)		0.460 (0.01)
Estimated selection (lambda)		1.372 (0.04)		1.091 (0.04)		1.370 (0.04)		1.371 (0.04)
Log pseudolikelihood		-7773030		-7772832		-7772958		-9756160
Wald Chi2		49855.54		49752.98		49914.95		49838.46
Observations		5, 452, 530		5, 452, 530		5, 452, 530		5, 452, 530

Note: Estimation method is the Heckman Selection Model (maximum likelihood). SPSFreq is a count of the concerns raised normalized by the number of products (HS4) within an HS2 sector (results using these variables are reported in columns (1) to (4)). SPS denotes a dummy for the existence of a measure (against which a concern was raised) in the sector (results reported using this variable are reported in columns (5) to (8)). Controls include the log of the product of GDPs, the log of the product of populations, the log of distance, adjacency, common language and colonial heritage. Common religion is the selection variable in the first stage estimation. Importer, exporter, HS4 product, year fixed effects, and multilateral resistance (MR) terms à la Baier and Bergstrand (2009) are included in all regressions. Standard errors in parentheses. ***, * indicate a significance level of 1 and 10 per cent, respectively.

Source: Crivelli and Gröschl (2012).

E. International cooperation on non-tariff measures in a globalized world

The focus of this section is international cooperation on non-tariff measures (NTMs) and services measures. The section first reviews the economic rationale for such cooperation in the context of trade agreements. It then looks at the practice of cooperation in the areas of technical barriers to trade (TBT), sanitary and phytosanitary (SPS) measures and domestic regulation in services. The third part deals with the legal analysis of the treatment of NTMs in the GATT/WTO system and the interpretation of the rules that has emerged in recent international trade disputes. The section concludes with a discussion of the challenges of adapting the WTO to a world where NTMs are a growing concern.

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Some key facts and findings

- WTO rules help to deal with the problem of countries replacing tariffs with non-tariff measures, but the changing nature of trade creates new complexities that call for deeper forms of institutional integration.
- Countries cooperate on TBT/SPS measures and domestic regulation in services to address information problems and to complement market access commitments.
- Distinguishing legitimate NTMs from measures designed for protectionist purposes has been the key issue in GATT/WTO dispute settlement concerning NTMs and in establishing new disciplines for domestic regulation in services.
- The tension between economic analysis and legal practice can inform future efforts to address NTMs in the WTO system in an evolving trading environment.

This section begins by reviewing the economic reasons for international cooperation on non-tariff measures in the context of trade agreements. This theoretical approach provides a framework for considering the efficient design of rules on NTMs in a trade agreement and how they may be affected by diverse factors, such as the development of global production chains and the opaque nature of various NTMs. The second part looks at how cooperation on NTMs has taken place in the multilateral trading system and within other international fora and institutions. Specifically, the focus is on technical barriers to trade (TBT), sanitary and phytosanitary (SPS) measures (regarding food safety and animal and plant health) and services regulation, stressing the similarities and the peculiarities of the underlying problems and of the ways in which cooperation has taken place.

The third part of the section deals with the legal analysis of the treatment of non-tariff measures in the GATT/WTO system and the interpretation of the rules that have emerged in recent international trade disputes. Special attention is given to how the agreements and the dispute settlement system have dealt with the distinction between legitimate and protectionist NTMs. The section concludes with a discussion of the challenges of adapting the WTO to a world where non-tariff measures are a growing concern. This brings together the main insights of the preceding analysis of the theory, evidence and evolving practices of NTMs contained in the different sections of the Report, and offers some policy observations.

1. The regulation of NTMs in trade agreements

Why do countries cooperate on trade? Why is there a need for cooperation on non-tariff measures? How should NTMs be regulated in a trade agreement? This section anchors the discussion of international cooperation on NTMs in a theoretical framework. The following section provides a specific focus on three relevant policy areas: TBT measures, SPS measures and services measures, particularly with respect to domestic regulation.

Section E.1 first reviews the two main theories of trade agreements: the terms-of-trade approach and the commitment approach (see below). These theories provide a rationale for trade cooperation and offer a framework for considering the role and design of NTM regulation in a trade agreement, such as the WTO's agreements.

As discussed in more detail below, the terms-of-trade approach has a simple and powerful result. If governments set policy to meet their objectives in the most efficient way possible, they would not choose non-tariff measures to distort international trade in their favour. Tariffs would be the only policy instrument

involved. In this basic theoretical setting, governments set NTMs to address legitimate public policy concerns, and rules on NTMs in a trade agreement only need to address potential "policy substitution" between tariffs and non-tariff measures (see Section B). Efficiency can be obtained with a simple set of rules, such as national treatment and non-violation (see Section E.1(b) below). This set of rules leaves substantial autonomy to national governments in setting NTMs ("shallow" integration).

While certain features of trade agreements correspond to the basic prediction of the terms-of-trade approach, actual cooperation on non-tariff measures in the WTO and other arrangements (particularly preferential trade agreements) goes generally beyond a "shallow" level, encompassing "deep" forms of integration. This suggests that governments may be trying to address problems beyond substitution between tariffs and NTMs. What are these problems?

Section E.1 reviews some of these additional rationales for cooperation on non-tariff measures. A first explanation may be provided by the commitment approach. In that framework, it can be shown that certain features of WTO rules on NTMs can be justified when governments suffer credibility problems *vis-à-vis* domestic constituencies, such as special-interest groups. Another issue is that the changing nature of international trade and the rise in offshoring creates new policy externalities that may also prompt deeper forms of institutional integration beyond simple market preservation rules. Finally, cooperation on NTMs in trade agreements can be motivated by some additional complexities that are not captured by the basic model, but that may be relevant in practice. A first issue is that several NTMs are highly opaque. This suggests that member countries need to cooperate to identify what constitute an efficient and legitimate use of NTMs. Another issue is that market actors, rather than governments, can set *de facto* NTMs by adopting voluntary private standards.

Finally, this analysis turns to a consideration of the efficient design of a trade agreement that deals with non-tariff measures. Specifically, using the terms-of-trade approach as a benchmark, the last sub-section evaluates the efficiency of certain GATT/WTO principles. While this analysis is by necessity speculative, it may be useful to inform a discussion on institutional strengths and weaknesses. The section concludes with a discussion of the trade-offs implied by different forms of deep integration, such as harmonization of standards.

(a) Why do countries cooperate on NTMs?

Recent economic literature has developed two main economic theories regarding trade agreements: the terms-of-trade theory and the commitment theory. The ensuing discussion considers what each theory has to

say about the treatment of non-tariff measures in trade agreements. The terms-of-trade approach and the commitment approach argue that governments negotiate international treaties to address certain international and domestic externalities associated with trade policy. These effects were also touched upon in Section B. While the two economic theories were developed primarily for explaining the use of tariffs, similar motives might apply for cooperation on the use of NTMs.

The logic of the terms-of-trade and commitment approaches does not provide a satisfactory explanation of the economic rationale for services trade agreements. While some of the insights from these theories are relevant to explain certain features of the General Agreement on Trade in Services (GATS), economists recognize that there are important differences between trade in goods and trade in services. A discussion of the current debate on international cooperation on services trade is contained in Box E.1.

(i) *The terms-of-trade approach*

According to the terms-of-trade (or traditional) theory, governments are attracted to trade agreements as a means of escaping from a terms-of-trade driven Prisoners' Dilemma (Bagwell and Staiger, 1999, 2002), i.e. a non-cooperative situation in international trade policy. The "problem" that arises in the absence of a trade agreement can be expressed as follows.

When a government chooses the level of a tariff unilaterally, or a non-tariff measure that takes the place of a tariff, it will not consider the welfare consequences for foreign exporters in its decision. Section B describes how the incentive to use trade policy in ways that benefit domestic producers at the expense of foreign exporters causes governments to impose high trade restrictions that alter the terms of trade (i.e. the price of exports relative to imports) to the advantage of the domestic economy. However, as this logic applies to all countries and each one seeks to raise tariffs, the result – known as Nash equilibrium – is that the terms of trade are unaffected overall, but the volume of trade is inefficiently low. This outcome is the well-known Prisoners' Dilemma.

According to the terms-of-trade theory, the purpose of a trade agreement is to give foreign exporters a "voice" in the tariff choices of their trading partners, so that through negotiations they can make their trading partners responsive to the costs that these trade restrictions impose on foreign exporters. In accomplishing this, a trade agreement based on reciprocity and non-discrimination (the most-favoured nation – MFN – clause) naturally leads to lower tariffs and an expansion of market access to internationally efficient levels.

Governments can use non-tariff measures instead of tariffs to alter trading partners' market access and thereby manipulate the terms of trade (see Section B). This indicates that the principal design features of tariff agreements, reciprocity and MFN, can facilitate cooperation on NTMs. However, even in the context of a complex policy environment, there is no need for governments to negotiate directly over the levels of their NTMs. Rather, in the traditional approach, the main purpose of a trade agreement is to raise trade volumes without introducing distortions into the unilateral choices of NTMs, such as domestic regulatory and tax policies, as a result of the negotiated constraints on tariffs (Bagwell and Staiger, 2001; Staiger and Sykes, 2011). Intuitively, a tariff is the first-best instrument for manipulating the terms of trade: if governments have both tariffs and NTMs at their disposal, they have no reason to use the latter to restrict trade (Staiger, 2012).

The terms-of-trade theory of trade agreements provides strong support for "shallow" integration as the most direct means to solve the policy inefficiencies that would arise in the absence of a trade agreement. Negotiations over tariffs alone, coupled with a set of rules that address the policy substitution problem between tariffs and non-tariff measures (e.g. a "market access preservation rule"), can bring governments to a higher efficiency level (the efficiency frontier). At a conceptual level, this resonates with the approach of the General Agreement on Tariffs and Trade (GATT) to domestic NTMs, whereby negotiations focus on tariff reductions as a means to expand market access. Under this approach, various GATT provisions are meant to protect the value of negotiated market access agreements against erosion by NTMs. In addition, WTO members are required to forgo the use of quotas and other quantitative restrictions in favour of tariffs. This institutional solution allows WTO members to achieve the efficient combination of trade policy and domestic NTMs, even when governments face the incentive of using these measures to undo the market access granted to trading partners through tariff reductions (Bagwell and Staiger, 2001).

Notwithstanding this important result, two related questions remain open. Are there features of the treatment of non-tariff measures in trade agreements that the basic version of the terms-of-trade approach fails to explain? Why do governments often cooperate specifically on NTMs in the context of trade agreements? These questions are addressed in two steps. First, we introduce an alternative rationale for trade agreements, the commitment approach, and argue that the treatment of NTMs in treaties may respond to the need to "buy" credible commitments to efficient policies. In the following sub-section, we discuss additional concerns relating to cooperation on NTMs that are not captured by the basic version of the terms-of-trade approach discussed above.

Box E.1: Economic theories of the GATS

Economic analysis of the GATS tends either to emphasize the economic advantages of efficient and liberalized services markets or to use the theories borrowed from trade in goods to explore the logic of services trade opening. While these approaches have gone some way towards exploring the role of services trade in the broader economy and identifying the parallels between trade in goods and trade in services, neither approach speaks directly to the question of international cooperation on services.

This box first outlines the reasons why the frameworks laid out in Section E.1 are unsatisfactory for cooperation in services, and summarizes two approaches to explaining international cooperation on services trade. The first argues that services commitments in international trade agreements provide a credible instrument for anchoring unilateral policy reforms and limiting policy substitution. The second sees the process of services trade opening as part of government responses to changes in the nature of production towards international supply chains.

The principal argument for applying theories developed for trade policy cooperation in goods to services trade is the recognition that policy-makers can suffer from the same incentive problems in both sectors. In particular, the international terms-of-trade theory and the domestic commitment theory may extend to services measures (Copeland and Mattoo, 2008). However, the distinctive features of services may mean that the theories used to explain the GATT may not be sufficient to explain cooperation under the GATS. For example, one of the main modes of services provision is through local establishment or foreign direct investment. This mitigates the incentive to manipulate international terms of trade because with vertical integration, international firms partially internalize the foreign costs of trade policy (Blanchard, 2007). In addition, Marchetti and Mavroidis (2011) suggest that the GATS is flexible to the point that it is hard to argue persuasively that commitment theory explains its advent.

Copeland and Mattoo (2008) point to another challenge of applying the terms-of-trade and commitment theories to trade agreements in services. Services play an important role in the broader economy by complementing outcomes in other markets. For example, a well-functioning financial sector transforms savings into investment and can allocate capital towards higher returns. Transport services reduce the frictions in exchange, facilitating both domestic and international trade. Finally, communications technology does not just facilitate transactions but may lead to the dissemination and creation of knowledge (Copeland and Mattoo, 2008). These potential efficiency gains would motivate a government to open up services markets unilaterally, without the need for international cooperation or a services agreement.

In addition to unilateral incentives to open up services markets, technological changes have led to an expansion in services trade, which itself leads governments to seek multilateral commitments. According to Marchetti and Mavroidis (2011), some countries worried that while the opening of service markets was progressing through the 1980s, barriers loomed on the horizon. Specifically, the concern was that services trade that was enabled by technological change would lead governments to replace the lost technological barriers with new policy barriers to services trade, akin to policy substitution discussed with regards to goods. The threat of policy substitution led these countries to advocate a mechanism to open international services trade, including the GATS.

On the other hand, Hoekman and Kostecki (2001) argue that changes in the fragmentation of the production led firms to require more access to efficient services inputs, which in turn encouraged governments to put services trade opening on the agenda. Similarly, Deardorff (2001) finds that because services play an important role in facilitating international production, opening trade in services increases the returns to trade opening in goods. Because global production chains play an important role in international trade, enacting protectionist policies in services and investment may end up restricting trade in goods. Recent work on the effects associated with international production (discussed in Section E.1(b)) may therefore provide useful insights.

In brief, current economic theories of the GATS provide only a partial picture of the complex world of services negotiations. This is somehow in contrast to the more developed framework that economists use to analyse international cooperation on trade in goods. This is an area where more economic research would have important pay-offs.

(ii) The commitment approach

Thus far, we have described a theory of trade agreements that emphasizes the control of the beggar-thy-neighbour motives associated with terms-of-trade manipulation. A distinct, though possibly complementary, theory of trade agreements posits that the purpose of a trade agreement is to tie the hands of its member governments, and thereby offer an external commitment device. Governments might benefit from a trade agreement that could help them commit to a policy of open trade as tariffs benefit the protected sector, but create distortions that lower aggregate welfare (see Maggi and Rodríguez-Clare, 1998, 2007; Matsuyama, 1990; Staiger and Tabellini, 1987).¹

Most research adopting the commitment approach to trade agreements has focused on tariffs only, and the implications of the commitment approach for the treatment of non-tariff measures in trade agreements is less well understood than in the case of the terms-of-trade theory. Two recent papers, however, use the commitment approach to offer insights into features of the treatment of NTMs in the GATT/WTO system that cannot be understood through the terms-of-trade approach. Brou and Ruta (2009) show that an agreement that allows tariffs to be constrained, but leaves other NTMs such as domestic subsidies unbound or open to manipulation, will not provide an effective commitment device. This would allow policy-makers to simply use NTMs more intensively once tariff bindings (i.e. ceilings) have been negotiated (a clear example of policy substitution). In this context, a government is better off under an agreement that imposes rules on NTMs because only under a more complete trade agreement can policy credibility be achieved. This approach, therefore, provides insights into policy prerequisites for handling domestic NTMs, such as domestic subsidies or regulations, in the WTO system.

In a similar modelling environment, Potipiti (2006) offers an explanation for the different treatment of tariffs and export subsidies in the WTO. Both tariffs and export subsidies may distort the allocation of investment, which generates a social welfare loss. On the other hand, the government may benefit from the lobbying contributions from the protected import and export sectors. The rules that the policy-maker will chose to sign in a trade treaty reflect this trade-off. Potipiti (2006) shows that, because of the different growth perspectives of the import and the export sectors, a government finds it efficient to commit to different rules on export and import policy. Specifically, a higher growth prospect of the export sector relative to the import sector makes lobbying contributions from exporters less attractive, while increasing the social cost of export subsidy. Hence, WTO rules that ban the latter but only limit the use of tariffs, which is difficult to explain in the terms-of-trade approach, can be understood from the perspective of the commitment theory.

(b) Why do countries cooperate on NTMs? Beyond policy substitution

The previous section emphasized the similarities between tariffs and non-tariff measures and argued that NTMs can be used by governments to take the place of tariffs. This provided a first rationale for the regulation of non-tariff measures in trade agreements. The replacement of tariffs with NTMs, however, is not the only problem that the regulation of NTMs in trade agreements attempts to address. This section focuses on these additional concerns.

Non-tariff measures differ from tariffs in several ways; these differences and the changing nature of international trade may provide additional reasons for cooperation on non-tariff measures within trade agreements. NTMs often address vital domestic and international public policy concerns. They may be directed at protecting broad consumer interests more than narrow producer concerns. Protecting plant, animal and human health, food safety, and the environment, or establishing the standards necessary for fair market exchange are public policy objectives. These objectives, while broadly shared by WTO members, often present a wide spectrum of policy preferences. In addition, non-tariff measures and tariffs are different in terms of their longevity. NTMs are subject to change because regulatory needs vary in line with changes in the economic and social environment. What is the role of the WTO in this context?

This section provides two sets of reasons for incorporating disciplines on non-tariff measures into the trade system beyond the disciplines necessary to prevent policy substitution between tariffs and NTMs (the next section offers specific examples based on TBT/SPS measures and services measures).

The first explanation focuses on the differences between tariffs and non-tariff measures and the rationale for the regulation of NTMs that relate to these differences. From this point of view, there are three additional concerns in the regulation of NTMs. The first is the opacity of certain NTMs in terms of intent and effect. Secondly, NTMs and tariffs affect competition in different ways, as an NTM regulation may increase fixed costs and therefore deter market entry. Finally, not all NTMs are imposed by governments, and may take the form of private standards.

The second explanation concerns the changing nature of international trade. The rise in global production chains may create new forms of policy spillovers that also require direct cooperation on non-tariff measures. The toolbox to deal with NTMs also depends on whether the problem that the trade agreement is trying to solve is tariffs being replaced by NTMs or these additional dimensions of cooperation. This issue is addressed in Section E.1(c).

(i) Opaque instruments

Sections B and C document the rise in the use of non-tariff measures. As concerns about food safety, financial stability and environmental issues increase, governments will rely more on NTMs to achieve domestic policy objectives. The wider use of NTMs, along with the complexity and opacity of several non-tariff measures, pose three new and related challenges for domestic regulators and international trade negotiators. First, there can be uncertainty on what constitutes the efficient level of a non-tariff measure. Secondly, cooperation on NTMs can suffer because enforcement of agreements requires observing the compliance of each government, whereas some NTMs are not easily observable. Finally, if NTMs are opaque, they may be only of limited use as a mechanism for securing commitments by governments under an international agreement.

Shallow integration is efficient in a setting where there are no information problems, as shown in the work by Bagwell and Staiger (2001). However, the lack of perfect information can itself be a reason for deeper cooperation on non-tariff measures in trade agreements. Specifically, the complexity of NTMs can create inefficiencies even if governments are perfectly informed about their own regulatory needs and the effects of their own policy choices, but do not know the efficient level of NTMs for their trading partners. This is because governments may mislead their partners about their policy intentions, making even mutually beneficial communication difficult. This information asymmetry (i.e. where one party has more or better information than the other) poses problems for many areas of international cooperation, but is particularly important in the context of domestic regulation, as disagreement over public policy goals can mask fundamentally uncooperative behaviour.

In addition, the efficient level of a non-tariff measure may change over time. For instance, regulatory targets depend on factors such as the state of technology, awareness of the effects of market failures, industry practices and societal needs (see Section B). When new situations arise, either governments remain unconstrained by their international commitments or they may seek new regulatory provisions by renegotiating their trade agreements with their partners.

Updating commitments to reflect the new regulatory needs may affect the agreement's existing balance. For example, suppose two governments come to an agreement on health and environment inspection certificates for dairy product imports and chicken exports. If there is a discovery of a new pollutant in cheese products that is not covered in the agreement, the dairy-consuming state may seek to impose regulations not covered in the inspection agreement. If the dairy producer seeks to renegotiate, they do so having already made concessions on chicken exports. In expectation of renegotiation, both governments may

seek to avoid efficient agreements for fear that their position would be eroded. Without some mechanism to address these new contingencies, governments' inability to put all future contingencies into a contract precludes writing an efficient agreement for the long run (Battigalli and Maggi, 2003).²

Another concern is that the opacity of non-tariff measures often makes it difficult to enforce agreements. A government can theoretically threaten to withhold future cooperation if a partner reneges on a deal. This threat, however, depends on the ability of each government to observe how the other is respecting the agreement. In the case of trade, this requires monitoring of the level of market access. While laws are generally published for the public, the actual application of the law may be opaque and vary according to the choices of regulatory agencies and prevailing economic conditions.

In an uncertain economic environment, governments may have difficulty distinguishing whether a drop in imports is due to higher productivity of the import-competing sector or due to help from the government through hidden protection (Bajona and Ederington, 2009). This makes enforcement challenging; retaliation may be triggered without cause, or agreement violations may go unpunished. Moreover, the potential for mistaken retaliatory actions may make parties hesitant to agree to more liberal commitments, thus harming the prospects for international cooperation.

The opacity intrinsic to the application of non-tariff measures and the challenge of identifying their effects may also exacerbate commitment problems between governments and domestic investors. Trade agreements are generally thought to help governments make policy commitments to investors and voters. However, international agreements may lose their binding power if domestic actors are unclear about policy choices. Firms must decide to make costly and irreversible investments in order to sell new goods or enter new markets. Uncertainty over trade policy creates an incentive for firms to wait and evaluate the effects of regulations before investing. This delay reduces the positive effects of trade opening and reduces the commitment effects of a trade agreement.

Handley (2011) finds that uncertainty over the application of trade policy in Australia reduced the level of firm market entry after trade opening by 30 per cent. In a related study, Handley and Limao (2011) show that uncertainty over trade policy significantly suppressed Portuguese firms' access to EC markets prior to the accession of Portugal in 1986. These results indicate that the complexity and opacity of non-tariff measures may limit the efficacy of trade agreements in solving commitment problems.

(ii) Private standards

The majority of this report focuses on measures imposed by governments to address behaviour by

private actors in the market, but the emphasis on government policy somewhat obscures the capacity for collective action on the part of non-governmental agents. Private standards adopted by economic agents can serve as non-tariff measures, affecting trade and world welfare in the same way as government measures (Robert E. Baldwin, 1970). Therefore, the same type of problems that characterize the use of NTMs, and that have been discussed so far, may arise for private standards. To address these impacts, governments can sign trade agreements in which they commit to regulate private standards and standard-setters. Box E.2 provides examples of commonly used private standards. This sub-section evaluates the conditions under which governments would develop trade agreements that cover private standards in various market conditions.

When trade is in final goods and standards remain voluntary, private standards primarily address market failures. Section B describes conditions under which these standards can serve as a signal to the market regarding the particular characteristics of the product. Such voluntary standards can enhance trade by allowing firms to establish systems that provide consumers with information about their products without the need for a trade agreement. Consider an economy with a single standard that opens up trade. Even without government intervention, coalitions of firms may alter standards to match the needs of different consumers in each market. Trade opening may produce harmonization “from the bottom” (initiated by private industry groups) that avoids wasteful replication of national standards and a larger number of specialized international-standard groups (Casella, 2001).

Box E.2: Examples of private standards

Private voluntary standards are developed by a number of different types of entities, including companies, non-governmental standardizing bodies (including regional or international bodies), certification and/or labelling schemes (e.g. the Forest Stewardship Council and the Marine Stewardship Council schemes), sectoral trade associations (Florverde for flowers; the Better Cotton Initiative for cotton), and other non-governmental organizations. Some bodies may be both sectoral in nature (e.g. covering forestry products) and international.³ Among the very many examples of private voluntary standards, we consider the three areas described below for illustrative purposes.

Forests and certification

The Forest Stewardship Council (FSC), established in 1993 as a response to concerns about deforestation, is an international non-profit organization aimed at providing forest management certification.⁴ The FSC has ten principles and associated criteria for responsible forest management; these describe, among other things, how forests have to be managed to meet social, economic, ecological and cultural needs – they include managerial aspects as well as environmental and social requirements.⁵ Another example is the Programme for the Endorsement of Forest Certification (PEFC), an umbrella organization that has endorsed some 30 national forestry certification systems.

These two organizations represent the largest standard schemes in terms of certified forest area, with some 15 per cent of the world's productive forests. Apart from forest management certification, standard schemes in the area of forestry commonly offer chain-of-custody certification to manufacturers and traders who do not grow and harvest trees. This type of certification is based on requirements to ensure that the wood contained in products originates from certified forests. Chain-of-custody certifications have risen rapidly in recent years, reflecting growing consumer demand.⁶

Carbon labelling

Carbon footprint labelling schemes and their related standards aim to reflect the total amount of greenhouse gases emitted during a product's lifecycle, including its production, transportation, sale, use and disposal. Existing initiatives differ in rationale, context, information display, and assessment methodology. While some labelling schemes indicate the amount of carbon emitted during a product's lifecycle, others mention that the producer has committed to reducing or offsetting its carbon footprint, or that the product is more carbon-efficient than a comparable product.

The first carbon-labelling initiative was launched in 2007 by the Carbon Trust, an independent, not-for-profit company created by the UK government; it was followed by several other initiatives. Efforts to harmonize the underlying methodology of carbon footprint labelling schemes are on-going at the international level.⁷ An increasing number of governments have adopted, or are in the process of developing, carbon-labelling schemes. To date, however, these are all voluntary in nature (Brenton et al., 2009; Bolwig and Gibbon, 2009).

Food safety standards

In response to evolving economic conditions, including increased consumer demand for quality, safety and process attributes and increased concentration in the agro-food retail sector, private firms have been developing a growing number of food safety standards (Henson and Reardon, 2005). These standards are typically higher than public mandatory standards and are integral to the contracting obligations of firms along a supply chain.

Private standards can contribute to the governance of food safety across regions and sectors but when there is a multitude of competing standards, compliance costs for suppliers also increase (Fulponi, 2006). Thus, another recent trend in the area of private food safety standards is the emergence of global coalitions for setting standards. These coalitions represent an attempt to harmonize efforts to achieve food safety and mutual recognition of national and/or regional standards among food retailers. For example, the Global Food Safety Initiative (GFSI) was launched in 2000 to encourage convergence between food safety management systems through maintaining a benchmarking process for such systems.

Through the benchmarking process, the GFSI seeks to identify food safety schemes that produce consistent food safety results. Retailers guided by GFSI recommendations should be able to identify suppliers that meet the requirements of relevant standards without requiring an audit. This type of initiative could provide retailers with flexibility to source across the world and contribute to enhanced efficiency of the global food system.

On the other hand, once production expands beyond borders, governance between and within firms requires increased coordination and monitoring. In this environment, firms increasingly employ private standards to address these challenges in governing their supply chains, with implications for market access. For example, in a world of local production, private food safety and quality standards were predominantly business-to-business requirements and not a significant challenge to trade, but with the rise of offshoring, these private standards have evolved into collective standards as leading firms have made efforts to manage the transaction costs associated with their global supply chains (Henson, 2008). As these supply chains have begun to span national borders, private standards have become increasingly prevalent (Hussey and Kenyon, 2011).

The establishment and adoption of a private standard entails costs that have different effects across firms and countries. For example, the global adoption of a standard used in the domestic market entails costs for foreign firms that domestic counterparts do not face (Büthe and Mattli, 2011). When private standards have distributional consequences, governments may use trade agreements to limit the negative trade consequences of international and domestic standard-setting bodies.

Even without a trade agreement, firms may limit the influence of a particular standard by creating a competing private regulator to develop more favourable rules. For example, the World Wide Fund for Nature helped create a private standard-setting body, the Forest Stewardship Council (FSC) to promote sustainable forestry. In response, producers developed competing standard-setting programmes to satisfy consumers without undertaking the costly measures promoted by the FSC (Cashore, 2002).

Depending on the needs of citizens and firms, governments may sign agreements to promote or constrain competition among standard-setting bodies. Such an agreement can significantly alter the regulatory environment. For instance, Büthe (2010) points out that in the electronics sector, the International Electrotechnical Commission (IEC) managed to leverage WTO recognition and its own incumbent position to play a central role in international regulation. Besides this example, the experience of the European Union shows that the designation or subsequent recognition of a particular private rule-maker affected competition (Cafaggi and Janczuk, 2010).

Moreover, a "private" standard that becomes widely used may be a precursor to government regulation (whether in the form of a technical regulation, conformity assessment procedure or an SPS measure). One recent example, relevant to the issue of carbon footprint labelling, is France's Grenelle 2 Law.⁸ This law includes provisions on product carbon footprint labelling and environmental lifecycle analysis. Some delegations at the WTO have expressed concern (in the TBT Committee) that carbon-labelling requirements could become mandatory in the future; in fact, an earlier draft of the measure had foreseen mandatory carbon footprint labelling. The European Union has clarified that the law is not compulsory: it was designed to introduce consumers to additional environmental information provided on products.

The analysis above examines voluntary standard-setting and the role of agreements in regulating standard-setting bodies when production is localized in a single country. However, when production networks are global and tasks are traded across countries, firms may set standards for their input suppliers, establishing an additional reason for

international agreements on voluntary standards. As mentioned above, firms choose standards to ensure a level of quality or to make the input compatible with other stages of the production process, often requiring input manufacturers to purchase or license standards from private firms. However, in industries with only a few input purchasers, these firms may be able to set standards in ways that leverage their market power.

For example, suppose that a number of firms produce oranges for sale to one large orange juice manufacturer. The manufacturer can set standards in a way that extract profits from the orange farmers, for example by requiring oranges selected by a patented orange-grading machine, or that orange growers obtain a licensed management certification. If the firm is vertically integrated, the standard can be set to ensure that profits remain in house, effectively shutting out competition for the input. Imperfect competition creates conditions under which governments can profitably sign agreements to limit the extent to which private standards affect trade. If the standard-setter is in a different country than the input suppliers, the use of that private standard could inefficiently decrease trade. In this environment, the government of the input suppliers would prefer to limit the ability for the downstream firm to set standards.

Because both incumbent firms and their governments have an incentive to influence private standards so that they can capture markets at the expense of competing firms and economies, reciprocal negotiation of private standardizing organization regulations may improve efficiency. However, while there are significant potential welfare gains for improving market access for non-incumbent firms, foreign exporters and their respective governments, each of whom lack influence in private standard-setting, these gains may come at the expense of some domestic regulatory interests. For example, while some governments require private standardizing bodies to include consumer representatives in the development of a standard, in an international cooperative environment, consumer interests would compete with foreign firms or governments whose interests are to open markets.

In many cases, market access considerations are not aligned with consumer concerns, such as environmental and safety protection. Moreover, because producer interests generally face lower collective action costs, they tend to be more politically organized than diffuse consumer interests. Because of these political forces, it is possible that international cooperation on private standard-setting may affect the representation of consumer interests in the development and goals of standards.

(iii) Compatibility standards, technical regulations and fixed costs

As discussed in Section B, several non-tariff measures may differ from tariffs in their effects in imperfectly

competitive markets. This sub-section argues that governments may cooperate to limit the strategic competitive effects of NTMs under three different market conditions. Specifically, a rationale for NTM cooperation emerges in markets with horizontally differentiated goods and services, when products exhibit quality differences, and when NTMs create fixed costs that alter firm entry and industry composition.

When goods and services are not consumed in isolation and there are differences in compatibility across types of products, it may be necessary to set up rules to reduce unnecessary conflicts between formats. In perfectly competitive markets, goods and services are assumed to be economically identical, but in many markets consumers exhibit preferences for one or another variety of goods. These consumer preferences induce firms to alter the features of their product to distinguish it from those of competitors, producing what the economic literature calls horizontally differentiated products.

Moreover, each variety can exhibit higher or lower levels of compatibility with complementary products in the market. To encourage compatibility across products, firms and occasionally governments may appeal to a compatibility standard. Because these standards can affect trade, international cooperation on such standards can promote both market efficiency and consumer welfare (World Trade Organization (WTO), 2005b). For example, while there may be no objective quality differences between two possible computer ports, one of the two may interface better with a popular portable music device. A compatibility standard would ensure that the port set-up increases the compatibility with the other devices available on the market. International cooperation on that standard can ensure that foreign devices do not need to be refitted to meet local demand specifications.

One consideration to bear in mind is that while compatibility standards improve welfare, the beneficiary of this policy reform may depend on who sets the standard. To the extent that promoters of competing standards can come from different countries and the winner can claim profits from the adoption of its standard, strategic trade policy considerations can come into play (World Trade Organization (WTO), 2005b). Governments may refrain from eliminating certain non-tariff measures in an effort to promote the standards adopted by their domestic firms. However, when production involves purchasing parts from foreign affiliates or unrelated parties, promoting standards reduces search costs and production costs. As production becomes increasingly reliant on global production chains, the need for deeper policy integration becomes more pressing, lowering the attractiveness of strategic standard-setting.

A second rationale for cooperation over non-tariff measures is the need to address governments' strategic behaviour in setting these measures. For example, in markets with quality differentiation, consumers take the quality of a product into account when making purchasing decisions. If consumers can observe quality, economic theory indicates that firms that produce a good of higher quality replace the previous vintage of goods on the market, taking market share from competing firms' product lines. In the short run, the technology leader can behave as a monopolist, raising prices and profits, but not raising the price so high as to allow competitors to enter. Lagging firms would have to overcome the costs of innovation as well as the monopolist's prices to sell any products (Motta et al., 1997). This process generates a ladder effect, with each new incumbent selling a higher-quality good at a high price and all other firms exiting, a phenomenon Schumpeter termed "Creative Destruction".

The main danger in such a scenario is that governments may strategically adopt technical regulations to favour domestic firms.⁹ Whatever firm ends up producing, the higher-quality good receives higher profits, benefiting the host country and government (Lehmann-Grube, 1997). This potential advantage has important implications for domestic welfare, and creates powerful incentives for lagging industries as well as their national governments to set policies that allow domestic firms to leapfrog leading firms and take over the market in high-quality goods (Herguera and Lutz, 1998). Boccard and Wauthy (2005) describe how governments may use non-tariff measures in this process to ensure that the domestic firm comes out as the quality leader. For example, a technical measure that has the effect of restricting the quantity of imports may allow the domestic firm to develop products in the high-quality range while forcing the foreign firm to produce lower-quality products. Because the foreign firm loses its leadership status, the advantages of "leapfrogging" come at the cost of lowering foreign profits. Because both governments face this incentive, each may seek to mutually tie their hands to avoid this sort of competition by entering into an international agreement on NTMs.

A third rationale for cooperation on non-tariff measures relates to the fact that these measures create a fixed cost for the entry of foreign firms (see Sections B and D). The above discussion assumes that technology or some other factor causes imperfect competition, but NTMs can also determine the extent of competition. Every firm that enters a foreign market would have to file paperwork, familiarize itself with customs procedures, and pay licensing fees, thus incurring fixed costs of doing business rather than a per unit charge. While adding fixed costs affects the international terms of trade in the same way as a tariff, NTMs would have an additional effect on market entry decisions in the foreign country. The larger the NTM, the more firms will have to be able to produce to

engage in trade. If firms are not identical and NTMs impose fixed costs, trade will be concentrated in larger and more productive firms, while at the same time increasing the number of small, less productive firms (Nocke and Yeaple, 2008).

Countries have several reasons to cooperate on reducing fixed costs of market entry. For instance, governments may limit non-tariff measures to prevent the over-reliance of the domestic economy on a few large firms that are able to overcome the fixed costs. Policy-makers may be wary of the effects of economic shocks, which can propagate faster and be more difficult to absorb when there are too few large firms. In particular, if an industry is highly concentrated, capital misallocations that would be reduced in a more competitive market may reverberate, increasing the frequency and cost of economic shocks. These effects would not only depend on regulations in the goods sector; as discussed in Section E.4(e), pro-competitive regulation in the context of domestic regulation in services is an important area of active cooperation.

(iv) Offshoring

The proliferation of global production chains increases international interdependency and may provide a rationale for deep cooperation on non-tariff measures within trade agreements. As discussed in Section E.1(a), theories of international trade until recently identified one main international spillover associated with trade policy: how it affects terms of trade. The break-up of the production process across different countries creates new forms of cross-border policy spillovers. Antràs and Staiger (2008), for instance, build a model where prices are determined by bilateral bargaining because international production involves exclusive contracts with input suppliers. In this environment, the gains from trade are divided between the two or more firms involved, and the prices of traded goods and services reflect the relative contribution of each node of the supply chain. Because production is international, some of the costs of trade frictions are borne by firms in foreign states. An international externality occurs because governments do not take into account the full value of the international production chain, but only of its domestic component.

Specifically, when prices are set by bargaining, the input producers experience rent-shifting (i.e. shifting profits from the input supplier to the domestic producer), while downstream products experience the traditional terms-of-trade effects. To address the new concern, a trade agreement should ensure that trade policies over the later stages of production do not distort bargaining between producers and input suppliers. When prices are set in a competitive market, it is sufficient for an input-exporting country to negotiate over the tariff directly tied to the input product. However if prices are set via bargaining, in addition to obtaining market access, or a lower tariff

on the imports of the input, governments must additionally negotiate the tariffs and domestic policies which affect the *final product*. For example, suppose country A is seeking to export auto parts to country B. Country A's interest is no longer only to seek reductions in tariffs on auto parts, but also the domestic regulations and standards in country B for the sale of completed automobiles. Without such a commitment, country B may inefficiently regulate, tax or protect the final good market, knowing that part of the pain is suffered by auto parts manufacturers in country A. With a rise in offshoring, these deeper commitments may become increasingly important.

The internationalization of production exemplifies why the traditional trade opening toolbox (i.e. tariff reductions) fails to offer a satisfactory solution in the case of non-tariff measures. Consider the concept of reciprocity. In the current system, this principle is intended as reciprocal market access opening for final goods. It is not hard to see why this concept fails to provide a useful guiding principle for trade negotiators in the context of non-tariff measures and global value chains. More broadly, existing trade rules were originally drafted for a world of international trade in final goods. The extent to which this institutional framework can address the new forms of interdependency associated with global production networks is a complex matter. This issue is discussed in Section E.4.

(c) Different approaches to the regulation of NTMs in trade agreements

This section reviews the recent economic literature on the design of disciplines on non-tariff measures. First, it argues that shallow integration can ensure that governments have the ability to efficiently employ NTMs, so long as they do not replace bound tariffs with non-tariff measures. In particular, the section examines two rules that enable the legitimate use of NTMs – national treatment and non-violation provisions – and highlights their institutional strengths and weaknesses. These rules rely on well-informed governments, which is at odds with the complexity and opacity of many NTMs. In light of this, the role of disciplines to improve transparency in trade agreements is discussed.

Secondly, the section maintains that the differences between non-tariff measures and tariffs require a new set of institutional tools that go beyond shallow integration. Specifically, we review the literature on deep integration and discuss the trade-offs implied by mutual recognition of domestic regulatory requirements, the joint negotiation of tariff and non-tariff measures in trade agreements, and the harmonization of NTMs at the multilateral and regional level.

(i) *Shallow integration*

Shallow agreements are those that directly regulate tariffs and other border measures, but stop short of

intervening in domestic measures beyond the requirement of non-discrimination of foreign goods and services. As seen in previous sections, the fundamental goal of a shallow trade agreement is to guard against the possibility that governments may replace policy measures explicitly bound in a schedule of commitments with unconstrained policy in order to discriminate against their trade partners. In the following, we discuss two rules which aim at limiting this sort of non-cooperative behaviour, assuming perfectly informed governments. When governments are not perfectly informed, there is a role for transparency provisions which will be taken up further in Section E.2 as well as in Section E.4.

National treatment

According to economists, trade agreements are incomplete contracts. By this, it is meant that no trade agreement can possibly cover the myriad ways that governments may wish to regulate economic life and, therefore, agreements have gaps. However, if not bound by agreement, governments may be tempted to set non-tariff measures without regard to the implications for foreign market access. This poses an obvious challenge in the design of trade treaties. Adding specific provisions to the agreement may partially address some of its gaps, but each new rule adds to the complexity and enforcement costs of the agreement. For this reason, trade treaties sometimes include explicit and rigid limitations on NTMs (Battigalli and Maggi, 2003). Horn et al. (2010) show that simple and broad rules, even if occasionally inappropriate in certain circumstances, may generally be more efficient.

One of the principal constraints on discrimination via non-tariff measures is the obligation to treat foreign products at least as favorably as “like” domestic products. This obligation for national treatment appears in Article III of the General Agreement on Tariffs and Trade (GATT), Article 2.1 of the TBT Agreement, is implied in Article XVII of the General Agreement on Trade in Services (GATS) as well as Article 3 in the Trade-related Aspects of Intellectual Property Rights (TRIPS) Agreement.¹⁰

Agreements including national treatment obligations limit the use of internal measures that affect the economic conditions of imported products. National treatment requires that any internal tax or regulation must not discriminate between domestic and foreign sources of supply and is therefore deemed not to be protectionist. Suppose that a country wanted to use a health warning label to limit the import of foreign paint, increasing the sales of domestic paint manufacturers. A national treatment provision requires that the label on foreign products would have to be applied to domestic products as well. Because the label would no longer distribute competitive benefits, the government may be dissuaded from using the health measure for protectionist reasons. As a result, only tariffs are left

to restrict trade, and under the most-favoured nation (MFN) clause, those tariffs must be non-discriminatory.

While national treatment limits the use of non-tariff measures for discriminatory purposes, some authors have argued that in certain cases the rule can be too blunt to meet the legitimate policy objective of countries.¹¹ Horn (2006) describes ways in which national treatment can be insufficient to limit the protectionist use of NTMs (in this case a Pigouvian domestic tax). First, a national treatment provision is only effective when there is a “like” domestic product. If there are no domestic paint manufacturers, the government will not be in violation of national treatment whatever the motives or severity of the NTM, despite the fact that such NTMs would still confer an advantage to a country’s terms of trade.

Secondly, when a negative externality is associated with the consumption of a foreign product – for instance, if foreign paints are more harmful to human health than the domestically produced ones, and yet are “like” products from the perspective of the rule – a national treatment provision constrains the government’s ability to limit the scope of a costly regulation to just the goods that produce the externality.¹² This limitation on regulation requires trade negotiators to set their tariff commitments carefully. Note, however, that while national treatment rules set a blanket requirement that may constrain regulatory authority, rigid rules decrease contracting costs and may facilitate agreements in uncertain regulatory environments (Horn et al., 2010).

Recent research has suggested that the WTO’s dispute settlement mechanism can lower the costs of using rigid national treatment rules while still addressing potential policy substitution by WTO members. Battigalli and Maggi (2003) characterize the work of the WTO panels and Appellate Body as providing arbitration that improves the efficiency of previously bargained agreements when the explicit terms of the agreement are insufficient. The authors argue that, while panellists and Appellate Body members may be less informed about the optimal obligations of member states than the members themselves, the presence of an arbitrator corrects the misuse of a non-tariff measure caused by the rigid application of a national treatment rule.

For example, suppose that governments negotiated market access while assuming that all computer monitors have equal, and environmentally acceptable, amounts of mercury. If foreign production of computer monitors switches to a more mercury-intensive manufacturing process, a rigidly applied national treatment provision may not allow governments to respond to the change. Because each WTO member can have recourse to dispute settlement, governments can efficiently fulfil the obligations of the agreement on the new product while maintaining national treatment.

So far, it has been assumed that the mechanism through which WTO panels and the Appellate Body improve the efficiency of trade agreements when national treatment is too rigid or incomplete has not been analysed. However, what practical role do WTO panels and the Appellate Body play in reaching a jointly efficient outcome?

Maggi and Staiger (2011) argue that the dispute settlement mechanism can play an important role in the interpretation of trade agreements when the rules are incomplete and it is difficult to write efficient agreements. The authors consider a variety of potential roles of WTO panels and the Appellate Body that range from fairly conservative, applying the existing obligations to ensure enforcement, to more “activist”, in which they may fill gaps in the obligations of WTO members, or even going as far as to modify existing obligations. The authors evaluate the ideal scope and specificity of the rules embodied in trade agreements, such as national treatment, under each of these hypothetical degrees of court involvement. They find that more flexible disciplines are preferable to rigid rules when it is difficult for WTO panels and the Appellate Body to correctly identify the efficient policy.

Non-violation

The framers of the GATT sought to assuage fears that contracting parties might act in ways that, while not in violation of the agreement, could undermine commitments made in the course of negotiations. Article XXIII of the GATT and Article XXIII:3 of the GATS permit governments to seek dispute settlement through a “non-violation” complaint. Such a complaint is allowed if one government can show that it has been deprived of an expected benefit because of another government’s action, or because of any other situation that exists. The aim is to help preserve the balance of benefits struck during multilateral negotiations. For example, a country may have agreed to reduce its tariff on a product as part of a market access deal, but later altered its regulatory stance so that the effect on the conditions of competition are the same as the original tariff. A non-violation case against this country would be allowed to restore the conditions of competition implied in the original deal. This sub-section illustrates how non-violation complaints address the problem of tariffs being replaced by NTMs and the limitations of this approach.

As described in Section B, in a setting where the only cross-border spillover of a policy is how it affects terms of trade and where there are no institutions to facilitate international cooperation, governments would efficiently regulate the domestic market but would have an incentive to set inefficiently high trade restrictions (Bagwell and Staiger, 2001). The reason for this is that the only inefficiency associated with unilateral policy choices derives from the desire to obtain a terms-of-trade gain at the expense of trading partners. Because the externality

addressed by the domestic regulation does not affect the welfare of foreign citizens, the government has no incentive to under- (or over-) regulate from a global welfare perspective.

On the contrary, when tariffs are committed in a trade agreement, governments may be tempted to inefficiently use domestic regulatory policy to affect the terms of trade, altering non-tariff measures to take the place of tariff measures. In this context, Bagwell and Staiger (2001) show that the existence of a non-violation rule in a trade agreement discourages policy substitution. Specifically, in the presence of a non-violation remedy, governments understand that they risk a legal challenge if they manipulate their regulations for protectionist purposes after agreeing to a tariff binding. If a government does need to alter its regulation to address a new domestic market failure, the non-violation rule allows that government to lower its tariff to compensate trading partners for any trade-restrictive effect of the new measure.

A separate issue is the extent to which the economic view of the non-violation rule is reflected in the practice of the GATT/WTO system. For instance, Staiger and Sykes (2011) argue that non-violation claims are unlikely to be used to limit non-discriminatory regulations even if they distort trade. The three successful cases of non-violation claims address discriminatory border measures. According to the authors, under the *Japan – Film* panel's interpretation of the non-violation rules, discrimination is a prerequisite for a claim, which prevents the use of non-violation claims to address many of the regulatory balance concerns described above. This interpretation would suggest that non-discriminatory changes in regulatory policy appear to fall outside the scope of the GATT, a subject discussed in more detail in Section E.3 and E.4.

Another issue, which was discussed in the World Trade Report 2010 (World Trade Organization (WTO), 2010), is whether the non-violation doctrine could be extended to cover other situations where the use of non-tariff measures grants more (and not less) market access to trading partners. Under these circumstances, should governments be allowed to adjust (bound) tariffs upwards once regulatory needs have changed? If such a possibility is not allowed, it could be argued that governments may hesitate to enact efficient regulations whenever such a policy change differentially impacts domestic producers.

Consider a specific example. Suppose there is a negative externality, such as pollution, generated by a domestically produced good. If the government addresses the externality by tightening environmental regulations, its domestic producers bear a production cost that foreign producers do not, shifting market share away from domestic firms. In terms of economic efficiency, an increase in a tariff that preserves the level of market access of foreign producers at the level

implied by the previous regulatory stance may be justified in these circumstances. The change in policy mix in the domestic economy improves welfare, because it allows government to address the pollution problem, while preserving the level of market access granted to foreign exporters.

Transparency

As discussed above, transparency on non-tariff measures is a necessary condition to achieve (and enforce) trade policy cooperation. This explains why the multilateral trading system aims at improving transparency of NTMs. The GATT, the GATS, and the SPS and TBT agreements include various obligations – requiring publication and notification of NTMs and services measures – that seek to improve transparency. These transparency obligations have been the subject of important discussions in the relevant WTO committees, and several actions have been taken to further improve transparency. For instance, during the Fourth Triennial Review of the TBT Agreement, the TBT Committee agreed to share experiences on good regulatory practices. A report by the Swedish National Board of Trade goes as far as to argue that “good regulatory practice at national level is the single most important aspect in the efforts to avoid unnecessary TBT” (Kommerskollegium, 2010). These efforts, as well as similar efforts on services measures and SPS measures, are discussed further in Section E.2.

The principal idea behind these efforts is that governments can benefit from the technical know-how and experiences of other governments' efforts in promoting efficient and transparent policy. Cadot et al. (2011) argue that documenting and understanding non-tariff measures and their effects is the first stage in an effort to make NTMs more efficient, particularly in countries that are struggling with legacies of complicated and penalizing regulations. Governments may pursue sub-optimal policies because they are not fully aware of their effects and of the existence of better alternatives.

This said, economic reasoning in Section E.1(b) indicates that governments also have an incentive to use opaque instruments to gain advantage at the expense of other governments. As will be discussed in Section E.4(b), governments may lack the incentive to adopt transparency measures because they are successful in lowering barriers to trade. Through government commitments to notify domestic measures and engage in good faith discussions about reducing the trade impact of non-tariff measures, the WTO Secretariat may be able to play an important role in illuminating opaque measures (Collins-Williams and Wolfe, 2010). The economic role of the notification process and the efficient design of rules to address governments' incentive problems to offer information are areas of research where more work would be highly desirable.

(ii) Deep integration

As argued in the historical overview in Section A, the treatment of non-tariff measures in the multilateral trading system has evolved over time. Initial emphasis was on the need to assure that tariff reductions were not offset by NTMs. The shallow integration approach built into rules such as national treatment and non-violation discussed above follows precisely this logic.

Over time, trade relations have evolved in response to a number of factors, including the increasing importance of international production, the expanding regulatory needs to protect consumers and other broad societal interests, such as public health and the environment. These changes have put pressures on the institutions governing trade, and governments have looked for ways to go beyond shallow integration arrangements into deeper forms of cooperation (at the multilateral or regional level). The design of deep trade agreements to regulate non-tariff measures is the topic of this sub-section.

There is no generally agreed definition of “deep” integration. According to Lawrence (1996), who first used this term, trade agreements that include rules on domestic policies that “fall inside the border” are deep agreements. On the other hand, often deep integration is simply defined in contrast to the shallow arrangements presented in the previous sub-section as any agreement that imposes further limits to local regulatory autonomy. While the *World Trade Report 2011* (World Trade Organization (WTO), 2011b) has a more detailed discussion of the concept of deep integration, the focus here is on three deep approaches that often emerge in the academic and policy debate: mutual recognition, linking tariffs and non-tariff measures in trade negotiations and the harmonization of domestic measures. These different approaches offer diverse tools to cooperate on non-tariff measures within a trade agreement.

Mutual recognition

Governments have adopted rules beyond national treatment to limit the discriminatory use of non-tariff measures, ranging from “regulatory competition” to “harmonization” (Hussey and Kenyon, 2011). Mutual recognition of domestic regulations is one such approach which has been adopted, most notably by the European Union. Specifically, so long as another EU member sells a product within its border, it is presupposed to meet domestic regulatory requirements elsewhere in the Union (see also Section D.3). Under mutual recognition, this means that each government has full sovereignty over its own technical regulations for domestically produced products but a limited ability to project those policies onto its trade partners or to determine the characteristics of products consumed domestically.

Mutual recognition has benefits and costs compared with national treatment disciplines discussed above (Costinot, 2008). Consider a specific example. Suppose that there is an externality associated with the consumption of either a domestic or foreign product. If there is a national treatment provision (and governments are not otherwise coordinating on technical regulations), whatever regulation is chosen will be extended to products from the foreign state. There is effectively one technical regulation for all “like” products. In this setting, the problem is that part of the costs of meeting the unified technical regulation is borne by foreign producers, whose welfare is not taken into account by the domestic government. This may result in an excessively stringent regulation. Because the government only internalizes the costs of regulations on the domestic and not on the foreign producers, it weighs domestic consumers’ concerns more heavily.

On the other hand, if countries adopt mutual recognition, governments may be tempted to set loose regulations, leading to a “regulatory race to the bottom”, because the rules will not account for externalities on the foreign market. Keeping in mind these trade-offs that characterize national treatment and mutual recognition, Costinot (2008) finds conditions under which one approach is superior to the other. Specifically, the author finds that national treatment tends to be more efficient when the traded goods are associated with a high level of cross-border spillovers.

Governments can also alter the agreement to address some of the weaknesses of this approach. A set of pre-negotiated minimal standards may serve the purpose of avoiding extreme (and socially inferior) outcomes. For instance, in 1985 when the European Union adopted mutual recognition of member states’ legislation concerning products, the EU directives set out “the essential requirements to be fulfilled to provide for protection of life, health and environment etc.”, with the specific intent of avoiding a regulatory race to the bottom (Kommerskollegium, 2010).

Linking tariffs and NTMs in trade negotiations

Commentators have developed two sets of arguments that support the view that tariffs and non-tariff measures, for instance domestic environmental or labour regulations, should be linked in trade negotiations. Below, they are referred to as the “grand bargain” and the “enforcement” argument.

According to the “grand bargain” perspective, cooperation on tariff and non-tariff policy is mutually beneficial and self-reinforcing. Therefore, linking different measures in a single grand bargain, for instance exchanging lower tariffs for new environmental regulations, may succeed in achieving mutually welfare-enhancing cooperation to a larger extent than separate

negotiations (Abrego et al., 2001). While this argument has a certain appeal, linking negotiations over different measures and diverse policy areas also comes at the cost of increasing complexity. The probability of a successful outcome, therefore, may well also depend on this more articulated contractual environment.

A second argument to regulate and link non-tariff measures in a trade agreement is the possibility of using tariffs as an enforcement device (Ederington, 2002; Limao, 2005; Spagnolo, 2001). In a setting where governments have an incentive to use domestic measures to manipulate the terms of trade, Ederington (2002) argues that retaliation through tariffs is the most efficient way to enforce cooperation on both tariffs and non-tariff measures. By contrast, it is never efficient to permit governments to distort their regulatory choices for market access purposes.

In a different setting, where regulatory cooperation on non-tariff measures is beneficial but suffers from an enforcement problem, embedding these measures in a trade agreement may provide a means of punishing violators and, hence, increasing welfare (Spagnolo, 2001). On the other hand, linkages may work against trade opening efforts. According to Limao (2005), linking the regulation of tariffs and NTMs may still be welfare improving whenever cross-border spillovers are sufficiently large (i.e. when policies are strategic complements).

Harmonization

Section D defines harmonization of non-tariff measures as the establishment of common measures, such as technical or safety standards, across different jurisdictions. The focus in that section is on the trade effects of these common measures. The emphasis here is on an institutional design issue: under what conditions do countries benefit from the harmonization of NTMs.

Economists have developed a simple principle to understand the costs and benefits of the harmonization of policies across different jurisdictions, known as the Oates' Decentralization Theorem (Oates, 1972). This theorem shows that there is a basic trade-off in setting common policies, such as harmonized technical regulations. The benefits depend on the extent of cross-border policy spillovers, for instance the extent to which a certain national environmental regulation impacts on the welfare of foreign citizens. The costs depend on the importance of the differences in policy preferences across countries. Specifically, for individual countries the cost of harmonization of a non-tariff measure is that it moves the measure away from its preferred national policy (i.e. a loss in national sovereignty); the benefit is that a harmonized NTM takes into account how the measure impacts on both the national and the foreign welfare (i.e. the policy spillover is internalized).

The Oates' Decentralization Theorem has a simple and intuitive prediction that can serve as a guiding principle for policy-makers. Harmonization of non-tariff measures is an efficient institutional response whenever cross-border policy spillovers are considered to be large and/or differences in policy preferences across countries are not important. For instance, Birdsall and Lawrence (1999) argue that deep integration with advanced economies may create advantages for developing countries that import best regulatory practices, but these benefits need to be traded off with the costs to governments of adopting common rules that, in certain cases, do not match national preferences and the needs of developing countries. This theoretical framework, therefore, offers important insights to negotiators to identify areas where social welfare considerations may justify policy harmonization.

A related issue is the proper forum where this harmonization should take place. Insofar as non-tariff measures create cross-border policy spillovers, as in the case of climate change related policies or food safety standards, there is a need for international cooperation. However, this cooperation may well be carried out in the context of a sector-specific agreement or standardization body, which are outside the competence of the WTO. From the perspective of a trade agreement, the question is one of international coherence. That is, how the environmental measures or the food safety standards relate to the international trade rules. We come back on this point in Sections E.2 and E.4.

A second issue is whether harmonization of non-tariff measures is more appropriate at the multilateral level or at the regional/bilateral level (i.e. within preferential trade agreements – PTAs). The *World Trade Report 2011* (World Trade Organization (WTO), 2011b) documents that a growing number of PTAs go beyond tariff reductions and include common rules on NTMs, such as harmonized standards or harmonized conformity assessment procedures (these practices were found in more than 40 per cent of a sample of 58 PTAs surveyed). In light of the preceding discussion, this finding is not surprising. Members of a PTA may share more similar policy preferences and/or experience stronger policy spillovers than the broad membership of the multilateral trade system. In this sense, harmonization in the regional context could provide an appropriate intermediate level of integration among certain nations and the global level.

However, as discussed in the *World Trade Report 2011* (World Trade Organization (WTO), 2011b), PTAs also have systemic effects through market segmentation that could lead to regulatory divergence and have adverse effects on world welfare. For example, an important trade-off discussed in the literature is that regulatory harmonization among countries of varying levels of development can reinforce a "hub-and-spoke" trade structure, with the larger partner representing the hub to whose standards the spokes conform. This

structure may carry costs. Disdier, Fontagné, and Cadot (2012) use a gravity model to show that when developed trading partners take steps to harmonize their regulations with a developed partner, trade with the developing countries declines.

2. Cooperation in specific policy areas: TBT/SPS and services measures

The previous section provided a theory-based discussion of the economic rationale for cooperation on non-tariff measures in a trade agreement. This section illustrates why and how countries cooperate over NTMs in specific policy areas. In particular, the focus is on SPS/TBT measures and domestic regulation in services.

(a) Cooperation on SPS/TBT measures

This section argues that countries cooperate on SPS/TBT measures to address information problems that arise when governments try to balance trade restrictiveness and achievement of policy objectives, and when seeking to follow best practice in the regulatory process. In this respect, countries cooperate by developing, disseminating and adopting common approaches to regulation. These activities, which promote regulatory cooperation, take place in various fora. For instance, this cooperation occurs in the WTO's TBT and SPS committees, in regulatory cooperation arrangements, and in international standardizing bodies. The focus here is on cooperation in implementing the existing TBT and SPS agreements.

(i) *Why do countries cooperate on SPS/TBT measures?*

Countries use SPS/TBT measures, which include technical regulations, standards and conformity assessment procedures, to achieve legitimate policy objectives, such as protection of human health and the environment, or preventing the spread of diseases and pests. In order to achieve their stated objectives, these measures invariably have trade impacts; some may be justifiable while others could be challenged as discriminatory or simply unnecessary to achieve the objective sought. Hence, the need for discipline.

The TBT and SPS agreements require that WTO members balance achievement of legitimate policy objectives against trade restrictiveness in the design and implementation of measures. In particular, members should ensure that measures are not more trade restrictive than necessary for the policy objective at hand, are proportionally restrictive to the risk of not meeting the policy objective, are based on scientific principles and not maintained without sufficient scientific evidence, and do not arbitrarily or unjustifiably

discriminate between members where the same conditions prevail.

Members have sovereign authority in deciding how to regulate under the SPS/TBT agreements. However, members do not always have sufficient information or capacity to regulate effectively or efficiently. Members may face, among other challenges, two information problems in this regard. First, members may not know which measure will be most efficient in striking the aforementioned balance between trade restrictiveness and policy fulfilment. Second, members may not know how best to design and implement SPS/TBT measures across the regulatory lifecycle. The fact that SPS/TBT measures are often opaque and complex, as discussed in Section E.1, compound these challenges.

Indeed, regulatory processes and their impacts may be difficult to grasp, and governments often face problems understanding regulatory needs, or the costs and benefits of their interventions (Harrington et al., 2000). Members may therefore use a particular SPS/TBT measure when it is neither an efficient nor effective instrument for their policy objective or generates unnecessary hindrances to international trade. If members impose SPS/TBT measures that fail to efficiently strike the balance mandated by the agreements, they risk being challenged in the TBT or SPS committees, or ultimately, in dispute settlement.

Setting an internationally agreed benchmark of an efficient regulation for a particular policy objective can help address the first sort of information problem. This benchmark can be used to assess whether a SPS/TBT measure adequately reflects policy objectives; those measures that are more trade restrictive than the benchmark may raise questions. The SPS/TBT agreements do this by strongly encouraging members to align their SPS/TBT measures with relevant international standards, which ideally are developed using the world's best available scientific and technical know-how regarding a particular policy problem.

With respect to the second sort of information problem, the use of an agreed set of regulatory steps that define an efficient regulatory intervention may be beneficial. Sharing a common regulatory language increases transparency and predictability of SPS/TBT measures, and provides common criteria against which to judge measures. Members encourage one another to follow common approaches, such as "good regulatory practice" (GRP), when crafting SPS/TBT measures, and Committee discussion provides further reinforcement of this.

(ii) *How do countries cooperate on SPS/TBT measures?*

Members cooperate to address information problems related to SPS/TBT measures in at least three

ways: at the multilateral level, through discussions in the TBT and SPS committees; by using international standards as a basis for regulation; and, more generally, by using and disseminating GRPs, and engaging in regulatory cooperation.

While GRP is not explicit in the TBT or SPS agreements, the discussions in both committees promote “regulatory convergence” by reducing unnecessary diversity in the way governments regulate.

Good regulatory practice and regulatory cooperation

Even when intended to address the same policy objective, not all regulations are created equal – there are significant variations across countries. While some differences are certainly inevitable and may even be necessary, some general lessons that are broadly applicable have been identified about how to regulate efficiently and effectively across the regulatory lifecycle. These lessons are, essentially, what is incorporated in good regulatory practice (GRP).

Experience and guidance on GRP have been compiled by bodies such as the World Bank, the Organisation for Economic Co-operation and Development and Asia Pacific Economic Co-operation (APEC).¹³ GRP emphasizes, inter alia, a deliberative process for identifying public policy problems, considering the costs and benefits of alternative regulatory measures (or of no regulatory intervention), using regulatory impact assessments (RIAs), relying on performance-based regulation, effective internal policy coordination

(*vis-à-vis* WTO obligations), and ensuring transparency and openness to facilitate stakeholder participation in the regulatory process. Thus, the use of GRP can help improve regulatory performance by increasing the transparency and openness of the regulatory process and by subjecting regulatory decision-making to impact analysis and periodic review.

Wider dissemination and use of GRP can to a certain extent provide a common, predictable framework within which countries make regulatory interventions; it induces countries to speak the same “regulatory language”. This is why WTO members engage in bilateral and plurilateral regulatory cooperation arrangements.¹⁴ Regulatory cooperation is a process by which officials engage with their counterparts from different governments in formal and informal settings, including by exchanging information on rules and principles for regulating markets, the objectives of which include the formulation of more compatible and transparent regulations and testing procedures, simplification and the lowering of trade barriers, and making it easier and less costly for exporters to demonstrate conformity with different requirements (see Box E.3 for some examples of regulatory cooperation in the TBT area).

Examples of regulatory cooperation arrangements among countries include initiatives such as the Trans-Pacific Partnership, the Transatlantic Economic Council, the US-EU High Level Regulatory Cooperation Forum, the Trans-Tasman Mutual Recognition Arrangement, and work in organizations such as the South Asian Regional Standards Organization, APEC, the

Box E.3: Examples of regulatory cooperation in the TBT area¹⁵

APEC: green technologies

Members of the Asia Pacific Economic Cooperation (APEC) share policy objectives with respect to trade and environmental protection, which they seek to forward through regulatory cooperation in emerging environmental technologies. The 2011 APEC Meeting of Ministers Responsible for Trade stressed the significant role of open trade and investment in the Asia Pacific region in fulfilling the common objective of environmental protection. The rationale behind such cooperation is that a reduction in unnecessary barriers to trade and investment in environmental goods and services would reduce their costs, and increase access to green technology, and therefore further achievement of the shared objective of environmental protection.

The APEC Sub-Committee on Standards and Conformance (SCSC) has worked to promote regional cooperation in green sectors through information exchange, enhanced transparency, and providing a baseline for the use of standards, technical regulations and conformity assessment procedures. These initiatives include the “Solar Technologies Standards and Conformance Initiative”, and “Green Buildings and Green Growth”. In the context of these initiatives, APEC members have recognized the need to conform with international standards, to promote mutual recognition of certification, and to increase stakeholder participation in the standards-setting process.

Several case studies have been undertaken on green technologies under the umbrella of these initiatives, particularly on “green buildings”, and in this respect work is being undertaken in cooperation with the World Bank and the World Green Building Council. In this context, there was recognition of the need to enhance consistency in the use of terminology related to green buildings in order to increase transparency and enable producers to better meet requirements across different regional partners. Standards development

work at APEC on green buildings involves both public and private stakeholders. The APEC SCSC is also collaborating with the ASEAN Consultative Committee on Standards and Quality in the context of work on green buildings.

This initiative illustrates how a policy objective that is common to the APEC membership, namely addressing market failures with cross-border effects related to environmental pollution, is being tackled through regulatory cooperation. In addition, this example shows how countries are trying to engage at an early stage on regulatory cooperation with respect to green technologies to ensure that future regulatory approaches further environmental protection and trade.

EU-China: Toys

RAPEX¹⁶-China is an online information exchange mechanism which seeks to enhance and regularize the transmission of data on product safety administration and enforcement between China and the European Union. The initiative emerged from the Memorandum of Understanding signed in 2006 between the European Commission Directorate-General for Health and Consumers (DG SANCO) and the General Administration of Quality Supervision, Inspection and Quarantine of China (AQSIQ). It is one element of regulatory cooperation between the European Union and China.

The initiative comprises information exchange between DG SANCO and AQSIQ with respect to toys of Chinese origin that have been identified as unsafe and therefore banned or withdrawn from the European market (as notified to the European Commission via RAPEX). For its part, AQSIQ works towards preventing future bans on Chinese toys in the European market, and informs the European Commission of the results of investigations conducted in response to these notifications, including any measures adopted.

The initiative aims to ensure quality and safety of consumer products, protect consumer rights and interests, and enhance consumer confidence in the context of growth of trade between China and the European Union. Furthermore, the initiative seeks to enhance coordination in toy standards work at the International Organization for Standardization (ISO) level, and to improve awareness in China about applicable requirements for toys in the European Union. It also includes technical cooperation activities to improve product quality and safety. RAPEX-China helps to build trust between regulators and consumers, reduce trade frictions, and create a culture of product safety, while maintaining an open market between the European Union and China for toys.

This example is of interest because it uses a novel information exchange mechanism for cooperation towards the achievement of toy safety. China and the European Union follow different national regulations or standards for toy safety, given differing national preferences in this respect. Under this arrangement, cooperation largely concerns the one-way flow of trade in toys from China to the European Union. Alternatives to this information exchange arrangement could be harmonization to international standards or full alignment of technical requirements, but these may be unrealistic objectives for various reasons. Instead, information exchange enables both China and the European Union to work together to meet shared policy objectives by reducing information asymmetries.

Association of Southeast Asian Nations (ASEAN), and the United Nations Economic Commission for Europe.¹⁷

Regulatory cooperation arrangements can provide an opportunity to influence how SPS/TBT measures are implemented in other countries. Promoting GRP in these arrangements facilitates discussion and information exchange on the trading partner's measures by providing common criteria and language for assessing measures. Formalized, standing regulatory cooperation arrangements (for example, the Transatlantic Economic Council between the United States and Europe) may increase certainty about a partner's regulatory responses to future problems or products. Moreover, regulatory cooperation in general

is about building trust among regulators with regard to regulatory systems and outcomes. This helps to provide confidence that SPS/TBT measures and conformity assessment procedures will strike an efficient balance between policy objectives and trade restriction.

There are different levels of trust, formality and degree of engagement. The most basic category of cooperation is simple information exchange and trust building, which will lower transaction costs. A more advanced category of cooperation is mutual recognition of accreditation systems and testing procedures, which lowers cost for exports by enabling conformity assessment to the requirements of export

markets to be carried out in domestic laboratories prior to export. Other categories of arrangements involving still greater levels of trust and engagement include mutual recognition of conformity assessment results, mutual recognition of technical regulations, including through recognition of equivalence, and full harmonization of both technical regulations and associated conformity assessment procedures.

Recalling the discussion in Section E.1(c) on the depth of integration in differing approaches to address non-tariff measures, the level of ambition for a particular regulatory cooperation activity may differ depending on the contexts of the countries involved.¹⁸ For example, regulatory cooperation between two major trading partners with strong economic ties may aspire to full harmonization, thereby leading to a high level of convergence. On the other hand, regulatory cooperation between two economies with very different political systems, income levels, and levels of development may have a lower level of ambition – for instance, to increase understanding and confidence-building to facilitate trade.

Shared regulatory traditions and institutional structures can make the deep forms of regulatory cooperation easier to achieve. Differences between countries, however, are not necessarily an obstacle to cooperation. In fact, differences between countries engaging in regulatory cooperation may provide impetus for regulatory innovation that increases efficiency and lowers costs.¹⁹

Of course, not all forms of regulatory cooperation can be captured by these broad categories, and many arrangements involve aspects of different categories. For instance, regulatory cooperation on a sector basis occurs between partners in regional organizations such as APEC and ASEAN, including various mechanisms with progressive levels of ambition under the umbrella of a single scheme. This enables partners to cooperate to an extent appropriate to their national circumstances.²⁰

Novel cooperation between member states of the Common Market for Eastern and Southern Africa (COMESA), the East African Community (EAC) and the Southern African Development Community (SADC) is occurring in the form of the Tripartite Non-Tariff Barriers (NTB) Mechanism. A web-based platform allows exporters to submit complaints about SPS/TBT measures in export markets that are creating trade problems, and then forwards complaints to responsible national authorities for resolution through bilateral consultations among the member states affected, or through relevant regional structures (Kalenga, 2012).

Both the TBT and SPS agreements encourage WTO members to cooperate. The SPS Agreement encourages bilateral equivalence arrangements (see Box E.4 and Section B), two of which have been notified to the SPS Committee. Similarly, the TBT

Agreement encourages members to reach agreements on mutual recognition of results of each other's conformity assessment procedures (see Section D.4). These arrangements are beneficial because they lower costs to exporters relating to the need to monitor potential policy changes in export markets (World Trade Organization (WTO), 2011b).

International standard-setting

The development of international standards is, by definition, a form of multilateral cooperation. Standardization activities are a process where stakeholders, including governments, cooperate on matters that may have a direct bearing on SPS/TBT measures. The outcome – an international standard – is a tangible result of such cooperation and is, essentially (and when at its best), a means of codifying and diffusing state-of-the-art scientific and technical knowledge related to a particular product or policy problem.²¹

Both the TBT and SPS agreements strongly encourage the use of international standards – as well as participation in the development of such standards. The agreements include a rebuttable presumption that regulations which are in accordance with relevant international standards will be, in the case of the TBT Agreement, “presumed *not* to create an unnecessary obstacle to international trade” and in the case of the SPS Agreement, “presumed to be consistent with the ... provisions of the Agreement”.²²

International standards are developed by governmental bodies, non-governmental bodies (including “private standards”), or sometimes a combination of both. While the SPS Agreement specifically names three international bodies that develop international standards which serve as benchmarks, the TBT Agreement does not name any specific body in this regard.²³ However, international standards are not a panacea – and the international standardization process itself may not always function ideally; this has been at the root of many discussions at the WTO, and presents a particular challenge for WTO members (this is further discussed in Section E.4).

Conformity assessment procedures

Cooperation does not only take place at the standards-development phase; it is also relevant to conformity assessment, and, more specifically, to facilitating the recognition of the results of conformity assessment (e.g. mutual recognition arrangements, equivalence agreements and the Supplier's Declaration of Conformity). In other words, actually meeting the standard may not be enough, it is also necessary to be able to demonstrate compliance to create confidence in the quality and safety of exported products (for many developing countries, there are capacity constraints in this regard²⁴). Members of the TBT

Box E.4: Equivalence in the SPS Agreement

The SPS Agreement creates a framework that supports convergence of policies to minimize the negative impacts of SPS measures on trade, while at the same time supporting policy diversity. To do this, the SPS Agreement explicitly recognizes that although measures may differ among trading partners, this does not imply that they do not achieve the same level of appropriate level of protection (ALOP). Indeed, in terms of the SPS Agreement, trading partners are obliged to accept SPS measures as equivalent if the exporting country objectively demonstrates that its measure achieves the importing country's ALOP. Equivalence can be accepted for a specific measure or measures related to a certain product or categories of products, or on a systems-wide basis. The Agreement also specifies that exporting countries should facilitate this process by providing importing countries' access for inspection, testing and other procedures.

ALOP can be achieved in different ways, and countries' measures may diverge due to political and health-related factors. The obligation to explore whether measures are equivalent creates incentives for countries to learn from the experience of their trading partners and thus may contribute to capacity building. Still, given the technological requirements inherent in many SPS measures, developing countries may have concerns about allocating resources to improving SPS capacity if they do not have confidence that their SPS measures will be recognized as equivalent.

To address the concerns of developing countries regarding the implementation of equivalence, the SPS Committee developed guidelines (G/SPS/19/Rev.2). These guidelines offer more details about the types of information that should be provided by both importing and exporting members. Specifically, the guidelines call for importing countries to identify relevant risks, explain its ALOP, and provide its risk assessment or technical justification for its measures. The guidelines also indicate that importing countries should take into account the history of trade with the exporting country since a history of trade implies a familiarity with the infrastructure and measures. The three sisters – Codex Alimentarius, the World Organization for Animal Health and the International Plant Protection Convention – have also developed guidance in the area of equivalence related to their specific areas of expertise.

Given the importance of dialogue among trading partners in order for the concept of equivalence to be effectively implemented, transparency should play a key role. The SPS Committee includes the issue of equivalence as a standing item on the agenda and has developed a notification template that captures information on equivalence agreements. Importing countries that have accepted the equivalence of SPS measures of other countries are expected to notify the relevant measures and affected products. To date, only two notifications have been submitted. While the notifications from countries have not been forthcoming, contributions during the SPS Committee by the three sisters²⁵ on their work programmes on equivalence enhances transparency of multilateral efforts in this area.

Committee have begun to consider the development of practical guidelines on how to choose and design efficient and effective mechanisms that can assist countries in cooperating also in the area of conformity assessment.

In this regard, both regional and international systems for conformity assessment can contribute to solving the problems related to multiple testing and certification/registration for traders and industries – a challenge that can be particularly difficult to overcome for small and medium-sized enterprises (SMEs). Delegations in the TBT Committee have recently been discussing the work of the International Laboratory Accreditation Cooperation (ILAC) and the International Accreditation Forum (IAF) as useful examples of international cooperation in the area of conformity assessment.²⁶

The ILAC is the global authority for laboratory and inspection body accreditation, and the IAF oversees accreditation in the fields of the certification of management systems, personnel and products. The objective of both organizations is the same: one conformity assessment result accepted in every market place. The main tool used by the two organizations is multilateral mutual recognition arrangements among accreditation bodies with a shared vision of a single global system of conformity assessment. This reduces risks for business, regulators and the consumer by ensuring that they can rely on accredited services. In the on-going Sixth Triennial Review of the TBT Agreement, prompted by a proposal from the United States,²⁷ there is discussion on how members' experiences in the use of these two international systems for conformity assessment can serve to strengthen the implementation of the TBT Agreement.

TBT and SPS committees

The TBT and SPS committees provide WTO members with the opportunity to discuss specific SPS/TBT measures as well as more general issues, such as good regulatory practices, international standards and transparency. With respect to GRP, members share information on the development and application of these practices. Members have emphasized that regulations developed in the spirit of GRP are more likely to achieve their public policy objectives, and less likely to be driven by competitiveness considerations.²⁸ Both committees hold regular discussions on international standards, and receive updates from observer bodies that set such standards.

WTO members also discuss specific trade concerns (STCs – see Sections B.2 and C.2) in the SPS/TBT committees. In some cases, the concern is simply a matter of clarification about the scope or status of the measure; in other cases, the concern relates to actual or perceived discriminatory or trade-restrictive aspects of draft or applied measures. These discussions encourage members to follow the benchmarks set by international standards, and to use GRP when formulating measures – thus promoting regulatory convergence. For instance, over one-third of the 330 specific trade concerns raised in the TBT Committee since 1995 have been related, in one way or another, to international standards.

Issues that arise in the SPS/TBT committees include whether an international standard was used as a basis for a particular measure, whether members have deviated from relevant international standards, and whether relevant international guidance exists. In addition, most specific trade concerns raised in the TBT Committee are indirectly related to the use or non-use of GRP in the context of a particular measure – for example, with respect to the rationale for a measure, transparency questions (e.g. public consultation), or regulatory design and an assessment of its impact on trade (e.g. the use of regulatory impact assessments). The discussion of specific trade concerns in the SPS Committee cover similar themes, with the same proportion of such concerns explicitly referring to international standards. Out of the 327 specific trade concerns raised in the SPS Committee since 1995, almost one-third referred to international standards. The largest proportion of concerns (about 40 per cent) have been related to animal health and zoonoses.²⁹ Food safety and plant health concerns each constitute about a quarter of the remaining concerns.

The multilateral review of trade concerns in the SPS/TBT committees helps to shed light on potentially problematic SPS/TBT measures, and encourages WTO members to avoid unnecessarily trade-restrictive measures that exceed benchmarks or do not follow best practice. In addition, members whose measures

are challenged often provide information or updates which increase the transparency of SPS/TBT measures and regulatory processes (see G/SPS/GEN/204/series and G/TBT/GEN/74/series). Furthermore, information about the impact that a certain measure has on trade can help members identify regulatory inefficiencies and further develop GRP. This is discussed in more detail in Section E.4.

Both committees also give members the opportunity to highlight draft SPS/TBT measures. The TBT and SPS agreements oblige members to notify the WTO Secretariat when they are drafting new SPS/TBT measures that are not in accordance with relevant international standards, and that may have a 'significant effect on trade'. Such notifications contain information about the products covered by the measure, its objectives and the rationale for the measure. They also allow other members to comment on the design of measures.

Since 1995, the TBT and SPS committees have taken decisions and developed recommendations³⁰ to extend the notification requirements laid out in the relevant agreements in order to further enhance the transparency of measures and to give members better access to information contained, or referred to, in notifications. Some examples include giving guidance to members about which measures should be notified, developing recommended timeframes for notifications as well as comment periods (minimum of 60 days) and entry into force (minimum of six months from the end of the comment period) and establishing procedures for making the full texts of SPS/TBT measures available in multiple languages. Other decisions and recommendations include encouraging members to respond to comments and to take these comments into account when finalizing measures and developing web portals for the WTO Secretariat to disseminate information on SPS/TBT measures.³¹

(b) Cooperation on services measures

As explained in Section B.3, the nature of services makes regulations the principal limit to market access. First and foremost, the feasibility of applying a tariff to the international provision of services is remote. Trade protection in services, where it exists, will be found in internal laws, regulations, rules, procedures, decisions, administrative actions, and other such measures. Although services regulations often do not primarily have a trade-related focus, there may be cases where regulations have unnecessarily trade-distortive and restrictive effects. Distinguishing between those regulations which are legitimate and those which are considered protectionist is fraught with difficulties. The sub-sections below review how countries cooperate in services depending on the type of measure in question.

(i) *How do countries cooperate on trade in services?*

To facilitate cooperation, services trade agreements, most notably the GATS, have distinguished between three types of services measures, namely:

- (i) measures restricting market access by setting quantitative restrictions and requirements on legal form (i.e. restrictions on the entry of, or limits on the output by, the services supplier)
- (ii) measures which discriminate against foreign services and services suppliers by modifying conditions of competition in favour of national services and service suppliers³²
- (iii) domestic regulations which are non-discriminatory and non-quantitative in nature.

The extent to which countries have been willing to cooperate on trade in services differs depending on the measures involved. The GATS framework defines measures in categories (i) and (ii) as market access and national treatment limitations which are to be reduced or eliminated through successive rounds of negotiations. Measures in category (iii), on the other hand, have largely not been subjected to trade disciplines, apart from certain general obligations under GATS. There is, however, a mandate in Article VI:4 of the GATS to negotiate disciplines on a specific set of domestic regulations, namely those measures relating to licensing, qualifications and technical standards. The rationale for negotiating disciplines on this particular set of domestic regulations is not too different from that of the TBT and SPS agreements, with the focus on ensuring that licensing and qualification procedures and requirements and technical standards do not constitute unnecessary barriers to trade in services.

Although there are strong parallels between the TBT and SPS agreements and the type of domestic regulation disciplines being negotiated under Article VI:4 of the GATS, the GATS framework for regulatory cooperation on services, apart from the negotiations of specific commitments, remains at a nascent stage. The discussion that follows examines the extent to which cooperation on each of these broad categories of measures can be said to be taking place in respect to the implementation and operation of the agreement. In the case of category (iii) domestic regulation, it should be noted that the focus is on those measures for which disciplines are being negotiated as the rationale, issues and challenges are very similar to those encountered in the TBT and SPS agreements.

(ii) *Cooperation on progressive liberalization*

Section B.3(c) has already provided a discussion of why quantitative restrictions and discriminatory

measures are the most trade distortive, thus providing a stronger case for cooperation. In principle, such cooperation is undertaken through negotiations to remove market access limitations and national treatment discrimination. The results of such negotiations are "bound" through a legal instrument, which can add credibility to existing and future reform as they are costly to revoke.

In the case of the GATS, cooperation on the measures in categories (i) and (ii) culminates in a WTO member undertaking to guarantee a minimum level of market access and national treatment for each committed sector. Schedules for specific commitments in services thus perform a similar function to tariff schedules for goods, in the sense that they facilitate cooperation through reciprocal bargaining. In the case of trade in services, this occurs through request-offer negotiations between pairs or groups of WTO members with common interests or demands, and could be thought of as a framework of cooperation.

There are good political economic reasons why WTO members might have been willing to cooperate on the removal of market access and national treatment limitations. Some of these have been discussed in Section B.3 and Section E.1. What is noteworthy is that the experience of the GATS, as well as preferential trade agreements, as shown by Roy et al. (2007), has mainly concerned liberalization commitments relating to market entry and discrimination and not other aspects of a member's regulatory regime or conduct.

Indeed, such an approach was the intended design of the GATS, which was why a separate mandate to negotiate disciplines on domestic regulation was necessary. Thus, when a WTO member removes a limitation on the number of foreign services suppliers that can operate in its territory, other types of regulations remain unaffected.

The regulator could still require that the services supplier obtain a licence before the service can be supplied. Obtaining such authorization could include the fulfilment of both substantive and procedural requirements. Employees of the services supplier may need to satisfy particular qualification requirements. The services supplier may need to ensure that the services provided conform with certain technical requirements. In addition, any business operation would be subject to environmental, health, safety and labour regulations. All of these non-discriminatory measures, which are typically found in licensing and qualification regimes, often have to be fulfilled before authorization to supply a service is provided. Thus, they may have a profound impact on services market access but would not be subject to negotiations on progressive liberalization.

In particular, domestic regulations in the form of cumbersome and/or opaque licensing and qualification

procedures, subjective or partial licensing and qualification criteria, excessively burdensome requirements and administrative “red tape” can serve to obstruct trade in services, even if they do not appear to be primarily directed at trade. The sheer diversity of regulatory systems and standards in markets internationally can also significantly raise the costs of compliance for the services supplier and act as indirect barriers to the supply of services, even in situations where there are no market access restrictions or discriminatory measures in force. This is why the GATS framework for cooperation had to go beyond the removal of market access and national treatment limitations of the type described in categories (i) and (ii) and address particular aspects of domestic regulation.

(iii) Cooperation on domestic regulation

While the economic theory for cooperation under the GATS is in part different from the one for the GATT (see Box E.1), there is an important similarity that is addressed here. The policy substitution problem discussed in Section E.1, with specific reference to trade in goods, could also apply to trade in services.

When WTO members make commitments on services measures in categories (i) and (ii), governments may face incentives to alter domestic regulations or to implement them in a particularly obstructive manner (i.e. Article VI:4 measures as described above). In practice, the problem may not arise in the same way in services trade as it does in goods trade since there is a large gap between GATS bindings and actual measures. There is less incentive to use domestic regulation as an alternative way of limiting market access or national treatment, since a member can change its regime up to the level of the binding. Indeed, policy substitution in services might also occur in reverse. Governments that lack adequate regulations and enforcement capacity might be reluctant to open markets and might therefore maintain market access restrictions.

Unlike the TBT and SPS agreements, the GATS has yet to fully develop a framework for cooperation on domestic regulation in services. There is a mandate in Article VI:4 of the GATS to negotiate any necessary disciplines to ensure that measures related to certain types of regulations (qualification and licensing requirements and procedures, and technical standards) are, among other things, based on transparent and objective criteria and not more burdensome than necessary to ensure the quality of the services. The Decision on Domestic Regulation (S/L/70) specifies three separate areas for the development of any necessary disciplines. This includes: (i) the development of generally applicable disciplines (i.e. horizontal disciplines to be applied to all sectors); (ii) disciplines for individual sectors or groups thereof; and (iii) disciplines for professional services.

In 1998, the Disciplines on Domestic Regulation in the Accountancy Sector (S/L/64) were adopted by the WTO's Council for Trade in Services. The relevant Council Decision (S/L/63) provides that the “accountancy disciplines” are applicable only to WTO members with specific commitments in accountancy. The disciplines are to be integrated into the GATS, together with any new results that the Working Party on Domestic Regulation may achieve in the interim, at the end of the current round of trade negotiations.

Subsequent to the Accountancy Disciplines, WTO members embarked on the negotiation of “horizontal disciplines” but this did not preclude the possibility of future work on “sectoral disciplines”. Issues concerning the negotiation of horizontal disciplines are discussed later in this section. It should be noted that there are already some existing general obligations requiring cooperation among members, particularly with respect to transparency and administrative procedures, and that the disciplines to be negotiated are expected to build upon them. The following sub-sections discuss how these have been used and the type of cooperation that would be required by domestic regulation disciplines.

Existing disciplines and mechanisms

Article III of the GATS requires WTO members to publish all measures pertaining to or affecting the GATS. In addition, for services which are covered by a member's specific commitments, there is an obligation to notify all laws, regulations or administrative guidelines significantly affecting trade in services. Members are also obliged to establish enquiry points to provide specific information to other members upon request. Notifications, if fully implemented, could be an important avenue to improve information sharing and to address issues of regulatory transparency in services. However, in practice, obtaining compliance with the notification obligation has been difficult to achieve. Several reasons for this low compliance are discussed in Section C and Section E.4 (b).

Other transparency requirements relate to the recognition of the education or experience obtained, requirements met, or licences or certifications granted to a services supplier in a particular country. Article VII of the GATS does not set any particular substantive requirements on how recognition should be undertaken but it requires the notification of existing recognition measures, as well as the opening of any new negotiations. In such a case, adequate opportunity should be provided to any member which indicates its interest in participating. However, as with the notification requirement in Article III, compliance has been limited.

Nevertheless, WTO members adopted a set of voluntary guidelines for mutual recognition agreements or arrangements in the accountancy sector. These

guidelines cover the conduct of negotiations, relevant obligations under the GATS, and the form and content of agreements. The objective is to make it easier for parties to negotiate recognition agreements and for third parties to negotiate their accession to them, or to negotiate comparable ones.

Apart from transparency, cooperation is also required on the administration of domestic regulation. These provisions, which are contained in Article VI of the GATS, have the goal of ensuring due process and openness in decision making. For instance, all measures of general application affecting trade in services, for which commitments have been taken, are to be administered in a reasonable, objective and transparent manner. Information must be provided on the status of applications for the authorization to supply a service. Where specific commitments regarding professional services have been undertaken, adequate procedures to verify the competence of professionals of another country must be provided. While all of these GATS provisions suggest that WTO members saw a need for cooperation on regulatory matters affecting trade in services, it is not clear to what extent these existing provisions have been utilized.

However, the adoption of Disciplines on Domestic Regulation in the Accountancy Sector (S/L/64) by the Services Council in December 1998 was a noteworthy achievement. These disciplines are to be integrated into the GATS, together with any new results that the Working Party on Domestic Regulation may achieve, at the end of the current round of negotiations. A core feature of the disciplines is their focus on (non-discriminatory) regulations that are not subject to scheduling under Article XVI (market access) and Article XVII (national treatment). The Accountancy Disciplines also included a provision that would require WTO members to ensure that such "measures are not more trade-restrictive than necessary to fulfil a legitimate objective". Legitimate objectives were defined as including the protection of consumers (which includes all users of accounting services and the public generally), the quality of the service, professional competence and the integrity of the profession.

Developing new disciplines

Apart from requiring adherence to the obligations discussed above and completing the Accountancy Disciplines, the GATS has not ventured much further into subjecting non-discriminatory domestic regulation to trade disciplines. Yet, WTO members recognized the need to cooperate on regulatory issues by establishing a mandate on domestic regulation disciplines in Article VI.4 of the GATS. Reaching understanding on the appropriate scope and ambition for such disciplines has been fraught with difficulties. A central problem has been how to distinguish between requirements in

pursuit of legitimate objectives and those which are aimed at restricting trade. Some members have argued in favour of a necessity test, while others are of the view that such a test would be too onerous and would unduly restrict the freedom of regulators. The discussion in Section B points to difficulties in answering this question for trade in services given the relatively limited theoretical and empirical work on this issue.

It also begs the question as to what extent could governments cooperate to minimize the negative effects arising from domestic regulation, amidst the considerable regulatory diversity across sectors and countries. In this regard, the experience of the TBT and SPS agreements are instructive where cooperation is focused on encouraging members to work towards eliminating or reducing requirements which are not necessary for the achievement of the policy objective at hand. Similar mechanisms could be used in services. These could include stronger transparency provisions, a general presumption in favour of international standards and an institutional framework for monitoring and information exchange. The TBT and SPS agreements also contain a necessity test, a subject of much contention in the context of the domestic regulation negotiations (see Section E.4(e) (iii)).³³

Despite these similarities, there is a critical difference in that services are intangible and thus cannot be sampled, tested and inspected. Thus, procedures and methods used in TBT and SPS measures cannot be easily applied to services – for instance, the development of science-based standards through laboratory testing is much harder or simply not feasible for services. This in turn suggests that evaluation, verification and assurance of conformity can often not be undertaken on the service itself but has to be on the service supplier. Since the "product" cannot be easily examined, regulatory precaution is likely to be higher in services than it is for goods and establishing a commonly acceptable level of risk tolerance harder to achieve.

Below is a description of the type of issues on which cooperation among countries is being sought in the context of the domestic regulation negotiations. It should be noted that services negotiations deal separately with the issues related to transparency, objectivity and the simplification of procedures.

Transparency

The negotiations seek to ensure that information on regulatory requirements and procedures are accessible to all parties concerned. This includes the publication and availability of information on regulations and procedures, the specification of reasonable time periods for responding to applications for licences, information on why an application was rejected and notification on what information is

missing in an application. It also includes specification of reasonable time periods for responding to applications and information on procedures for review of administrative decisions.

The new domestic regulation disciplines are intended to take account of, and build on, Article III provisions of the GATS on publication and notification of measures (see also Section E.4). Should the transparency provisions be agreed, it would contribute to reducing information asymmetries which are prevalent in services sectors and would provide greater certainty to services suppliers.

Impartiality and objectivity

Services suppliers typically want to be assured that assessments by regulatory and supervisory authorities for authorization to supply a service, if such authorization is required, will be conducted in a reasonable, impartial and objective manner. It is also well recognized that efficient outcomes are best achieved when decisions are independent from any commercial interests or political influence. In this connection, the formulation of clear criteria and procedures can be vitally important to avoid excessive discretion and to help ensure reasonableness, impartiality and objectivity in the regulatory process.

Simplification of procedures

Long and complex procedures for assessing an application for authorization to supply a service may discourage services suppliers to seek access to a host member. Such complexity may also serve to hide protectionist intentions. Simplification of procedures will facilitate the activities of services suppliers and reduce the opportunities for hidden protectionism.

Nonetheless, in many services sectors, the characteristics of the services supplied may not always allow for very simple procedures to be adopted. For instance, several authorities may need to be involved in ensuring the quality of the service, in avoiding negative impact on the environment or in enabling public consultations. The complexity of a procedure thus needs to be considered in its context. Linked to the issue of simplification is procedural certainty. It stands to reason that services suppliers would expect that assessment criteria are not modified during the course of an application. Should this be unavoidable, applicants would need to have a reasonable time period to adjust to amended criteria or procedures.

Recognition of equivalence

To ensure that foreign services suppliers meet the qualification and other standards imposed on suppliers of national origin, regulators are often called upon to assess the equivalence of domestic and foreign qualifications. In many cases, they may require foreign

applicants for licences or other badges of authority to submit a service to tests or to fulfil conditions to demonstrate equivalence. Since such tests are imposed to ensure that a domestic standard is met, they may be regarded as domestic regulations. Negotiations on Article VI.4 disciplines have been grappling with the question of how to ensure that such requirements should be no more burdensome than necessary to ensure the quality of the service. Regulators in these situations could be obliged to take account of qualifications already earned in the home country of the foreign services supplier and to modify accordingly any additional requirements imposed upon them.

The concept of equivalence has already been used in the qualification requirements section of the Accountancy Disciplines, in Article 2.7 of the TBT Agreement and in Article 4.11 of the SPS Agreement. Complementing this principle, governments are encouraged to negotiate agreements to accept the equivalence of qualifications obtained under other jurisdictions or unilaterally recognize equivalence.³⁴

International standards

Acceptance of international standards could facilitate the evaluation of qualifications obtained abroad and help promote services trade. Governments involved in standard-setting at the international level should ensure that this is done in as transparent a manner as possible in order to avoid “capture” by specific-interest groups. GATS Article VI:5(b) says that in determining whether the requirements are compatible with the principles of necessity, transparency and objectivity, account shall be taken of international standards of relevant international organizations applied by WTO members.

The term “relevant international organizations” refers to international bodies whose membership is open to the relevant bodies of at least all members of the WTO. The TBT and SPS agreements already contain a strong presumption in favour of international standards. In services, whilst there is a strong incentive for a similar presumption in favour of international standards, there are significant obstacles. For a start, international standards are less prevalent in services as compared with goods. There are also questions concerning the exact nature of technical standards in services; are they predominantly product or process standards, or both, and to what extent could a trade discipline cover voluntary standards, which may be issued by non-governmental organizations without any delegated authority. In the TBT context, a distinction is made between “standards” as voluntary measures and “technical regulations” as mandatory. The GATS, however, makes no such distinction.

Cooperation will not in itself be sufficient to address all externalities which might arise from regulatory divergence. The relative scarcity of international standards in services, as compared with goods,

reflects in part the differences in regulatory preferences. In such a situation, the regulatory divergence between jurisdictions could well be a direct consequence of a preference for a particular objective as well as its level of attainment. It is not obvious why countries would compromise on achieving a regulatory objective which is considered legitimate and necessary. At best, cooperation might be sought on finding less trade-restrictive means of achieving such an objective or on ways to help services suppliers meet particular standards or other substantive requirements.

Cooperation on domestic regulation in services would require a mix of negative integration, in terms of common prohibitions on particular practices and/or adherence to a particular set of principles. It would also need to be complemented by positive actions to improve regulators' understanding of, and confidence in, standards and requirements with which they may not be familiar.

Cooperation on domestic regulation in services may thus require action to be taken on at least three fronts: (i) establishing an appropriate framework of rules to ensure that domestic regulation does not constitute an unnecessary barrier to trade in services; (ii) promoting greater use of trade instruments for pro-competitive regulation; and (iii) supporting regulatory capacity building for trade in services. The first of these is already being undertaken through the domestic regulation negotiations under the GATS Article VI:4 mandate. The other two action points call for greater regulatory cooperation among agencies and international organizations, and could be linked with a technical cooperation agenda to address regulatory supply-side constraints. These challenges are discussed in greater detail in Section E.4.

(iv) Other forms of cooperation

Cooperation among regulators has been most evident in the telecommunications sector. Going beyond the elements contained in the GATS Article VI:4 mandate, the Reference Paper containing a set of pro-competitive principles was a major achievement of the 1997 Agreement on Basic Telecommunications. The Reference Paper has helped shape the regulatory environment for telecommunications by elaborating a set of principles covering matters such as competition safeguards, interconnection guarantees, transparent licensing processes and the independence of regulators.

Unlike a general obligation, this instrument enters into force when it is attached by a WTO member to its schedule of specific commitments. Strictly speaking this instrument deals with a broader set of regulatory issues than those contained under the Article VI:4 mandate. It is mentioned here as it provides a useful example of regulatory cooperation which might perhaps

be emulated in other sectors. The Reference Paper approach which is undertaken as additional commitments (Article XVIII) could also serve as a model for cooperation on other regulatory issues, including domestic regulation disciplines under Article VI:4. These issues are discussed further in Section E.4.

The various GATS bodies dealing with implementation and operation of the Agreement also provide fora for cooperation on other aspects of services regulations. Members can, and have raised, regulatory matters for discussion. For example, the Council for Trade in Services has been examining regulatory issues relating to international mobile roaming charges. The Committee on Trade in Financial Services has pursued discussions on the financial crisis and regulatory reform issues. The Committee on Specific Commitments, in addressing regular issues such as the classification of services, requires the interaction of regulators with specific expertise and knowledge of the industry. That being said, these bodies – unlike the TBT and SPS committees – were not primarily designed as fora for regulatory cooperation. The fact that there is no such forum is not surprising since the GATS has yet to negotiate a set of disciplines that would serve a similar purpose as the SPS and TBT agreements.

Outside of the WTO, cooperation on regulation affecting trade in services occurs in many different fora. Roy et al. (2007) have found that overall services liberalization commitments in preferential trade agreements (PTAs) have gone beyond current GATS commitments as well as offers tabled in the Doha Round negotiations. There is, however, little evidence to suggest that PTAs have gone further than the GATS in developing disciplines on domestic regulation or in establishing new avenues for regulatory cooperation. Most PTAs have replicated the provisions contained in Article VI of the GATS. It would seem that PTAs have encountered the same difficulties as at the multilateral level in moving this subject forwards. There are, however, some exceptions.

Mattoo and Sauvé (2010) have noted the inclusion of a necessity test in the Switzerland-Japan PTA, a full chapter on domestic regulation in the Australia-New Zealand Closer Economic Relations Agreement, and additional services-specific provisions on transparency in US agreements. There are also necessity test provisions in the Trans-Pacific Strategic Economic Partnership Agreement and in Mercosur.

Outside the context of trade negotiations, certain regional organizations have developed principles or codes of good regulatory practices that would complement services liberalization. Some of the most developed of these include the OECD Guiding Principles on Regulatory Quality and Performance and the APEC-OECD Integrated Checklist on Regulatory Reform. These instruments, which deal with all

regulations and not just those involving the services sector, provide non-binding principles on how to design regulations which support market openness and competition.

There is also a relatively long history of regulatory cooperation at the sectoral level, such as in postal and communications services, financial services, transportation, education as well as certain professional services. Such cooperation has been necessary to deal with the effects of international inter-dependencies which demand coordinated regulatory response from different jurisdictions in order to be effective. Cooperation has also been required to achieve compatibility and inter-operability between different systems and networks.

For example, the International Federation of Accountants (IFAC), the International Accounting Standards Committee (IASC) and the International Organization of Securities Commissions (IOSCO) set international standards for the accountancy sector. The Universal Postal Convention defines general guidelines on international postal services and regulations on the operations of mail services. The standards developed by the International Telecommunication Union (ITU) are fundamental to the functioning and inter-operability of information, communication and technology (ICT) networks globally. In education, the Regional Conventions of the United Nations Educational, Scientific and Cultural Organization (UNESCO) have been the main international instruments addressing the recognition of academic qualifications for academic and sometimes professional purposes.

In the financial sector, the Basel Committee on Banking Supervision provides a forum for regular cooperation on banking supervisory matters, with the objective of enhancing understanding of key supervisory issues and improving the quality of banking supervision worldwide. A Financial Stability Board (FSB), which brings together national authorities responsible for financial stability in significant international financial centres, international financial institutions, sector-specific international groupings of regulators and supervisors, and committees of central bank experts, has also been established. The FSB coordinates the work of national financial authorities and international standard-setting bodies, with the aim of developing and promoting effective regulatory, supervisory and other financial sector policies.

Although not undertaken primarily for the purposes of trade, such cooperation has important implications, as it can encourage greater understanding, if not harmonization, among regulators. There are, however, risks as international standard setting or regulation may by chance or by design serve the interests of those that have the resources to participate in and

influence the process. While such concerns have been very much at the forefront in goods trade (see Section E.4), there has been less discussion and awareness of it in services trade. Some of this has to do with the fact that the regulation of services is less developed at the international level and where such instruments do exist, they tend to focus on particular sectors.

3. GATT/WTO disciplines on NTMs as interpreted in dispute settlement

The discussion in preceding sections of this report has explained that, while some non-tariff measures are motivated principally by a desire to protect import-competing sectors, others pursue legitimate public policy objectives, such as safeguarding human and animal health, consumer protection, or promoting environmental sustainability. In this sub-section, we look at GATT/WTO rules, as interpreted in dispute settlement, with a view to understanding how they may or may not reflect some of the insights drawn from the economic analysis in previous sections.

More specifically, this sub-section first discusses how GATT/WTO rules reflect the economic motivations for multilateral cooperation that were analysed in Section E.1. Secondly, it discusses the extent to which GATT/WTO rules on non-tariff measures take into account the economic rationales for adopting such measures, which were analysed in Section B. Section E.4 will then take this analysis further by discussing some specific issues that arise when GATT/WTO rules are contrasted against the insights provided by economic theory.

(a) GATT/WTO rules on trade in goods and reasons for multilateral cooperation

In the case of goods, the GATT/WTO agreements limit the policy instruments that WTO members may use to protect import-competing industries. Tariffs are the only legitimate form of protection that may be used. Members have negotiated maximum levels of tariffs (known as “tariff bindings”) and may not apply tariffs that exceed those levels (see GATT Article II). The maximum levels of tariffs that a member may apply are set out in the member’s schedule of concessions. Members are also prohibited from applying “all other duties or charges of any kind imposed on or in connection with the importation” unless they have reserved the right to do so in their schedules of concessions.

For many years, the principal disciplines that applied to non-tariff measures were the prohibition on quantitative restrictions in GATT Article XI and the non-discrimination obligations in Article I (most-favoured nation – MFN) and Article III (national

treatment) of the GATT. These disciplines were supplemented by the possibility of bringing a non-violation claim where a contracting party considered that a measure, despite being consistent with the provisions of the GATT, nevertheless “nullified or impaired” any benefit accruing to it under the Agreement.

The MFN obligation applies to both internal and border measures. It requires WTO members to treat an imported product from one member no less favourably than the “like” domestic product imported from another country. The national treatment obligation concerns internal measures, such as internal taxes and regulations relating to the sale of a product. It requires members to treat an imported product no less favourably than the like domestic product. One of the key issues that has been discussed in GATT/WTO dispute settlement in connection with the national treatment obligation is the extent to which it forbids measures that have a disparate impact on imports, but can be objectively shown to have a legitimate regulatory purpose. This issue is further discussed in Section E.3(b).

As explained in Section E.1, the overall framework of the GATT is consistent with a policy substitution approach. The GATT also had certain rules that went beyond constraining members from replacing one policy (such as tariffs) with another, such as non-tariff measures. In particular, the GATT included important transparency obligations that respond also to the problem of incomplete information.

Some of the Uruguay Round agreements introduced obligations that extend significantly beyond the policy substitution approach of the GATT. These have been referred to as “post-discriminatory” obligations (Hudec, 2003). Of particular relevance to this report are the obligations contained in the SPS and TBT agreements. Both of these agreement contain non-discriminatory obligations. However, they set out additional requirements that apply to non-tariff measures within their scope. Thus, for example, the SPS Agreement also requires that SPS measures be based on scientific principles. For its part, the TBT Agreement requires that technical regulations not be more trade-restrictive than necessary to fulfil a legitimate objective.

One result of this “post-discriminatory” approach is that the link with the market access concessions protected under a policy substitution approach is more tenuous. Despite the underlying policy substitution rationale underlying the GATT/WTO agreements, today there does not appear to be an overarching requirement that a WTO member show how its overall market access has been undermined when it challenges a non-tariff measure. The only measures for which there is a requirement to demonstrate negative effects as part of a claim of violation are

actionable subsidies. By contrast, a member challenging, for instance, an advertising ban under GATT Article III:4 need not demonstrate any trade effects to succeed in its claim. Nor is there a requirement to show trade effects when challenging SPS measures or technical regulations either.

In sum, the disciplines that apply to non-tariff measures other than actionable subsidies are not directly tied to specific market access concessions. Put differently, a member can challenge an NTM irrespective of whether it has demonstrable trade effects. Having said that, one would expect that members normally will not invest the resources necessary to prosecute a complaint unless the measure has some trade impact.

As originally framed, Article XXIII of the GATT required a contracting party challenging a measure taken by another contracting party to demonstrate that such a measure “nullified or impaired” a benefit expected by that contracting party under the GATT (J. H. Jackson, 1989). In 1962, however, a GATT dispute settlement panel determined that where there was a “clear infringement” of a GATT provision, “the action would, prima facie, constitute a case of nullification and impairment...” (GATT *Uruguay – Recourse to Article XXIII*, para. 15). This legal presumption was later codified and is now incorporated in Article 3.8 of the Dispute Settlement Understanding (DSU).

The claim of nullification or impairment has been the subject of discussion in economic literature where it has been identified as an efficient mechanism to discipline non-tariff measures (see Section E.1(c)). It is still possible for a WTO member to challenge a measure that is not inconsistent with the GATT, but that nonetheless “nullifies or impairs” benefits it expected to obtain under the Agreement. However, as explained below, non-violation claims are subject to stringent requirements and are seldom pursued other than when they are “thrown in” as an alternative claim in case the claims of violation do not succeed.

The vast majority of WTO disputes concern allegations of violation. No WTO member has successfully rebutted the presumption of nullification or impairment, resulting from a finding of violation, by showing that the measures had no actual effect on trade (World Trade Organization (WTO), 2004).

In *EC – Bananas III*, the European Communities attempted to rebut the presumption of nullification or impairment with respect to the panel’s findings of violations of the GATT 1994 on the basis that the United States had never exported a single banana to the European Community, and therefore, could not possibly suffer any trade damage. The Appellate Body rejected the European Communities’ argument and, in doing so, endorsed the following reasoning by an earlier panel:

“Article III:2, first sentence, cannot be interpreted to protect expectations on export volumes; it protects expectations on the competitive relationship between imported and domestic products. A change in the competitive relationship contrary to that provision must consequently be regarded *ipso facto* as a nullification or impairment of benefits accruing under the General Agreement. A demonstration that a measure inconsistent with Article III:2, first sentence, has no or insignificant effects would therefore in the view of the Panel not be a sufficient demonstration that the benefits accruing under that provision had not been nullified or impaired even if such a rebuttal were in principle permitted” (Panel Report, *US – Superfund*, para. 5.19).

The claim of non-violation has been described as an “exceptional remedy” which “should be approached with caution” (Panel Report, *Japan – Film*, para. 10.37 and Appellate Body Report, *EC – Asbestos*, para. 186).

(b) GATT/WTO rules on trade in goods and economic rationales for NTMs

Section B explained that non-tariff measures may be justified where such measures address a genuine situation of market failure. Section B further explained that, whereas the welfare effects of an NTM that addresses a genuine market failure are positive, the trade effects are ambiguous.

Since its inception, the GATT/WTO regime has recognized that WTO members may need to adopt non-tariff measures to address market failures. In this regard, GATT/WTO rules on NTMs can be understood as providing “devices” that help distinguish measures that genuinely seek to address a market failure from those that have opportunistic motivations (see Trachtman, 1998; Marceau and Trachtman, 2009). In some cases, GATT/WTO rules also seek to minimize the trade impact of an NTM otherwise adopted for a legitimate policy purpose.

Despite what some critics have said, GATT/WTO rules do not establish a hierarchy between the trade commitments of WTO members and the public policy objectives that these members may pursue through domestic regulation. Ultimately, GATT/WTO rules allow for the application of non-tariff measures that pursue a legitimate non-protectionist purpose, even where the measures have trade effects. The “devices” set out in the WTO agreements to draw the line between protectionist and non-protectionist NTMs are described below.

(i) *Non-discrimination and the relevance of intent or purpose*

As discussed in Section E.1, the non-discrimination obligations in Articles I and III of the GATT are the primary devices used in the GATT to constrain policy substitution. Additional flexibility is provided under the general exceptions in Article XX of the GATT, which allows certain measures that pursue the public policy objectives recognized in that provision, such as the protection of human, animal, or plant life or health, and the conservation of exhaustible natural resources.

Even with the additional flexibility provided under Article XX, some fear that the national treatment obligation in Article III can be too blunt an instrument if it is applied mechanically. Those who hold this view advocate an interpretation of the national treatment obligation that does not focus exclusively on whether the challenged non-tariff measure has an impact on imports that is different from the impact on the “like” domestic product. Rather, in their view, the analysis should also take account of the intent or purpose behind the challenged measure, thereby only constraining those measures that do not pursue a legitimate purpose.

As Lester (2011) explains, three positions have been advocated as to the relevance of intent or purpose for the assessment of a domestic regulation under Article III. Those in the first group consider that intent or purpose has no role to play in the analysis of national treatment. Instead, they consider that intent or purpose may be relevant, if at all, where the respondent member invokes one of the general exceptions in Article XX of the GATT. The other two groups believe that intent or purpose must necessarily be considered in the analysis under Article III, yet differ as to where precisely intent or purpose comes into the analysis. One group advocates consideration of intent or purpose in determining whether the imported and domestic products are “like”. The other group sees intent or purposes as being part of the analysis of whether the imported product is being treated less favourably than the domestic product.

Two GATT panels sought to include consideration of regulatory purpose in the assessment of discrimination in what became known as the “aims and effects test” (*US – Malt Beverages* and *Canada – Provincial Liquor Boards (US)*). Hudec describes the “aims and effects test” as making the following two improvements to the traditional approach. First, the new approach “consigned the metaphysics of ‘likeness’ to a lesser role in the analysis, and instead made the question of violation depend primarily on the two most important issues that separate bona fide regulation from trade protection – the trade effects of the measure, and the bona fides of the alleged regulatory purpose behind it”. Secondly, “by making it possible for the issue of regulatory justification to be considered at the same

time the issue of violation itself is being determined, the 'aim and effects' approach avoided both the premature dismissal of valid complaints on grounds of 'un-likeness' alone, and excessively rigorous treatment" (Hudec, 2003: 628).

Regan (2003) has also advocated including consideration of regulatory purpose as part of the assessment of non-discrimination under GATT Article III. In his view, the central inquiry in the assessment of non-discrimination under Article III should be whether the measure is the result of a protectionist legislative purpose. He clarifies that this is not a question of the subjective motives of individual legislators. Rather, it is a question at a more general level about what political forces were responsible for the ultimate political outcome. Regan recognizes that there may be multiple purposes behind the enactment of a regulation. In such a case, he suggests that the regulation be invalidated only if the contribution of protectionist purpose was a "but for" cause of the adoption of the regulation.

It is common understanding that the "aims and effects" test was rejected in *Japan – Alcoholic Beverages*, the first non-discrimination dispute about internal taxes decided under the WTO dispute settlement mechanism (see Roessler, 2003). The issue also came up in *EC – Bananas III*, where the Appellate Body refused to apply the "aims and effect" test in the context of analysing a claim under Articles II and XVII of the GATS. However, some commentators have noted that subsequent Appellate Body reports would appear to recognize some role for regulatory purpose in the assessment under GATT Article III (Regan, 2003; Porges and Trachtman, 2003).³⁵ This is a matter of current debate as a result of the Appellate Body's rulings on Article 2.1 of the TBT Agreement in *US – Clove Cigarettes* and *US – Tuna II (Mexico)* (see below).

Both the SPS and the TBT agreements include non-discrimination obligations, although they operate somewhat differently. The SPS Agreement provides that SPS measures must not "arbitrarily or unjustifiably discriminate between Members where identical or similar conditions prevail, including between their own territory and that of other Members". This language is a recognition of the fact that, due to differences in climate, existing pests or diseases, or food safety conditions, it is not always appropriate to impose the same sanitary and phytosanitary requirements on food, animal or plant products coming from different countries. SPS measures sometimes vary, depending on the country of origin of the food, animal or plant product concerned. Marceau and Trachtman (2009) contrast this provision with Article III of the GATT, noting that the former does not seem to call for a "like product" analysis, but rather is focused on the justification for the discrimination between situations.

The language of Article 2.1 of the TBT Agreement is closer to that of Article III of the GATT. The TBT

Agreement provides that WTO members shall ensure that in respect of technical regulations, products imported from the territory of any member shall be accorded treatment no less favourable than that accorded to like products of national origin and to like products originating in any other country.

As noted above, the relevance of the rationale or purpose of the measures has been the subject of intense debates in the context of Article III of the GATT. The issue has now been raised in the context of Article 2.1 of the TBT Agreement. It is worth recalling, in this regard, that the TBT Agreement does not include a general exceptions provision similar to GATT Article XX.

Three recent panels took differing approaches with respect to the relevance of intent or purpose for the assessment of likeness under Article 2.1 of the TBT Agreement. The panel in *US – Tuna II (Mexico)*, referring back to the Appellate Body's interpretation of Article III:4 of the GATT in *EC – Asbestos*, interpreted the term "like products" in Article 2.1 of the TBT Agreement as relating to the nature and extent of a competitive relationship between and among groups of products (Panel Report, *US – Tuna II (Mexico)*, para. 7.225). In other words, this panel was reluctant to take the intent or purpose of the measure into account at this stage. The panel in *US – COOL (Certain Country of Origin Labelling)* took a similar approach.

By contrast, the panel in *US – Clove Cigarettes*, which examined a claim against a tobacco measure that prohibits cigarettes with characterizing flavours, other than tobacco or menthol, refused to undertake the analysis of likeness "primarily from a competition perspective". Instead, the panel was of the view that the weighing of the evidence relating to the likeness criteria should be influenced by the fact that the measure at issue was "a technical regulation having the immediate purpose of regulating cigarettes with a characterizing flavour for public health reasons". This meant that it had to "pay special notice to the significance of the public health objective of a technical regulation and how certain features of the relevant products, their end-uses as well as the perception consumers have about them, must be evaluated in light of that objective".

The panel therefore concluded that "the declared legitimate public health objective" of the measure at issue – that is, the reduction of youth smoking – "must permeate and inform our likeness analysis". In particular, the panel considered that the declared legitimate public health objective was relevant in the consideration of the physical characteristics that are important for the immediate purpose of regulating cigarettes with characterizing flavours, as well as the consumer tastes and habits criterion where the perception of consumers, or rather potential consumers, can only be assessed with reference to

the health protection objective of the technical regulation at issue (Panel Report, *US – Clove Cigarettes*, para. 7.119).

Another interesting aspect of the panel proceedings in *US – COOL* is that the parties extensively argued about alleged actual trade effects – and whether such effects were attributable to the measures at issue (the *COOL* measure) or to other factors. The parties submitted economic figures and analyses, including econometric studies. For the panel this was an important factual matter in the dispute: the panel found it important to make findings on the actual trade effects of the *COOL* measure, even if, under the legal standard it had identified for Article 2.1 of the *TBT Agreement*, these findings were not indispensable for the analysis of the complainants' claim. Indeed, the panel went further, arguing that it had the right, "and in fact the duty, to make the factual findings necessary to carry out an objective analysis of the dispute and all of the evidence before us", and the basic function of panels did not exclude – and could, in fact, necessitate – the review of economic and econometric evidence and arguments.

Hence, while the panel did not actually undertake any econometric analysis of its own, it assessed the robustness of the contradictory US and Canadian studies, stressing that the econometric studies, unlike the descriptive analyses, were able to isolate and quantify the different factors at play. It concluded that the Canadian (Sumner) Econometric Study had made a *prima facie* case that the *COOL* measure had a robust negative and significant effect on the import shares and price basis of Canadian livestock. It also concluded that this impact demonstrated by the Canadian Study, and not refuted by the USDA Econometric Study, concurred with its finding that the *COOL* measure accorded less favourable treatment (for muscle cuts) within the meaning of Article 2.1 of the *TBT Agreement* (Panel Report, *US – COOL*, paras. 7.444-7.566).

All three panel reports were appealed, but at the time of writing only the Appellate Body reports in *US – Clove Cigarettes* and *US – Tuna II (Mexico)* had been circulated.

The Appellate Body disagreed with the *US – Clove Cigarettes* panel's interpretation of the concept of "like products" in Article 2.1 of the *TBT Agreement*, which focused on the purposes of the technical regulation at issue, as separate from the competitive relationship between and among the products. In the Appellate Body's view, "the context provided by Article 2.1 itself, by other provisions of the *TBT Agreement*, by the *TBT Agreement* as a whole, and by Article III:4 of the *GATT 1994*, as well as the object and purpose of the *TBT Agreement*, support an interpretation of the concept of 'likeness' in Article 2.1 that is based on the competitive relationship between and among the products". Regulatory concerns underlying a technical

regulation may be taken into account only to the extent that they are relevant to the examination of certain likeness criteria and are reflected in the products' competitive relationship.³⁶ Ultimately, however, the Appellate Body found that the "likeness" criteria that the panel had examined supported the panel's overall conclusion that clove and menthol cigarettes are like products within the meaning of Article 2.1 of the *TBT Agreement* (Appellate Body Report, *US – Clove Cigarettes*, paras. 156 and 160).

The Appellate Body also addressed the less favourable treatment element of Article 2.1 of the *TBT Agreement*, noting that a panel examining a claim of violation under Article 2.1 should seek to ascertain whether the technical regulation at issue modifies the conditions of competition in the market of the regulating member to the detriment of the group of imported products *vis-à-vis* the group of like domestic products.

The Appellate Body further explained that "the context and object and purpose of the *TBT Agreement* weigh in favour of interpreting the treatment no less favourable requirement of Article 2.1 as not prohibiting detrimental impact on imports that stems exclusively from a legitimate regulatory distinction". This means that where a technical regulation does not *de jure* discriminate against imports, "the existence of a detrimental impact on competitive opportunities for the group of imported *vis-à-vis* the group of domestic like products is not dispositive of less favourable treatment under Article 2.1". Panels must further analyse whether the detrimental impact on imports stems exclusively from a legitimate regulatory distinction rather than reflecting discrimination against the group of imported products. In doing so, panels must carefully scrutinize the particular circumstances of the case, that is, the design, architecture, revealing structure, operation, and application of the technical regulation at issue, and, in particular, whether that technical regulation is evenhanded, in order to determine whether it discriminates against the group of imported products (Appellate Body Report, *US – Clove Cigarettes*, paras. 180-182).

In the end, the Appellate Body agreed with the panel's conclusion that, by exempting menthol cigarettes from the ban on flavoured cigarettes, the US measure accords to clove cigarettes imported from Indonesia less favourable treatment than that accorded to domestic like products, within the meaning of Article 2.1 of the *TBT Agreement*. The Appellate Body considered that the detrimental impact of the US measure on competitive opportunities for clove cigarettes did not stem from a legitimate regulatory distinction because menthol cigarettes have the same product characteristics (the flavour that masks the harshness of tobacco) that, from the perspective of the stated objective of the US measure, justified the prohibition of clove cigarettes.

However, the Appellate Body sought to clarify that its ruling did not mean that WTO members “cannot adopt measures to pursue legitimate health objectives such as curbing and preventing youth smoking”. It emphasized that, even though the measure at issue pursued the legitimate objective of reducing youth smoking by banning cigarettes containing flavours and ingredients that increase the attractiveness of tobacco to youth, “it does so in a manner that is inconsistent with the national treatment obligation in Article 2.1 of the *TBT Agreement* as a result of the exemption of menthol cigarettes, which similarly contain flavours and ingredients that increase the attractiveness of tobacco to youth, from the ban on flavoured cigarettes” (Appellate Body Report, *US – Clove Cigarettes*, paras. 226 and 236).

The Appellate Body also addressed a claim under Article 2.1 of the TBT Agreement in *US – Tuna II (Mexico)*. The likeness of tuna products of different origins was not appealed. The debate on Article 2.1 thus was limited to the “treatment no less favourable” element of Article 2.1. The Appellate Body began by explaining that technical regulations are measures that, by their very nature, establish distinctions between products according to their characteristics or their related processes and production methods. Therefore, Article 2.1 should not be read to mean that any distinctions, in particular ones that are based exclusively on particular product characteristics or on particular processes and production methods, would *per se* constitute “less favourable treatment” (para. 211).

The Appellate Body described the analysis of whether there is less favourable treatment under Article 2.1 as involving the following two steps: (i) an assessment of whether the technical regulation at issue modifies the conditions of competition to the detriment of the imported product as compared to the domestic like product or the like product originating in another member; and (ii) a determination of whether the detrimental impact reflects discrimination against the imported product of the complaining member.

Referring back to its earlier ruling in *US – Clove Cigarettes*, the Appellate Body explained that the existence of a detrimental effect is not sufficient to demonstrate less favourable treatment under Article 2.1; instead, a panel must further analyse whether the detrimental impact on imports stems exclusively from a legitimate regulatory distinction rather than reflecting discrimination against the group of imported products (paras. 215 and 231). The Appellate Body further said that in this case it would scrutinize in particular, whether, in the light of the factual findings made by the panel and undisputed facts on the record, the US measure is evenhanded in the manner in which it addresses the risks to dolphins arising from different fishing methods in different areas of the ocean (para. 232).

Turning to the US “dolphin-safe” labelling provisions, the Appellate Body first found that the panel’s factual findings “clearly establish that the lack of access to the ‘dolphin-safe’ label of tuna products containing tuna caught by setting on dolphins has a detrimental impact on the competitive opportunities of Mexican tuna products in the US market” (para. 235). As for the question of whether the detrimental impact reflected discrimination, the Appellate Body examined whether the different conditions for access to a “dolphin-safe” label are “calibrated” to the risks to dolphins arising from different fishing methods in different areas of the ocean, as the United States had claimed. The Appellate Body noted the panel’s finding that, while the US measure fully addresses the adverse effects on dolphins (including observed and unobserved effects) resulting from setting on dolphins in the Eastern Tropical Pacific, it does not address mortality arising from fishing methods other than setting on dolphins in other areas of the ocean. In these circumstances, the Appellate Body found that the measure at issue is not even-handed in the manner in which it addresses the risks to dolphins arising from different fishing techniques in different areas of the ocean. On this basis, the Appellate Body reversed the panel’s finding that the US “dolphin-safe” labelling provisions are not inconsistent with Article 2.1 of the TBT Agreement, and found, instead, that the US measure is inconsistent with Article 2.1.

The Appellate Body reports in *US – Clove Cigarettes and US – Tuna II (Mexico)* focused on Article 2.1 of the TBT Agreement; the Appellate Body addressed Article III:4 of the GATT only as relevant context for its interpretation of Article 2.1 of the TBT Agreement. Nevertheless, the reports have given rise to debate about their implications for the analysis under Article III:4 of the GATT (see the International Economic Law and Policy Blog at: <http://worldtradelaw.typepad.com>).

As noted earlier, the TBT Agreement and the GATT are structured differently. The GATT includes a general exceptions provision (Article XX) that may be invoked to justify a measure that is otherwise inconsistent with Article III:4 (or another obligation in the GATT). Article XX refers to some of the policy objectives that are also mentioned in the Preamble of the TBT Agreement, such as the protection of the environment. The Appellate Body observed, in this regard, that while the GATT and the TBT Agreement seek to strike a similar balance, “in the GATT 1994 this balance is expressed by the national treatment rule in Article III:4 as qualified by the exceptions in Article XX, while, in the TBT Agreement, this balance is to be found in Article 2.1 itself, read in the light of its context and of its object and purpose” (Appellate Body Report, *US – Clove Cigarettes*, para. 109). This could be read by some as supporting a different approach under Article III:4 than under Article 2.1 of the TBT Agreement, whereupon any legitimate policy basis for the differential treatment of the imported product and the

like domestic product would be considered in the assessment of the Article XX defence and not as part of the assessment of whether there is discrimination under Article III:4.

Another point to note is that Article XX of the GATT has a closed list of policy reasons that could be invoked to justify an otherwise GATT-inconsistent measure. By contrast, the TBT Agreement does not expressly limit the policy objectives that could be pursued through a technical regulation. The range of objectives that could justify a measure is potentially more “open” under the TBT Agreement than under the GATT.

Appellate proceedings in *US – COOL* had not concluded at the time of writing.

(ii) *Appropriate level of protection*

Like Article III of the GATT, the SPS and TBT agreements do not establish minimum or maximum levels of regulatory protection. For example, the SPS Agreement does not require a WTO member to regulate in relation to a particular risk. Thus, a WTO member may choose not to regulate at all. At the same time, the SPS Agreement does not impose a ceiling on the maximum level of regulation. The Appellate Body has emphasized in this regard that it is the “prerogative” of a WTO member to determine the level of protection that it deems appropriate (Appellate Body Report, *Australia – Salmon*, para. 199).

Although WTO members have the prerogative to determine their level of protection, they must comply with the requirement of consistency in Article 5.5 of the SPS Agreement. An SPS measure would fail the consistency requirement of Article 5.5 if: (i) the member imposing the disputed measure has adopted its own appropriate levels of sanitary protection against risks to human life or health in several different situations; (ii) those levels of protection exhibit arbitrary or unjustifiable differences (“distinctions” in the language of Article 5.5) in their treatment of different situations; and (iii) the arbitrary or unjustifiable differences must result in discrimination or a disguised restriction of international trade. The analysis under Article 5.5 proceeds, however, only if the situations exhibit different levels of protection and present some common element or elements sufficient to render them comparable (Appellate Body Report, *EC – Hormones*, paras. 214-215 and 217).

(iii) *Scientific or technical basis*

The SPS Agreement requires that SPS measures be based on scientific principles and not be maintained without scientific evidence. Unless the SPS measure is taken in an emergency or is based on an international standard, it must be based on a risk assessment, which the Agreement defines as:

“The evaluation of the likelihood of entry, establishment or spread of a pest or disease within the territory of an importing Member according to the sanitary or phytosanitary measures which might be applied, and of the associated potential biological and economic consequences; or the evaluation of the potential for adverse effects on human or animal health arising from the presence of additives, contaminants, toxins or disease-causing organisms in food, beverages, or feedstuffs”.

TBT measures may also be supported by scientific or technical studies, although in some cases the scientific or technical information may be one of several factors taken into consideration. Indeed, Article 2.2 of the TBT Agreement includes available scientific and technical information among the elements that may be considered in assessing the risks that would be created if the legitimate objective pursued by the technical regulation were not fulfilled. While it is feasible to consider technical studies providing backing for the need for certain technical regulations relating to consumer safety, the usefulness of technical studies for other technical regulations – such as certain labelling requirements for foods subject to religious restrictions – is less obvious. The drafters of the TBT Agreement would appear to have foreseen that such measures could involve complex technical assessments in that they explicitly provided for the possibility that panels reviewing such measures in WTO dispute settlement could rely on experts “to assist in questions of a technical nature” (see Article 14 and Annex 2 of the TBT Agreement).

The additional requirements of the SPS and TBT agreements have given rise to concerns by some that the WTO will interfere with legitimate democratic choices of the citizens of the WTO members adopting the SPS or TBT measures. Writing about the SPS Agreement, Howse (2000) has argued that these requirements “do not have the effect of usurping democratic judgment about risk and its regulation and placing these matters under the authority of ‘science’”. Rather, in his view, “the SPS Agreement brings science in as one necessary component of the regulatory process, without making it decisive”. Howse finds support for his views in the approach taken by the Appellate Body in *EC – Hormones*. He refers, for example, to the Appellate Body’s acknowledgment that WTO members may adopt SPS measures even if scientific opinion is divided or there is uncertainty.

Sykes (2006) is less optimistic. He has argued that accommodation between the SPS Agreement’s scientific evidence requirement and respect for WTO members’ regulatory sovereignty “is exceedingly difficult if not impossible”. In his view, “(m)eaningful scientific evidence requirements fundamentally conflict with regulatory sovereignty in all cases of

serious scientific uncertainty". He sees this as forcing a choice on the WTO "between an interpretation of scientific evidence requirements that essentially eviscerates them and defers to national judgments about 'science', or an interpretation that gives them real bite at the expense of the capacity of national regulators to choose the level of risk that they will tolerate". A middle ground is only possible "in the rare cases where scientific uncertainty is remediable quickly at low cost".

Hoekman and Trachtman (2010) have argued that the scientific evidence requirement of the SPS Agreement does not entail a dramatic departure from the general policy of the GATT of preventing discriminatory measures (understood narrowly as only covering measures that have a differential impact without an adequate rational justification in terms of achieving a legitimate regulatory objective). They assert that the scientific evidence requirement may be understood as an objective indicator or "proxy measure" of protectionist intent. Hoekman and Trachtman explain that the scientific evidence requirement (including the requirement that SPS measures be based on a risk assessment) would seem to evaluate directly "the extent and quality of the non-protectionist aim". Alternatively, the requirement may be understood to establish a presumption of protectionist aim where the SPS measure is found not to be based on scientific evidence. Described in this manner, the scientific evidence requirement would be mostly concerned with the problem of policy substitution.

The concern about intruding into the regulatory domain of national governments on such sensitive matters as health and safety measures finds reflection in the "standard of review" that applies to the review of such measures by the WTO's adjudicatory bodies. The standard of review refers to the intensity of the scrutiny of domestic measures by WTO panels. As noted above, SPS measures must be based on scientific principles and may not be maintained without sufficient scientific evidence. This sometimes means that the WTO member applying the SPS measures must have conducted a risk assessment in accordance with Article 5.1 of the SPS Agreement.

A panel assessing the consistency of an SPS measure with Article 5.1 is meant to review the WTO member's risk assessment and not to conduct one itself. The Appellate Body has cautioned that "[w]here a panel goes beyond this limited mandate and acts as a risk assessor, it would be substituting its own scientific judgment for that of the risk assessor and making a *de novo* review and, consequently, would exceed its functions under Article 11 of the DSU". It went on to explain that "the review power of a panel is not to determine whether the risk assessment undertaken by a WTO Member is correct, but rather to determine whether that risk assessment is supported by coherent

reasoning and respectable scientific evidence and is, in this sense, objectively justifiable" (Appellate Body Report, *US/Canada – Continued Suspension*, para. 590).

It could be suggested that a deferential standard of review, similar to that applied to the review of SPS measures, would be justified in relation to measures under the TBT Agreement that are based on some kind of technical assessment carried out by domestic authorities. So far, however, the standard of review has not received much attention in the disputes brought to the WTO under the TBT Agreement.

A related issue that has been raised in connection with both the SPS and TBT agreements is whether WTO adjudicators have the required level of expertise to adjudicate disputes that may involve complex scientific or technical debates. The lack of such scientific and technical expertise is one of the justifications given for a deferential standard of review. The SPS and TBT agreements both provide for the possibility that panels seek advice from experts and several panels have done so. Panels must consult the parties when choosing the experts and must respect the parties' due process rights. Thus, a panel was faulted for consulting two experts that had participated in the evaluation of six hormones for purposes of developing international standards when the adequacy of that evaluation was an issue in the WTO dispute (Appellate Body Report, *US/Canada – Continued Suspension*, para. 481).

Moreover, experts cannot do the job of the parties, especially the complainant who bears the burden of proof (Appellate Body Report, *Australia – Salmon*, para. 222). The use of experts must be consistent with the standard of review. In the case of SPS measures, the consultations with the experts "should not seek to test whether the experts would have done a risk assessment in the same way and would have reached the same conclusions as the risk assessor" (Appellate Body Report, *US/Canada – Continued Suspension*, para. 481). In other words, the assistance of the experts is constrained by the applicable standard of review.

(iv) A less trade-restrictive requirement

As noted earlier, a WTO member taking a domestic measure that is inconsistent with one of the obligations of the GATT nevertheless may be able to justify it if the measure pursues one of the policy objectives recognized under Article XX and is otherwise consistent with the other requirements of that provision. Article XX allows, among other things, measures that are "necessary" to protect public morals or to protect human, animal or plant life or health. Under the approach followed by some panels during the GATT, a measure would be considered to be "necessary" only if there were no alternative measures

consistent with the GATT, or less inconsistent with it, that the member taking the measure could be expected to employ to achieve the relevant policy objective (see GATT Panel Report, *US – Section 337 Tariff Act*, para. 5.26 and GATT Panel Report, *Thailand – Cigarettes*, para. 75).

The Appellate Body has taken a more nuanced approach to necessity. The determination of “necessity”, as articulated by the Appellate Body, involves a weighing and balancing of the relative importance of the interests or values furthered by the challenged measure and other factors, which would usually include the contribution of the measure to the realization of the ends pursued by it and the restrictive impact of the measure on international trade. If this analysis yields an affirmative conclusion, the necessity of the measure must be then confirmed by comparing the measure with possible less restrictive alternatives. The burden of identifying less restrictive alternatives is on the complaining party. To qualify as an alternative, the measure must allow the respondent member to achieve the same level of protection and must be reasonably available – the responding member must be capable of taking it and the measure may not impose an undue burden on that member, such as prohibitive costs or substantial technical difficulties – taking into account the level of development of the member concerned (Appellate Body Report, *Brazil – Retreaded Tyres*, paras. 143 and 156).

In accordance with Article 5.6 of the SPS Agreement, a WTO member establishing or maintaining SPS measures to achieve the appropriate level of sanitary or phytosanitary protection must “ensure that such measures are not more trade-restrictive than required to achieve their appropriate level of sanitary or phytosanitary protection, taking into account technical and economic feasibility”. Footnote 3 to Article 5.6 clarifies that “a measure is not more trade-restrictive than required unless there is another measure, reasonably available taking into account technical and economic feasibility, that achieves the appropriate level of sanitary or phytosanitary protection and is significantly less restrictive to trade”. The assessment described in footnote 3 could be understood as a type of cost-benefit analysis.

In *Australia – Salmon*, the Appellate Body stated that Article 5.6 provides a three-pronged test. The complaining party must prove that there is another measure that: (i) is reasonably available, taking into account technical and economic feasibility; (ii) achieves the member’s appropriate level of sanitary or phytosanitary protection; and (iii) is significantly less restrictive to trade than the SPS measure contested. These three elements are cumulative in the sense that, to establish an inconsistency with Article 5.6, all of them have to be met:

“If any of the elements is not fulfilled, the measure in dispute would be consistent with Article 5.6. Thus, if there is no alternative measure available, taking into account technical and economic feasibility, or if the alternative measure does not achieve the Member’s appropriate level of sanitary or phytosanitary protection, or if it is not significantly less trade-restrictive, the measure in dispute would be consistent with Article 5.6” (Appellate Body Report, *Australia—Salmon*, para. 194).

In *Australia – Apples*, the Appellate Body added that, in determining whether the first two of these conditions have been satisfied (whether there is a measure that is reasonably available, taking into account technical and economic feasibility, and achieves the member’s appropriate level of sanitary or phytosanitary protection), a panel must focus its assessment on the proposed alternative measure. Only in examining whether the third condition is fulfilled will a panel need to compare the proposed alternative measure with the contested SPS measure (Appellate Body Report, *Australia – Apples*, WT/DS367/AB/R, at para. 337).

Marceau and Trachtman (2009) suggest that Article 5.6 of the SPS Agreement, as interpreted, would seem to involve a balancing exercise similar to the one espoused by the Appellate Body in relation to the assessment of necessity under Article XX of the GATT. One difference they identify is that, unlike the assessment of necessity under Article XX of the GATT, the evaluation under Article 5.6 of the SPS Agreement would not include consideration of the degree of the measure’s contribution to the end pursued.

For its part, Article 2.2 of the TBT Agreement provides that “Members shall ensure that technical regulations are not prepared, adopted or applied with a view to or with the effect of creating unnecessary obstacles to international trade. For this purpose, technical regulations shall not be more trade-restrictive than necessary to fulfil a legitimate objective, taking account of the risks non-fulfilment would create. Such legitimate objectives are, *inter alia*: national security requirements; the prevention of deceptive practices; protection of human health or safety, animal or plant life or health, or the environment. In assessing such risks, relevant elements of consideration are, *inter alia*: available scientific and technical information, related processing technology or intended end-uses of products”.

The panels in *US – Clove Cigarettes*, *US – Tuna II (Mexico)* and *US – COOL* each addressed and interpreted Article 2.2 of the TBT Agreement. Despite the differences in the panels’ analyses, there are some common elements that can be discerned in their approaches.

All three panels interpreted this provision as requiring an enquiry regarding the following elements: (i) whether the measure at issue pursues a legitimate objective; (ii) whether the measure at issue fulfils, or contributes to the achievement of, the legitimate objectives, at the level the member deemed appropriate; and (iii) whether there is a less trade-restrictive alternative means of achieving the same level of protection. Moreover, in all three disputes, the United States, as the respondent, consistently argued that the jurisprudence relating to Article XX of the GATT 1994 was not relevant in interpreting Article 2.2 of the TBT Agreement, and that instead panels should rely on Article 5.6 of the SPS Agreement and its jurisprudence (see above). None of the three panels accepted the US argument *in toto*. Rather, they drew upon the Appellate Body's jurisprudence on Article XX of the GATT 1994 in varying degrees, for their analysis under Article 2.2. The panels in *US – Tuna II (Mexico)* and *US – COOL* also relied on Article 5.6 of the SPS Agreement and its related jurisprudence in interpreting Article 2.2.

The three panels, however, adopted different standards for the individual elements of the test. For the panel in *US – Clove Cigarettes*, the first step under an Article 2.2 analysis requires an examination of whether the measure itself is necessary to fulfil the legitimate objectives. Borrowing from the Appellate Body's interpretation of "necessary" under Article XX of the GATT 1994, the panel observed that a measure must make a "material contribution" to the fulfilment of the legitimate objective for it to be considered "necessary" for the purposes of Article 2.2.

Having found that Indonesia failed to demonstrate that the US measure at issue makes no "material contribution" to the stated objective, the panel turned to the second stage of its analysis – the identification of a less trade-restrictive alternative – adopting the test developed by the Appellate Body under Article XX(b) in *Brazil – Retreaded Tyres*. The panel concluded that Indonesia, by "merely" listing two dozen possible alternatives, had failed to establish a *prima facie* case. Moreover, relying again on the Appellate Body Report in *Brazil – Retreaded Tyres*, the panel said that even if a *prima facie* case was established, the United States rebutted it by highlighting that several of the alternatives proposed were already in place in the United States.

The panel in *US – Tuna II (Mexico)* adopted a different approach. In its view, Article 2.2 does not require that the measure itself be necessary for the fulfilment of the legitimate objective. Instead, it requires that the trade restrictiveness of the challenged measure be necessary for the fulfilment of the objective. The panel noted that Article 2.2 differs from Article XX(b) and (d) of the GATT 1994, which require that the measure be necessary. Despite this observation, as a first step, the panel embarked on an assessment of the manner in which, and the extent to which, the measures at issue

fulfil their legitimate objectives, taking into account the WTO member's chosen level of protection. Here, however, the panel's analysis differs from the one conducted by the panel in *US – Clove Cigarettes*, as it focused not on "material contribution", but on the "manner and extent" to which the US "dolphin-safe" labelling provisions fulfil the objectives identified by the United States.

Having found that the measures have the capability to contribute to the fulfilment of these objectives, the panel examined whether there is a less trade-restrictive alternative measure that achieves the same level of protection.

In *US – COOL*, the panel focused exclusively on whether the US measure fulfils its stated objective, even though its interpretation of Article 2.2 envisaged other steps to be assessed, such as an examination of whether the measure at issue is "more trade-restrictive" than necessary based on the availability of less trade-restrictive alternative measures that could equally fulfil the identified objective. Here too, the panel relied upon the Appellate Body's jurisprudence on Article XX, observing that a measure can be said to contribute to the achievement of its objectives when there is a "genuine relationship of ends and means" between the objective and the measure. However, having found that the measure does not fulfil the objective it had determined the United States to be pursuing through its measure, the panel did not assess the availability of less trade-restrictive alternative means of achieving that objective.

As noted above, the appellate proceedings in *US – Clove Cigarettes* have concluded. However, the panel's findings on Article 2.2 of the TBT Agreement were not appealed and thus were not addressed by the Appellate Body in that case.

The Appellate Body interpreted Article 2.2 of the TBT Agreement in *US – Tuna II (Mexico)*, describing the assessment required under that provision as follows. First, a panel must assess what objective(s) a member seeks to achieve by means of a technical regulation. In doing so, it may take into account the texts of statutes, legislative history, and other evidence regarding the structure and operation of the measure. A panel is not bound by a member's characterization of the objectives it pursues through the measure, but must independently and objectively assess them. Subsequently, the analysis must turn to the question of whether a particular objective is legitimate (para. 314). Moreover, a panel must consider whether the technical regulation "fulfils" an objective. This is a question concerned with the degree of contribution that the technical regulation makes towards the achievement of the legitimate objective. Consequently, a panel adjudicating a claim under Article 2.2 of the TBT Agreement must seek to ascertain to what degree, or if at all, the challenged

technical regulation, as written and applied, actually contributes to the legitimate objective pursued by the member.

The degree of achievement of a particular objective may be discerned from the design, structure and operation of the technical regulation, as well as from evidence relating to the application of the measure (para. 317). Furthermore, the assessment of “necessity” under Article 2.2 involves a relational analysis of the trade-restrictiveness of the technical regulation, the degree of contribution that it makes to the achievement of a legitimate objective, and the risks that non-fulfilment would create. In most cases, this would involve a comparison of the trade-restrictiveness and the degree of achievement of the objective by the measure at issue with that of possible alternative measures that may be reasonably available and less trade restrictive than the challenged measure, taking account of the risks that nonfulfilment would create. As clarified by the Appellate Body in previous appeals, the comparison with reasonably available alternative measures is a conceptual tool for the purpose of ascertaining whether a challenged measure is more trade restrictive than necessary.

The obligation to consider “the risks nonfulfilment would create” further suggests that the comparison of the challenged measure with a possible alternative measure should be made in the light of the nature of the risks at issue and the gravity of the consequences that would arise from non-fulfilment of the legitimate objective. This suggests a further element of weighing and balancing in the determination of whether the trade-restrictiveness of a technical regulation is “necessary” or, alternatively, whether a possible alternative measure, which is less trade restrictive, would make an equivalent contribution to the relevant legitimate objective, taking account of the risks that non-fulfilment would create, and would be reasonably available (paras. 318-321).

As regards the measure challenged by Mexico under Article 2.2, the Appellate Body reversed the panel's finding that Mexico had demonstrated that the US “dolphin-safe” labelling provisions are more trade restrictive than necessary to fulfil the United States’ legitimate objectives. In doing so, the Appellate Body reasoned, *inter alia*, that the panel had conducted a flawed analysis and comparison between the challenged measure and the alternative measure proposed by Mexico (the co-existence of the labelling rules in the Agreement on the International Dolphin Conservation Program and the US labelling provisions). The Appellate Body also noted that the alternative measure proposed by Mexico would not make an equivalent contribution to the United States’ objectives as the US measure in all ocean areas. On this basis, the Appellate Body reversed the panel's finding that the measure is inconsistent with Article 2.2 of the TBT Agreement (paras. 328-331).

Appellate proceedings in *US – COOL* remain pending at the time of writing.

Sykes (2003) has suggested that the least trade-restrictive requirement is a “crude” form of cost-benefit analysis that is “highly attentive to error costs and uncertainty”. He describes it as “crude” because there is no actual quantification of the costs and benefits of alternative regulatory policies in monetary terms or using another metric. Instead, he portrays the WTO decision-maker as proceeding “more impressionistically and qualitatively” when assessing the trade effect of alternative policies, their administrative difficulties and resource costs, and their regulatory efficacy. Sykes reviews WTO dispute decisions up to 2003 as well as earlier GATT panels, and finds that they support his understanding of the less trade-restrictive requirement as a “crude” form of cost-benefit analysis.

Bown and Trachtman (2009) are critical of the Appellate Body's articulation of the necessity test and its application in the *Brazil – Retreaded Tyres* dispute. They submit that the Appellate Body has shown itself unwilling to evaluate for itself, or require the panel to have done so, in any meaningful way the factors that are supposed to be weighed and balanced under its test. In the absence of such evaluation, the adjudicatory bodies effectively defer to the domestic authority. Bown and Trachtman ask whether this degree of deference satisfies the mandate of the WTO's adjudicatory bodies. As to which should be the proper test to apply in this context, Bown and Trachtman observe that the text of Article XX, in particular the term “necessary”, most naturally suggests a “least-treaty-inconsistent-alternative-reasonably-available” test, which in this context would call for a comparative analysis of whether there exists another measure that would achieve the same regulatory benefits as the challenged measure, while imposing lower trade-restriction costs, without excessive costs of implementation. Yet, on the assumption that the treaty text could be amended, Bown and Trachtman propose that a more appropriate approach would be one based on a welfare-economics analysis and they illustrate how this approach would proceed using the facts of the *Brazil – Retreaded Tyres* dispute.

Regan (2007) also criticizes the balancing test as articulated by the Appellate Body. Like Bown and Trachtman, Regan argues that the term “necessary” in Article XX suggests a “less-restrictive alternative test”. Regan goes on to argue that, while the Appellate Body has described its approach as one involving weighing and balancing, it is in reality deciding cases on the basis of a less-restrictive alternative test. One of the reasons that he gives for arriving at this conclusion is that he considers that there is an inherent inconsistency between a balancing test and the view also espoused by the Appellate Body that WTO members are entitled to determine for themselves their appropriate level of protection.

Regan has what he considers is a more important objection. He does not believe that the WTO adjudicatory bodies have the authority to judge the relative importance of various (non-protectionist) goals that WTO members might wish to pursue and considers that, if this were indeed done, it would be a serious intrusion into members' regulatory autonomy. Regan explains that the advantage of a "less restrictive alternative" test – the test he thinks the Appellate Body has actually applied – is that it does not require making such judgments, but rather is limited to balancing the trade costs against administrative/enforcement costs (as opposed to the achievement of the underlying goal).

(v) *International standards*

As discussed in Section E.1 and Section E.2, regulatory divergence may result in higher costs for producers, exporters and importers. The WTO is not a standard-setting body. The principal means through which the WTO promotes regulatory convergence is by encouraging its members to use international standards. Neither the TBT Agreement nor the SPS Agreement, however, requires a WTO member to use international standards. WTO members may adopt SPS measures or technical regulations that depart from international standards.

Article 3.1 of the SPS Agreement provides that "to harmonize sanitary and phytosanitary measures on as wide a basis as possible, Members shall base their sanitary or phytosanitary measures on international standards, guidelines or recommendations, where they exist". Article 3.3, however, allows WTO members to introduce SPS measures which result in a higher level of SPS protection than would be otherwise achieved by measures based on international standards, provided that there is scientific justification or as a consequence of the level of SPS protection that a member determines to be appropriate.

The legal incentive for harmonization is that, under Article 3.2 of the SPS Agreement, measures based on international standards are deemed to be necessary to protect human, animal or plant life or health and presumed to be consistent with the relevant provisions of the SPS Agreement and the GATT. Yet, it is important to note that, even where a WTO member chooses not to base its SPS measure on an international standard, no negative presumption attaches to that measure. If the measure is challenged in WTO dispute settlement, the complaining member must demonstrate that the measure is inconsistent with the SPS Agreement. It is not enough to show that the SPS measure is not based on the international standard (Appellate Body Report, *EC – Hormones*, paras. 102 and 171).

In the case of technical regulations, Article 2.4 of the TBT Agreement provides that where "relevant international standards exist or their completion is

imminent", WTO members "shall use them, or the relevant parts of them, as a basis for their technical regulations". Nevertheless, Article 2.4 allows WTO members to depart from an international standard, even when such a standard already exists, if "such international standards or relevant parts would be an ineffective or inappropriate means for the fulfilment of the legitimate objectives pursued, for instance because of fundamental climatic or geographical factors or fundamental technological problems".

Similarly to SPS measures, there is a legal incentive for using an international standard in preparing a technical regulation. Article 2.5 of the TBT Agreement states that, where the technical regulation pursues one of the legitimate objectives recognized under the Agreement and is in accordance with relevant international standards, it shall be rebuttably presumed not to create an unnecessary obstacle to international trade. As with SPS measures, there is no negative presumption when a WTO member chooses not to use an international standard as a basis for a technical regulation. If that technical regulation is challenged in WTO dispute settlement, the complaining member must demonstrate that the international standard or relevant parts would be effective or appropriate means for the fulfilment of the legitimate objectives pursued (Appellate Body Report, *EC – Sardines*, para. 275).

The SPS Agreement expressly recognizes three international standard-setting bodies: the Codex Alimentarius Commission, the International Office of Epizootics (now called the World Organization for Animal Health – OIE) and the Secretariat of the International Plant Protection Convention (IPPC). For matters not covered by these three organizations, the SPS Agreement leaves open scope for "appropriate standards ... promulgated by other relevant international organizations open for membership to all Members, as identified" by the WTO's SPS Committee.

The TBT Agreement does not specify which bodies may issue "relevant international standards". The subject of "naming" or not naming bodies under the TBT Agreement has come up for discussion in the context of on-going negotiations in the Doha Round on non-agricultural market access. Here, the WTO membership is divided into two camps but for now the bodies are not listed.

One group of WTO members argues that relevant international standardizing bodies should be explicitly named. Since the goal of the TBT Agreement itself is one of promoting harmonization, this very objective, it is argued, will be impeded if multiple standard-setting organizations co-exist, creating duplicative and possibly contradictory requirements. In a context where regulators are strongly encouraged to base their measure on international standards, competition between standard-setting bodies will lead to

fragmentation of markets, unnecessary compliance costs and even capture of regulators by protectionist interests. The opposite needs to be achieved: close cooperation, greater inclusiveness and sharing of governance at the international level. Focusing the development of standards used for regulatory purposes within a few international bodies will incentivize a broad participation by stakeholders, in particular industry, thus ensuring market relevance and reflecting technological developments (JOB/MA/81 and JOB/MA/80).

It is further argued that naming the relevant international standard-setting bodies would facilitate participation by developing countries because these countries will be better able to prioritize scarce resources. Following on from this, an increase in participation by developing countries will help ensure that standards reflect the widest interests possible, thus providing greater legitimacy and global relevance to the international standard itself (JOB/MA/81 and JOB/MA/80).

Another group of WTO members argues the opposite: international standardizing bodies should not be named because whether a standard is relevant, effective and appropriate in fulfilling a member's particular regulatory or market need depends on the standard itself, not on the body that developed the standard. They argue that Article 2.4 of the TBT Agreement links the relevance of a "standard" to the objective pursued; the term "relevant" is not linked to the body. Furthermore, they suggest that by designating a particular body as a "relevant international standardizing body", WTO members would essentially be endorsing all standards that such bodies produce without reviewing their content, even in cases where the standard might not reflect the interests of all members, or, disproportionately reflects those of only a few (G/TBT/W/138).

It is also argued that a limited number of named bodies cannot produce the breadth and diversity of standards needed to fulfil all of the regulatory and market needs that are the purview of the TBT Agreement.³⁷ Instead, it is the diversity of bodies that will promote innovation and help ensure that standards are of high quality and respond to regulatory and market needs. Greater harmonization will result from increased use of such standards (G/TBT/W/138).

It is further argued that most bodies producing market-relevant standards (that are actually used) are private sector entities that need to cover their own costs through the sale of standards; naming bodies would eliminate this source of revenue and concentrate proceeds in a few hands. Finally, naming bodies would render any standard produced by a designated body as "relevant", regardless of whether that standard in fact responds to the needs of developing countries, and this would counteract the goal of promoting the

development of standards to meet the diverse needs of developing countries (G/TBT/W/138).

Despite these different views, neither "camp" disputes the importance of using international standards as a means of reducing unnecessary non-tariff measures, and all WTO members agree on the importance of adhering to the 2000 TBT Committee Decision that sets out six principles and procedures (Decision of the TBT Committee on Principles for the Development of International Standards, Guides and Recommendations with Relation to Articles 2, 5 and Annex 3, G/TBT/1/Rev.9, p. 38).³⁸ This Decision was recently recognized as having interpretative value as a "subsequent agreement" within the meaning of Article 31(3)(a) of the Vienna Convention on the Law of Treaties (Appellate Body Report, *US – Tuna II (Mexico)*, para. 372).

An issue that came up in WTO dispute settlement is whether an international standard had to be adopted by consensus in order to be a "relevant international standard" under Article 2.4 of the TBT Agreement. The Explanatory Note to the definition of "standard" in the TBT Agreement states that "standards prepared by the international standardization community are based on consensus". It then adds that the TBT Agreement "covers also documents that are not based on consensus". This language was interpreted in *EC – Sardines* as applying also to international standards. The Appellate Body confirmed the panel's finding that the definition of a "standard" in Annex 1.2 to the TBT Agreement does not require approval by consensus for standards adopted by a "recognized body" of the international standardization community.

The Appellate Body went on to clarify that its ruling was relevant only for the purposes of the TBT Agreement. Furthermore, it said that the ruling was not intended to affect, in any way, the internal requirements that international standard-setting bodies may establish for themselves for the adoption of standards within their respective operations. As the Appellate Body put it, "the fact that we find that the TBT Agreement does not require approval by consensus for standards adopted by the international standardization community should not be interpreted to mean that we believe an international standardization body should not require consensus for the adoption of its standards. That is not for us to decide" (Appellate Body Report, *EC – Sardines*, paras. 222 and 227).

The question of what constitutes an "international standard" for the purposes of the TBT Agreement was more recently discussed in *US – Tuna II (Mexico)*. The Appellate Body noted that, with respect to the type of entity approving an "international" standard, the ISO/IEC Guide 2: 1991 refers to an "organization", whereas Annex 1.2 to the TBT Agreement stipulates that a "standard" is to be approved by a "body". However, the Appellate Body observed that the TBT Agreement establishes that the definitions in that Agreement

prevail over the definitions in the ISO/IEC Guide 2: 1991. Consequently, the Appellate Body held that in order to constitute an “international standard”, a standard has to be adopted by an “international standardizing body” for the purposes of the TBT Agreement.

The Appellate Body further explained that a required element of the definition of an “international” standard for the purposes of the TBT Agreement is the approval of the standard by an “international standardizing body”, that is, a body that has recognized activities in standardization and whose membership is open to the relevant bodies of at least all WTO members. The Appellate Body additionally observed that the concept of “recognition” has both a factual and normative dimension. A body with “recognized activities in standardization” does not need to have standardization as its principal function, or even as one of its principal functions. At the same time, the factual dimension of the concept of “recognition” would appear to require, at a minimum, that WTO members are aware, or have reason to expect, that the international body in question is engaged in standardization activities. In examining whether an international body has “recognized activities in standardization”, evidence of recognition by WTO members as well as evidence of recognition by national standardizing bodies would be relevant. A standardizing body will be considered open if membership to the body is not restricted. The standardizing body must be open to the relevant bodies of at least all WTO members and on a non-discriminatory basis. Furthermore, it must be open at every stage of standards development.

Having provided its views on the definition of an “international standard” for the purposes of the TBT Agreement, the Appellate Body next considered whether the dolphin-safe definition and certification contained in the Agreement on the International Dolphin Conservation Program (AIDCP) qualified as one. The Appellate Body reversed the panel’s finding and held that AIDCP is not an “international standardizing body” for the purposes of the TBT Agreement because acceding to it requires an invitation by the parties, a decision that must be taken by consensus, and the Appellate Body was not persuaded that being invited to join is a mere “formality” (paras. 398-399).

The panel and Appellate Body reports in *US – Tuna II (Mexico)* also addressed the issue of whether the US dolphin-safe labelling measures constituted a technical regulation or a voluntary standard. The findings on this issue are discussed in Section E.3(vi).

(vi) *Regulating private conduct*

The WTO agreements primarily regulate government conduct. Nevertheless, as discussed in Section E.1, private conduct can sometimes have effects equivalent to those of a government-imposed non-tariff measure.

The intervention of some element of private conduct does not necessarily mean that a WTO member is relieved of its responsibility to comply with its obligations under the WTO agreements. Thus, for example, in *Korea – Various Measures on Beef*, there was a reduction in the number of retail outlets for imported beef that followed from decisions of individual retailers who could choose freely to sell the domestic product or the imported product. The Appellate Body, however, explained that the legal necessity of making a choice – between selling domestic or imported beef – was imposed by the government measures itself. In such circumstances, “the intervention of some element of private choice (did) not relieve Korea of responsibility under the GATT 1994 for the resulting establishment of competitive conditions less favourable for the imported product than for the domestic product” (Appellate Body Report, *Korea – Various Measures on Beef*, para. 146).

A similar situation arose in the recent *US – Tuna II (Mexico)* dispute, where the Appellate Body considered whether the detrimental impact on Mexican tuna products resulted from government intervention or was merely the effect of the private choice of US consumers. The Appellate Body held that the modification of the conditions of competition and, hence, the detrimental impact on Mexican tuna products resulted from the challenged US government measure – that is, the US “dolphin-safe” labelling provisions. It based its finding on the fact that it is the government measure that establishes the requirements under which a product can be labelled “dolphin-safe” in the United States. Moreover, while US consumers’ decisions whether to purchase dolphin-safe tuna products are the result of their own choices, it is the government measure that controls access to the label and circumscribes how consumers may express their preferences for “dolphin-safe” tuna products (para. 239).

The TBT Agreement makes some inroads into regulating non-governmental standard-setting bodies as a result of the commitments relating to the Code of Good Practice. The application of the Code to non-governmental standardizing bodies is explained in Section E.2.

Article 14.4 of the TBT Agreement is an interesting provision in terms of attribution to a WTO member of private conduct. It states that the dispute settlement provisions of the WTO can be invoked where a member has not achieved satisfactory results under certain provisions and the interests of another member are significantly affected. Article 14.4 goes on to state that “(i)n this respect, such results shall be equivalent to those as if the body in question were a Member”.

The SPS Agreement also requires WTO members to “take such reasonable measures as may be available to them to ensure that non-governmental entities

within their territories ... comply with the relevant provisions of this Agreement". It similarly states that members must not take measures which have the effect of, directly or indirectly, requiring or encouraging such non-governmental entities to act in a manner that is inconsistent with the Agreement.

Given their increasing use, private standards have become a subject of growing attention. The issue of private standards was first raised in the SPS Committee in 2005. Committee discussions on private standards initially focused on three themes: market access, development and WTO law. In the area of market access, WTO members differ in their views on whether standards are an opportunity or threat to exporters. Many members are concerned that the cost of certification, sometimes for multiple sets of standards for different buyers, can be a problem, especially for small-scale producers and particularly (but not exclusively) in developing countries. Members also have differing views as to whether private standards fall under the jurisdiction of the SPS Agreement. The concern that the proliferation of private standards could undermine some of the progress made in regulating SPS measures through the adoption and implementation of the SPS Agreement is at the root of these divergent views.

Despite the lack of consensus on whether and how private standards fit into the overall framework of the SPS Agreement, the issue has been on the agenda of every meeting of the SPS Committee since June 2005. In addition, the WTO Secretariat has organized two informal information sessions on the topic, and the Standards and Trade Development Facility, a global partnership that supports developing countries in implementing international SPS standards, held a workshop on the issue in 2008. The information sessions and workshop provided the opportunity for two-way education and awareness-raising: increasing the knowledge and understanding of government regulatory officials about the operation of various private standard schemes and their objectives, while at the same time making the operators of the private schemes aware of the concerns and effects of these on developing countries.

In March 2011, the SPS Committee agreed to pursue five practical actions recommended by an ad hoc working group³⁹ on the issue of private standards (see G/SPS/55 and G/SPS/R/62). While WTO members remain highly divided as to whether private standards legally fall within the scope of the SPS Agreement, the Committee agreed to develop a working definition of private standards related to SPS measures, and to limit any discussions to private standards identified in the definition. In addition, the Committee agreed that information regarding the work of the three international standard-setting organizations referenced in the SPS Agreement (Codex, IPPC and

OIE) as well as relevant developments in other WTO councils and committees should be regularly shared in the Committee. Members agreed to educate relevant private sector bodies in their countries so that they understand the issues raised in the SPS Committee and the importance of the international standards of Codex, IPPC and OIE. The Committee also agreed to explore cooperation with these three bodies in developing information material underlining the importance of international SPS standards.

As noted earlier, one of the distinctions drawn in the TBT Agreement between a technical regulation and a standard is that compliance with the former is mandatory, while compliance with the latter is not. The recent panel in *US – Tuna II (Mexico)* had to decide whether the US dolphin-safe labelling measures were "technical regulations" within the meaning of the TBT Agreement as argued by Mexico or rather a voluntary standard as advocated by the United States. The panel held that "compliance with product characteristics or their related production methods or processes is 'mandatory' within the meaning of Annex 1.1, if the document in which they are contained has the effect of regulating in a legally binding or compulsory fashion the characteristics at issue, and if it thus *prescribes* or *imposes* in a *binding* or *compulsory* fashion that certain product *must* or *must not* possess certain characteristics, terminology, symbols, packaging, marking or labels or that it *must* or *must not* be produced by using certain processes and production methods".

The panellists, however, disagreed as to whether the US measures are mandatory. The majority of the panel found that the US labelling requirement is mandatory because it (i) is legally enforceable and binding under US law (it is issued by the government and includes legal sanctions); (ii) prescribes certain requirements that must be complied with in order to make any claim relating to the manner in which the tuna contained in the tuna product was caught, in relation to dolphins; and (iii) embodies compliance with a specific standard as the exclusive means of asserting a "dolphin-safe" status for tuna products.

The dissenting panellist noted that "the measures do not impose a general requirement to label or not to label tuna products as 'dolphin-safe'. Rather, the use of the label "remains a voluntary and discretionary decision of operators on the market to fulfil or not fulfil the conditions that give access to the label, and whether to make any claim in relation to the dolphin-safe status of the tuna contained in the product". The panellist further determined that Mexico had failed to demonstrate that the measures were *de facto* mandatory, because Mexico had not established "the impossibility of marketing tuna products in the United States without the 'dolphin-safe' label" and that "such impossibility (arose) from facts sufficiently connected to the US dolphin-safe provisions or to another governmental action of the United States" (Panel Report, *US – Tuna II (Mexico)*, paras. 7.111-7.188).

The Appellate Body upheld the panel majority's finding that the US measure is a technical regulation subject to the disciplines of Article 2 of the TBT Agreement. The Appellate Body noted that the measure challenged by Mexico is composed of legislative, regulatory and judicial acts of the US federal authorities and includes administrative provisions. The measure sets out a single and legally mandated definition of a "dolphin-safe" tuna product and disallows the use of other labels on tuna products that use the terms "dolphin-safe", dolphins, porpoises or marine mammals that do not satisfy this definition. In doing so, the US measure prescribes in a broad and exhaustive manner the conditions that apply for making any assertion on a tuna product as to its "dolphin-safety", regardless of the manner in which that statement is made (para. 199).

(vii) Transparency

Transparency is an important element of all WTO agreements. Section E.2 described some of the most important transparency provisions of the SPS and TBT agreements, and explained the economic rationale of the exchange of information among WTO members.

Transparency obligations are not frequently the subject of WTO dispute settlement. However, in a recent case, *US – Clove Cigarettes*, a violation was found of Article 2.12 of the TBT Agreement, which provides that "(e) xcept in those urgent circumstances ..., Members shall allow a reasonable interval between the publication of technical regulations and their entry into force in order to allow time for producers in exporting Members, and particularly in developing country Members, to adapt their products or methods of production to the requirements of the importing Member". In paragraph 5.2 of the Doha Ministerial Decision, WTO members agreed that "the phrase 'reasonable interval' (in Article 2.12 of the TBT Agreement) shall be understood to mean normally a period of not less than 6 months, except when this would be ineffective in fulfilling the legitimate objectives pursued".

The *US – Clove Cigarettes* case concerned a technical regulation adopted by the United States that came into force three months after it had been published. An initial question that was raised in the case concerned the legal status of paragraph 5.2 of the Doha Ministerial Decision. The Appellate Body rejected the contention that paragraph 5.2 constituted a multilateral interpretation of the TBT Agreement adopted in accordance with Article IX:2 of the WTO Agreement. The reason for this was that paragraph 5.2 had not been adopted pursuant to a recommendation of the Council on Trade in Goods – the Council that supervises the TBT Agreement, as required by Article IX:2 of the WTO Agreement.

As the panel had done, the Appellate Body considered that paragraph 5.2 has interpretive value because it

constitutes a subsequent agreement between the parties, within the meaning of Article 31(3)(a) of the Vienna Convention on the Law of Treaties, on the interpretation of the term "reasonable interval" in Article 2.12 of the TBT Agreement. It then found that, read in the light of paragraph 5.2, Article 2.12 of the TBT Agreement "establishes a rule that 'normally' producers in exporting Members require a period of 'not less than 6 months' to adapt their products or production methods to the requirements of an importing Member's technical regulation".

The Appellate Body further explained that once it is shown that the WTO member adopting a technical regulation has not allowed a period of at least six months between the publication and the entry into force of that technical regulation, such a member carries the burden of demonstrating that a shorter period was justified because (i) the "urgent circumstances" referred to in Article 2.10 of the TBT Agreement surrounded the adoption of the technical regulation; (ii) producers of the complaining member could have adapted to the requirements of the technical regulation within the shorter interval that it allowed; or (iii) a period of "not less than" six months would be ineffective to fulfil the legitimate objectives of its technical regulation. In this particular case, it was found that the United States had failed to establish that any of the above-mentioned circumstances justified a period shorter than six months (Appellate Body Report, *US – Clove Cigarettes*, paras. 255, 268, and 290).

(c) Issues relating to the GATS

The principal disciplines on measures affecting trade in services are similar to those applying to non-tariff measures for goods trade. These services disciplines focus on MFN (Article II), market access (Article XVI) and national treatment (Article XVII). However, national treatment under the GATS is significantly different from that in goods trade, since it applies only to the sectors for which commitments have been taken, and can be made subject to limitations. Thus, the national treatment obligation in services cannot be viewed as a means to curb policy substitution. Rather, by requiring that limitations on market access and national treatment be subject to scheduling, the Agreement seeks to constrain the trade implications of these measures in the same way that tariffs are bound under the GATT.

The GATS has a very broad scope, which results from the four modes of supply that constitute trade in services. Moreover, unlike traditional trade agreements, the GATS is primarily concerned with internal measures. What matters in services trade is often the overall level of contestability of the market to new and existing entrants, and not just its openness to foreign suppliers. The breadth of the GATS is also reflected by the wide range of measures within its scope. In

accordance with Article I, the GATS “applies to measures by Members affecting trade in services”.

The Appellate Body has explained that the “use of the term ‘affecting’ reflects the intent of the drafters to give a broad reach to the GATS” (Appellate Body Report, *EC – Bananas III*, para. 220). The coverage of the GATS can extend as well to measures that are within the scope of the GATT. In the same case, the Appellate Body noted that, while some measures will fall under one or the other agreement, there may be measures that could be found to fall within the scope of both the GATT and the GATS. These would be “measures that involve a service relating to a particular good or a service supplied in conjunction with a particular good”. In such cases, “while the same measure could be scrutinized under both agreements, the specific aspects of that measure examined under each agreement could be different” (Appellate Body Report, *EC – Bananas III*, para. 221).

The policy substitution problem as discussed in Section E.2 between tariffs and non-tariff measures could in principle only exist for services if WTO members, having removed market access or national treatment limitations, were then to use domestic regulations as a substitute instrument. So far, domestic regulation disciplines under the negotiating mandate of Article VI:4 (see Section E.4) have yet to be defined. Pending those disciplines, members may not under Article VI:5 maintain domestic regulations on licensing, qualification and technical standards in a way that would nullify or impair specific commitments. These domestic regulations should also be based on objective and transparent criteria, not be more burdensome than necessary to ensure the quality of the service, and not have reasonably been expected at the time when the relevant commitments were made.

So far, WTO dispute settlement cases have not addressed Article VI:5, although there has been some guidance on other aspects of domestic regulation. The distinction drawn in the GATS between market access restrictions (Article XVI) and domestic regulations (Article VI) was examined in *US – Gambling*. The issue that arose was whether a ban on a means of supplying a service constituted a market access restriction under Article XVI:2(a) and (c), or whether such provisions covered only measures that were expressed in the form of a numeric value. The panel found that a ban is, in effect, a “zero quota”, and is therefore covered by these provisions. This finding was upheld on appeal (Panel Report, *US – Gambling*, paras. 224-239; Appellate Body Report, *US – Gambling*, para. 265).

The *Mexico – Telecoms* case demonstrated the close relationship between domestic regulation and competition policy. The measures at issue were

Mexico’s domestic laws and regulations that govern the supply of telecommunications services and federal competition laws. The panel found that the interconnection rates charged by Mexico’s major suppliers were not “cost-oriented”, as required by the non-discriminatory disciplines in the Reference Paper contained in Mexico’s schedule of commitments. Furthermore, the panel found that, with respect to its regulations on interconnection costs, Mexico had not taken appropriate measures to prevent “anti-competitive” practices, as it was required to do under the Reference Paper disciplines. The panel also found that US suppliers had not been provided access to public telecommunications transport networks on “reasonable terms”, contrary to Mexico’s obligations under the Annex on Telecommunications.

4. Adapting the WTO to a world beyond tariffs

This final section sketches some of the main challenges in dealing with non-tariff measures in the multilateral trading system. Sub-section (a) illustrates why improvements in the treatment of non-tariff measures in the WTO may become more important in light of rapid changes in the global economy (cross-border production chains) and the growing use of NTMs to address broad consumer and general interests, such as food safety and environmental quality.

Sub-section (b) focuses on the scope for policy flexibility in setting non-tariff measures in the theory and practice of non-violation complaints and of other approaches, such as mutual recognition and harmonization. Sub-section (c) takes up the current transparency provisions in the WTO and the challenge of aligning incentives when transparency has costs. Sub-section (d) focuses on addressing the challenge of distinguishing between legitimate and illegitimate uses of NTMs.

Sub-section (e) discusses policy challenges to international cooperation on non-tariff measures. In particular, it considers the issue of regulatory convergence, the development of rules on private standards, disciplines on domestic regulation and “pro-competitive” regulations in services. Sub-section (f) concludes with a focus on the need for regulatory capacity building in developing countries.

(a) NTMs in the 21st century

Recent changes and foreseeable changes in the trading environment alter both the need for non-tariff measures and the structure of government incentives to use these measures for protectionist purposes. The Report has discussed in detail the implications of diverse areas of economic change for NTMs, such as the diffusion of global production networks, difficulties

associated with the recent financial crisis and the need to address climate change. Some of the challenges are discussed below.

The rules of the GATT were designed for a world in which international trade predominantly consisted of trade in final goods and primary commodities. However, the modern economic environment has grown more complex as production networks span borders. These changes pose challenges for governance, as the kinds of problems that arise in a world of offshoring require rethinking the current market access based framework of the multilateral trading system.

As Antràs and Staiger (2011, 2012) have argued, deep rather than shallow integration is needed to solve the type of policy problems associated with the proliferation of global production chains. Specifically, the theory outlined in Section E.1(b) suggests that if producers are locked into trade relationships with foreign firms, governments must consider not only market access but also the upstream and downstream effects of their measures. One possibility to account for these needs is that WTO rules could be amended or reinterpreted to allow non-violation complaints to cover “intra-firm market access”. This would require expanding non-violation complaints to cover “benefits” accruing not only from the agreed market access, but from the range of policies that affect the bargaining relationship between the input supplier and the purchaser of those inputs. Such a change would necessitate significant departures from current practice and open challenging questions on institutional design. Part of the challenge lies in distinguishing between those situations in which industries set prices through bargaining rather than competitively. Trade rules would have to reflect such sectoral differences.

Little work on the theory of trade agreements under offshoring has attempted to evaluate the substantive importance of price formation through bargaining, making it difficult to determine the need for an institutional response (Staiger, 2012). As a first step towards a test of the theory, Section C.2 examines those sectors that have a higher share of trade in intermediate goods. While not identical to offshoring and bilateral bargaining, the presence of intermediate goods is indicative of the kinds of international supply chains that would be subject to bargaining over prices and therefore profits.

The statistical analysis finds, however, that the share of intermediate goods is negatively associated with the amount of trade covered by specific trade concerns (and by extension the amount of trade affected by non-tariff measures). This indicates either that the incentive to use NTMs to shift firm profits is dominated by other considerations (such as the desire to make an attractive environment for global production), or possibly that governments have already addressed this

issue in existing “deep integration” preferential trade agreements (see World Trade Organization (WTO), 2011). Even if PTAs promote deep integration, the challenge for the WTO is to ensure coherence among divergent regulatory regimes that in practice may segment markets and raise trade costs.

Changes in international markets do not only arise from differences in how businesses organize. It is also likely that the use of non-tariff measures will be responsive to a number of foreseeable trends in the global economic environment. Section B highlights three areas in which economic changes create new challenges for the regulation of NTMs. These are the way food is produced and consumed, the central role of international finance in the economy and in economic crises, and the fundamental challenges of climate change. Each of these factors is of concern for governments seeking to promote a regulatory environment that protects broad consumer and societal interests, which may however have an impact on trade.

The increasingly globalized agri-food system shows how organizing and regulating global supply chains involves business, government and consumer interests. Section B argues that as consumers’ standards rise, there is a greater need for businesses to manage their supply chains and for governments to ensure the desired level of quality and safety. This effort is complicated by the ever expanding internationalization of food production, and the difficulty in tracing products that change hands very quickly and traverse multiple jurisdictions.

International finance services are similarly complex and fast moving, but play a central role in the global economy. In this environment, challenges to financial markets threaten the stability of entire economies. When crises arrive, governments use a variety of measures to contain the systemic damage and to boost consumer demand. At the same time, economic crises are associated with increased demands for protectionist policies that stabilize the domestic economy at the expense of other countries, fuelling economic tension. This challenge is particularly relevant in light of the apparent institutional failures of the 2008 financial crisis and the subsequent global economic recession.

While the recession itself creates political challenges for international cooperation in general, the concentration and severity of the crisis in countries with sophisticated regulatory regimes and open capital accounts may derail efforts to harmonize regulations in the financial services sector. As financial services continue to make up a large portion of the economy of many countries, facilitating trade in these services may require additional mechanisms to coordinate crisis response.

Financial crises, while harmful, have happened before, and have limited lifespans. Climate change, on the other hand, causes both global and long-lasting effects. The discussion of climate change in Section B emphasizes the challenge of balancing legitimate concerns about carbon leakage with an equitable distribution of the costs of carbon dioxide abatement. As governments increasingly attempt to regulate carbon emissions, part of the discussion inevitably revolves around the trade implications of these measures.

(b) Policy flexibility: tensions between law and economics

When governments bind tariffs and commit to a level of market access, their partners may worry that measures to address domestic concerns may in fact circumvent the obligations in the agreement. One way that current rules of the WTO enable governments to employ public policy oriented measures is by allowing non-violation complaints, as described in Section E.1(c). Non-violation complaints allow WTO members to be “compensated” after one of their trading partners establishes a trade-altering non-tariff measure by withdrawing concessions to rebalance the level of market access. This remedy confers a high degree of domestic policy flexibility to WTO members, in line with their international commitments. It might serve to encourage confidence in the value of a trade negotiation and discourages governments from using NTMs to renege on commitments. In practice, however, WTO members generally do not invoke non-violation complaints in trade disputes.

Several reasons have been advanced to explain why complaints based on non-violation claims are rare. One is that the Uruguay Round agreements reduced the scope for non-violation cases because GATT/WTO law became “more and more comprehensive and complete”, shrinking “the legal vacuum around GATT ... in particular with respect to subsidization”, which was the target of most of the non-violation claims pursued during the GATT years (Kuijper, 1995). Another reason that has been put forward is that there remain a number of ambiguities concerning the elements that a complainant must satisfy for its claim of non-violation to succeed.

A non-violation complaint is usually understood to protect the expectations of a WTO member (“benefits accruing to it directly or indirectly under the relevant covered agreement”) (Roessler and Gappah, 2005). Nevertheless, questions have been raised as to precisely which expectations are protected and when those expectations can be said to have been frustrated. Finally, the remedy available when a non-violation complaint is successful is weaker than the remedies available in cases of violation. In the first case, the responding party is not under an obligation to withdraw the measure. Instead, the respondent member must “make a mutually satisfactory

adjustment”, which may include compensation (see Article 26(1) of the Dispute Settlement Understanding).

Under the Dispute Settlement Understanding (DSU), WTO members are not generally required to show that a non-tariff measure actually harms market access. Instead, members generally challenge the NTM on the basis of the specific rule it allegedly violates. There is, therefore, a tension between the economic framework, whereby rebalancing can be used to confer policy flexibility, and the legal framework which relies on “clear infringement” of a GATT provision. Moreover, the infringement principle exacerbates the problem regarding the asymmetric application of the non-violation rule described in Section E.1.

Ideally, a government could efficiently correct a domestic market failure by using a non-tariff measure without being accused of violating the agreement so long as this measure is balanced with a tariff adjustment so as not to alter overall concessions to trading partners. As interpreted, however, GATT rules preclude this form of readjustment. Addressing this asymmetry would, at a minimum, require reinvigorating the non-violation rules to cover market access, but several additional problems could arise. Staiger and Sykes (2011) indicate that a requirement to maintain balance in market access, while limiting policy substitution, would discourage economically desirable regulation for fear of sanctions by foreign governments. While this incentive could be limited by calibrating the allowed response, achieving balance would be difficult, particularly as the welfare effects of regulatory policy are often difficult to measure.

Increasingly, the WTO membership addresses non-tariff measures and domestic regulation in services by using one of two tools, harmonization or mutual recognition (discussed in Section D and Section E.1). Harmonization sets both common policy objectives and the measures needed to achieve them, while mutual recognition refers to the reciprocal acceptance of the measures applied in both countries.

In the policy areas covered by either kind of agreement, harmonization and mutual recognition reduce the discriminatory effects of non-tariff measures, but each has a different effect on trade. Section B argues that the economic theory on the relative trade effects of harmonization and mutual recognition does not indicate a general advantage of one rule over the other in terms of trade flows. Looking to actual practice, the empirical analysis in Appendix 5 of Section D indicates that mutual recognition provisions appear to be more trade enhancing than harmonization provisions.

Beyond the trade effects, Section E.1 indicates that governments may set looser than optimal regulations if a mutual recognition rule ensures access to foreign markets. This means that, even if trade is enhanced, there are potential consequences for consumer

welfare. Finally, Section E.1 also points to the potential trade-offs implied by harmonization of non-tariff measures whenever policy needs differ across developed and developing countries.

The asymmetry in the application of non-violation in the GATT/WTO system, the trade-offs implied by harmonization and mutual recognition and the ambiguity of their trade effects point to the difficulties that still persist in the multilateral trade regime in finding the right balance between policy commitments and flexibility. Beyond the issues discussed above, part of the complexities of this problem is tied to the opaque nature of many non-tariff measures and the difficulty in discerning the protectionist and the legitimate intent of governments. These challenges are discussed in more detail below.

(c) Transparency is no “free lunch”

Transparency is an important dimension of international cooperation on non-tariff measures and services measures. Previous parts of this report have shown that: (i) both NTMs and services measures raise transparency issues (see Section B); (ii) opacity imposes costs on certain firms but it may benefit others (import-competing firms) and, depending on circumstances, politically motivated governments may have a preference for opaque policy instruments over transparent ones (see Section B); (iii) available information on both NTMs and services measures is limited in coverage and of generally low quality (see Section C.1); (iv) international cooperation on NTMs and services measures is made more difficult by their opacity (see Section E.1); (v) a number of transparency provisions in the WTO agreements address the opacity problems (see Section C.1 and Section E.2). This sub-section examines whether existing transparency provisions address all the problems raised by the opacity of NTMs and services measures. It identifies a number of remaining challenges and points at possible solutions.

As discussed in Section E.1, the opacity of non-tariff measures and services measures raises four main problems for international trade cooperation which transparency provisions can help address. First, opacity creates rule-making inefficiencies due to regulatory uncertainties. Secondly, cooperation on NTMs or services measures can suffer because enforcement of agreements requires that the compliance of each government can be observed. Thirdly, if measures are opaque, an agreement may be only of limited use to correct governments' lack of commitment. Finally, transparency may induce or be part of a regulatory improvement process.

Four main types of transparency provisions have been developed over the years to address the problems outlined above (see Section C.1). Publication requirements, in GATT Article X, Article III of the GATS

and in other WTO agreements, are the oldest type of provision. Notifications are another core transparency mechanism, whose importance has substantially increased over the years. The WTO's Trade Policy Review Mechanism and its monitoring reports constitute a third mechanism. Finally, the possibility to raise specific trade concerns in the TBT and SPS committees (see Section C.1) and to some extent the dispute settlement mechanism represent a fourth.⁴⁰ The question is whether these four mechanisms ensure sufficient transparency to make cooperation possible.

The answer to this question is that transparency provisions in the WTO agreements help address the problems raised by the opacity of non-tariff measures and services measures but they are not sufficient. One problem is the failure of notifications, one of the pillars of the WTO transparency system, to provide the information they should. WTO members' compliance with certain notification requirements is low and the quality of the information notified is not always sufficient. As already mentioned, part of the reason for this appears to be that notifying can be difficult and costly.

Over the years, various measures have been taken to facilitate and enhance the quality of notifications. The SPS Committee, for example, has decided that it would be useful to be alerted when notified regulations are adopted or enter into force, and has recommended the use of addenda for this purpose. It has also been testing an electronic notifications mechanism to facilitate and improve the quality of notifications. Furthermore, notifications account for as much as 10-20 per cent of technical assistance activities. However, much remains to be done and compliance will most likely be difficult to improve without taking into account the political economy of transparency and notifications.

Contrary to what is often claimed, not everyone benefits from transparency. There are winners and losers from increased transparency. As has been argued in this report, governments may have reasons to prefer opaque measures and some firms may benefit from the higher market entry costs associated with opaqueness. This means that while every government is interested in its partners' measures, it may be reluctant to disclose information on its own measures. The temptation to free ride on the system clearly exists and, if they consider past records, governments may not be too afraid of sanctions for not complying with their notification obligations, except for some finger-pointing.

As for the possibility to use “reverse notifications”, it could help but has not been used very actively since the Uruguay Round.⁴¹ How much it could help depends on various factors. First, it is not clear how easy it is for a WTO member to identify another member's non-tariff measures. Secondly, members may be reluctant

to denounce trading partners for fear of retaliation. Thirdly, other mechanisms may have taken the place of reverse notifications.⁴²

If notifications fall short in terms of providing information, what about the WTO's Trade Policy Review Mechanism and its monitoring reports mentioned earlier? Both these transparency mechanisms rely on information from multiple sources and are thus less dependent on the disposition of the government imposing the measures. Trade policy reviews clearly represent an important transparency mechanism but frequency and comprehensiveness, in particular on the services side, are issues.⁴³

As for the monitoring reports, at the 8th WTO Ministerial Conference in December 2011, Ministers directed the monitoring mechanism to be continued and strengthened.⁴⁴ They have also committed to comply with existing transparency obligations and reporting requirements needed for the preparation of these monitoring reports, and to continue to support and cooperate with the WTO Secretariat in a constructive fashion. The questions that remain to be answered pertain to the quantity, quality and accessibility of the information collected for the monitoring reports. At this stage, it is not clear how comprehensive their coverage is, how much it could be expanded and whether and when it can be systematically coded and stored in a database.⁴⁵

Another mechanism which usefully complements notifications and the monitoring reports is the discussion of "specific trade concerns" in the SPS and TBT committees.⁴⁶ These discussions provide an opportunity for multilateral review that enhances the transparency and predictability of regulatory measures covered by the TBT and SPS agreements. Since the issues discussed relate to specific measures maintained by other WTO members, there is no incentive problem. Another advantage of this mechanism is that it covers concerns related not only to the measures themselves but also to their implementation.

There are two main limitations to the role that the discussion of specific trade concerns can play. First and foremost, only SPS and TBT measures are covered. Secondly, it is not clear that, even in the covered areas, all measures that violate commitments will be raised. For any concern to be raised, it first needs to be identified by an exporter. It then needs to be communicated to the government. Finally, the government needs to raise it at the WTO. This means that even if a concern is identified and communicated to the government, it may not be raised if, for example, the government is afraid of reprisal.

The challenge, at this juncture, is thus to improve the quantity, the quality, and the accessibility of information collected through active and passive transparency

mechanisms, both on measures and on problems associated with the measures. As far as the accessibility is concerned, the situation will improve significantly if and when all the information notified to, or collected by, the WTO Secretariat is made available through the recently launched Integrated Trade Intelligence Portal (I-TIP).⁴⁷

Improving the quantity and quality of information, however, is more difficult. Further work in the committees and through technical assistance will no doubt continue to help improve the contribution of the notification mechanism to transparency, but, given the incentive problem, this may not be enough. One option mentioned above is to empower the WTO Secretariat with the resources necessary to independently monitor governments and markets. Without a significant improvement in the compliance and quality of notifications, this would be a very costly option, which would have significant budgetary implications for the WTO. The mobilization of additional resources on a sustainable basis could raise incentive issues.

Another option, which has helped improve the transparency of tariffs, is to make it easier for WTO members to comply with their transparency obligations by allowing the WTO Secretariat to use other relevant official sources on a "no objection" basis, if such sources are available.⁴⁸ This option, however, will shift the incentive problem to other information-collecting agencies. Finally, a third option is for members to enter into bilateral and/or plurilateral negotiations over more enforceable transparency obligations in the same way that negotiations have taken place over the years to revamp existing rules or introduce new ones.

Depending on which option is adopted to address the incentive problem and to ensure that WTO mechanisms generate a sufficient level of transparency, reliance on external sources to fill information gaps may vary. It seems clear, however, that at least in the short run, the system will continue to benefit from other institutions' collection efforts. As discussed, the WTO Secretariat and other agencies have revamped the existing international classification to facilitate the integration of all available sources of non-tariff measure information. From this perspective, the multi-agency Transparency in Trade (TNT) initiative (see Section C) would have an important role to play in boosting the collection and dissemination of data on non-tariff measures and services measures.

The TNT initiative could be used by partners as an opportunity to put in place a sustainable governance mechanism for transparency in non-tariff measures. Such a governance mechanism would need to take into account the central role that the WTO should play in this area. It would rely primarily on multilateral and regional institutions. Regional secretariats and regional banks, such as the Latin American Integration Association (ALADI) or the African Development

Bank, have already made substantial contributions to the data collection efforts and the Inter-American Development Bank has expressed interest in both data collection and analytical work in the Western Hemisphere. Whatever the model adopted, it will require substantial capacity building and assistance in view of the technicalities. However, if incentives are properly taken into account, there is no fundamental reason why, in the long run, information on NTMs and services measures could not be collected and disseminated in the same way as equally sensitive information on other dimensions of trade policy.

(d) The importance of policy rationale

As described in Section E.3, WTO agreements seek to discipline measures that distort trade while recognizing WTO members' right to take measures that pursue legitimate public policies (on such matters as environmental protection, health, and consumer safety). Drawing the line between those measures that should be allowed and those that should be forbidden is often a difficult exercise both with non-tariff measures and domestic regulation in services.

The basic approach of the GATT is to allow domestic regulatory measures provided that they do not discriminate against the imported products (national treatment obligation). One of the challenges that has arisen in connection with national treatment concerns the relevance and weight to be given to the rationale or purpose of the measure. For several commentators, whether or not the regulatory measure has a protectionist rationale or purpose should be the decisive criterion in a determination of discrimination (Regan, 2003; Hudec, 1993).

Consideration of the rationale for measures is a less firmly settled approach in the jurisprudence of the Appellate Body, which has made it clear that the "broad and fundamental purpose of Article III is to avoid protectionism in the application of internal tax and regulatory measures" (Appellate Body Report, *Japan – Alcoholic Beverages II*, pp. 16-17).

The first sentence of Article III:2 concerns tax measures that discriminate between "like" products. It would appear that there would be little scope for consideration of the rationale for the measures under the Appellate Body's interpretation of this provision, according to which the provision is violated any time the imported product is taxed in excess of the like domestic product (Appellate Body Report, *Canada – Periodicals*, p. 19) The second sentence of Article III:2 concerns tax discrimination between directly competitive or substitutable products (a broader category than "like products" under the first sentence).

As a result of the cross-reference to Article III:1, the second sentence of Article III:2 has been interpreted to require the complaining party to show that the imported

and domestic competitive or substitutable products are not similarly taxed "so as to afford protection to the domestic industry". The Appellate Body clarified that the "so as to afford protection" requirement "is not an issue of intent", but rather "of how the measure in question is applied" (Appellate Body Report, *Japan – Alcoholic Beverages II*, pp. 27-28) At the same time, the Appellate Body said in the same case that "(a)lthough it is true that the aim of a measure may not be easily ascertained, nevertheless its protective application can most often be discerned from the design, the architecture, and the revealing structure of the measure" (Appellate Body Report, *Japan – Alcoholic Beverages II*, pp. 29). This reference to the "design, the architecture, and the revealing structure" of the measure has been understood by some as necessarily including considerations relating to the rationale for the measure.

Article III:4 concerns domestic regulatory measures. It does not include a cross-reference to Article III:1 and therefore the Appellate Body has said that "a determination of whether there has been a violation of Article III:4 does not require a separate consideration of whether a measure "afford(s) protection to domestic production" (Appellate Body Report, *EC – Bananas III*, para. 216). Article III:4 requires WTO members to accord imported products "no less favourable" treatment than that accorded to like products of national origin in respect of all domestic regulations. "No less favourable treatment", in turn, has been interpreted to mean that "the measure modify(ies) the conditions of competition in the relevant market to the detriment of imported products" (Appellate Body Report, *Korea – Various Measures on Beef*, para. 137).

In a subsequent case, *EC – Asbestos*, the Appellate Body made two statements that can be read as going in different directions as to the relevance of the rationale for the measure under Article III:4. On the one hand, the Appellate Body said that if there is less favourable treatment of the group of like imported products, there is conversely "protection" of the group of like products. This suggests that once a complainant has demonstrated that the conditions of competition have been modified to the detriment of the imported products (that is, "less favourable treatment"), there is no need to make a separate showing of protectionist intent. On the other hand, the Appellate Body added that "a Member may draw distinctions between products which have been found to be 'like', without, for this reason alone, according to the group of 'like' imported products 'less favourable treatment'" (Appellate Body Report, *EC – Asbestos*, para. 100). This statement has been understood by some as allowing for distinctions between imported and domestic products that are not motivated by protectionist purposes.

Another device that has been used in WTO dispute settlement to assist in distinguishing permissible non-tariff measures from impermissible ones is a balancing test. This test has been used in the context of

assessing a respondent member's assertion that its measure is justified under the general exceptions of Article XX of the GATT and particularly that the measure is "necessary" to protect human, animal or plant life or health under sub-paragraph (b).

As developed by the Appellate Body, the determination of "necessity" involves a weighing and balancing process that begins with an assessment of the relative importance of the interests or values furthered by the challenged measure, and also involves an assessment of other factors, which will usually include the contribution of the measure to the realization of the ends pursued by it and the restrictive impact of the measure on international trade. If this analysis yields a preliminary conclusion that a measure is necessary, this must be then confirmed by comparing the measure with possible less restrictive alternatives. The burden of identifying less restrictive alternatives is on the complaining party. Furthermore, in order to qualify as an alternative, the measure must allow the respondent member to achieve the same level of protection and must be reasonably available (Appellate Body Report, *Brazil – Retreaded Tyres*, paras. 143 and 156).

The relevance of the purpose of a measure for the assessment of discrimination and of the balancing test for assessing "necessity" have come up in three recent disputes under the TBT Agreement. As noted in Section E.3, in *US – Clove Cigarettes*, the Appellate Body interpreted Article 2.1 of the TBT Agreement as not prohibiting detrimental impact on imports that stems exclusively from a legitimate regulatory distinction (Appellate Body Report, *US – Clove Cigarettes*, paras. 180-182).

The economic theory reviewed in Section B has discussed a number of ways that can help to identify situations in which governments may be more likely to employ non-tariff measures for competitiveness reasons rather than the stated public policy rationale.⁴⁹ These include an analysis of the efficiency and incidence of the measure in question, and the wider sectoral and political context that may also inform the choice of a particular measure.

In Section B.1, it was found that assuming a particular public policy goal, different measures can be ranked in terms of their economic efficiency. Governments that fail to use the most efficient measure⁵⁰ may be subject to institutional and political pressures that encourage the adoption of measures for competitiveness reasons. For example, in order to provide assurance to consumers as to the presence or absence of certain characteristics of a product, a ban or a labelling scheme could be employed. Provided the characteristics are not particularly harmful, the latter is superior from an economic point of view, as it does not artificially limit consumer choice. In practice, the most efficient instrument may not always be easy to determine. It strongly depends on the particular public

policy concern and market conditions, and it is therefore difficult to establish a general ranking of alternative measures. Although quantitative restrictions rarely constitute a first-best policy, an import ban may be optimal if the costs of acquiring relevant information or the risks associated with consumption of the product are extraordinarily high.

The relative incidence of a public policy measure on consumers and producers at home and abroad can also be telling in respect of a possible competitiveness rationale. For instance, in Section B.2, it has been mentioned that profit-shifting in a situation of offshoring and bilateral bargaining might lead a government to change environmental taxes from their efficient levels in order to maximize national welfare, with the burden being shared between domestic consumers and foreign producers. In practice, the incidence of a policy may be difficult to measure, and it can be instructive to gather evidence on the demand for public policy instead in order to gauge the relative influence of domestic producers and to put trade effects into perspective.⁵¹

Certain features of the sector in question, while not mechanistically determining the prevalence of competitiveness objectives, can give an indication of circumstances under which a competitiveness-oriented policy benefitting the sector in question is more likely. The "protection for sale" literature reviewed in Section B.1⁵² has shown that the degree of lobbying and organization within a sector increases the likelihood of obtaining protectionist measures. Other relevant sector characteristics relate to the level of competition and consumer behaviour, as expressed for instance in the degree of import penetration and the level of responsiveness of demand to price changes, where lower levels are associated with higher levels of protection.⁵³

The new trade literature which emphasizes differences in firm characteristics (heterogeneous firm theory) provides further insights into relevant indicators.⁵⁴ For instance, in Section B.2, it was noted that even in sectors with high import penetration (and, therefore, a higher productivity of foreign firms on average), an incentive to increase protection can still exist depending on the distribution of productivity levels across domestic firms. Firm characteristics may also help to identify whether the implementation of non-tariff measures involving fixed cost increases for market entry could be related to the dominance of large, organized firms in the sector rather than a given public policy goal.

Finally, in Section B.2, the observation was made that a closer examination of the political context can provide insights into why certain non-tariff measures may be used to benefit producer interest groups despite their stated public policy objective. For example, certain NTMs are better suited to target political supporters or

more likely to persist beyond election periods and therefore lead to higher levels of political support. In sum, while the “indicators” mentioned in Section B are certainly neither exhaustive nor able to provide a conclusive answer to the question of the true policy rationale of an NTM affecting foreign trade interests, it still appears that this type of analysis could usefully be employed in order to narrow evidentiary gaps that may arise in the examination of certain trade rules.

(e) Challenges to expanding cooperation

While the challenges discussed above call for negotiations, international cooperation on non-tariff measures is proving to be difficult for a number of reasons. Here we discuss specific areas of concern.

(i) *International coherence*

As mentioned in Section E.2, both the TBT Agreement and the SPS Agreement give significant deference to governments following international standards. Additionally, GATS Article VI:5(b) says that pending the completion of disciplines on domestic regulation, in determining whether the requirements are compatible with the principles of necessity, transparency and objectivity, account shall be taken of international standards of relevant international organizations applied by WTO members. These provisions constitute a unique feature in the WTO: the recognition of other international organizations. However, international standards are not a panacea.

First, countries differ with respect to risk preferences (values) and tastes. To the extent that there is an absence of cross-border effects in such areas as local environmental protection, labour standards, or minimum product quality standards, harmonization to international standards may not be a realistic or economically optimal objective (World Trade Organization (WTO), 2005; World Trade Organization (WTO), 2011). If a country chooses to follow an international standard that does not completely achieve its policy objectives or reflect its national preferences, that country may endure costs due to inappropriate regulation, or be required to undertake further regulatory interventions at additional cost to meet its objectives.

Secondly, the international standardization process may not always function ideally, with the result that not all standards are set equally. Indeed, discussions in the regular work of the WTO have raised concerns with respect to how standards claimed (by the bodies that set them or certain members that use them) to be “relevant” or “international” are actually set. These concerns are about issues such as the opportunity to participate in and influence the standard-setting process and disagreement on the scientific or technical content of the requirements stipulated in the standard itself. Due to lack of regulatory capacity,

developing and least-developed countries may face particular challenges in influencing the standards development process.⁵⁵

In the area of SPS measures, since the international standard-setting bodies are explicitly recognized in the Agreement, there are no questions about whether they are relevant or international. SPS international standards are set through a multilateral process, with each of the three standard-setting bodies adopting a different approach to standard-setting (for more information on the different approaches, see G/SPS/GEN/1115). Nevertheless, similar concerns about participation and influence have been raised in relation to standard-setting in Codex, OIE and IPPC. For example, given the information and data requirements for scientific risk analysis, countries that have a stronger capacity to generate data may have a greater ability to influence outcomes in international standard-setting bodies (Jackson and Jansen, 2010).

Thus, there is a “line of tension” between, on the one hand, a legal obligation (albeit a qualified one) to use international standards, and, on the other, the fact that actually using a “relevant” international standard is not always straightforward. The regular work of the TBT and SPS committees and certain aspects of on-going negotiations in the Doha Round are affected by this tension.

There is another potential “tension” between, on the one hand, the SPS and TBT principles and mechanisms favouring international cooperation and regulatory convergence of standards (including through the presumption of compatibility offered to domestic measures that comply with “relevant” international standards) and, on the other hand, WTO members’ fundamental right, also recognized in the GATT, SPS and TBT agreements, to not use international standards – either because they are ineffective or inappropriate (for instance, because higher standards are desired) – and to adopt and implement their own domestic standards. It is likely that participation in the negotiation of international standards will be most effective when participants believe that the resulting standards will in fact be used by other participants. If members’ sovereignty may justify a right to set aside existing international standards, the legitimate non-application of international standards by some members may reduce the incentive for international cooperation and negotiation of such standards.

In services, while there is a strong incentive for a similar presumption in favour of international standards, there are significant additional obstacles. For a start, international standards are less prevalent in services as compared with goods. Observers some ten years ago were of the view that “it is unlikely that meaningful international standards for most services will be developed any time soon” (Mattoo and Sauv e, 2003). Has anything changed since then? One factor is that offshoring may have given greater incentive to private

industry to develop common standards. Another has been the growing understanding of the relationship between goods and services in global value chains. Since services are heavily embedded in goods, could the pervasiveness of international product standards create an incentive for services suppliers to support international standards? These are questions on which further research could shed light.

Apart from the challenge of developing international standards for services, there are also questions concerning the applicability of technical standards to services, and the extent to which a trade discipline could cover voluntary standards, which may be issued by non-governmental standardizing bodies without any delegated authority.

The WTO legal deference to international standards promotes a form of multilateral convergence. This convergence allows parties in the WTO to refer to standards set by other international organizations, even if the requirements they are based on are trade restrictive. This improves international coherence. However, the challenges outlined above remain, specifically in deciding whether any particular international organization sets “relevant” international standards.

(ii) *Private standards*

The topic of “private standards” arises across the WTO’s regular work in contexts as diverse as green protectionism, food safety and social responsibility. While some WTO members see no place for this discussion in the WTO, others are keen to engage. Obligations set out in WTO agreements are binding on governments, and only governments can make legal challenges through the WTO’s dispute settlement system. Considering that private standards are non-governmental by definition, this gives rise to at least two questions: what responsibility do governments have with respect to private standards, and what role does – or should – the WTO have in this regard?

Before looking at the law and role of the WTO, it is useful to recall why this has been a matter of discussion in the WTO. Although cast as “voluntary” in nature (because they are imposed by private entities), private standards may become *de facto* a necessary condition for market access even if not imposed by law. The magnitude of the trade effect will depend on the market power of the individual companies requiring adherence to the standard as well as the number that do so. Indeed, the effect of a particular private standard, if pervasive, could be greater than that of a government regulation of a smaller country.

Moreover, a “voluntary” standard that becomes widely used may be a precursor to government regulation. Different entities are involved. They may be companies, non-governmental standardizing bodies, certification

and/or labelling schemes,⁵⁶ as well as other non-governmental organizations. The requirements set out in the standards developed by these bodies address a range of perceived or actual consumer-driven concerns that are associated with products (or process and production methods used). These may be environmentally, socially or food safety motivated. The concerns that have been raised at the WTO – mainly by developing countries – are that the requirements are more stringent *de facto* than regulations imposed by governments, that they are proliferating, and that there is no recourse to discipline them.

The texts of both the SPS and TBT agreements contain disciplines that are relevant to non-governmental bodies.⁵⁷ In particular, both agreements have an obligation on governments to take “such reasonable measures as may be available to them” to ensure that non-governmental bodies/entities within their territories comply with the relevant provisions of the agreements.

The SPS Agreement states that WTO members should “formulate and implement positive measures and mechanisms in support of the observance of the provisions of [the SPS Agreement] by other than central government bodies” – and that they (members) shall take “such reasonable measures as may be available to them to ensure that non-governmental entities within their territories... comply with the relevant provisions of this Agreement”.⁵⁸ The TBT Agreement has similar language.⁵⁹ Yet, in the case of the TBT Agreement, there is a difference. It contains an annex (Annex 3) specifically addressed to standardizing bodies. This annex (the “Code of Good Practice”) is open to acceptance also by non-governmental bodies. This is significant. As mentioned elsewhere in this report, the text of the TBT Agreement – unlike the SPS Agreement – does not refer explicitly to any particular international standardizing body. It is therefore up to governments to decide, on a case-by-case basis, which standards may be a relevant basis for regulation in different situations, and this does not exclude standards set by non-governmental entities.

A key question, therefore, is the level of responsibility that governments have with respect to what non-governmental (standardizing) bodies do within their territories. It could be argued that the best-endeavour language attributes to governments a certain degree of responsibility. However, the extent is not obvious: for some WTO members, private standards are seen as beyond the grasp of WTO disciplines – and indeed, WTO members remain divided as to whether private standards legally fall within the scope of the TBT and/or SPS agreements.

Legal issues aside, and granted that concern about the impact of private standards is being voiced in relevant WTO committees, what should the role of the WTO be – if, indeed, it should have one? It is notable

that the kinds of issues that arise in discussions on private standards are not novel: they revolve around such matters as inadequate design, the basis of a measure, transparency, the need for common benchmarks (harmonization), and acceptance that doing things differently does not necessarily mean non-compliance (equivalence). Few, if any, of these issues are fundamentally different from those that arise in the context of SPS/TBT measures (technical regulations or conformity assessment procedures).

In the SPS area, delegations are currently working on enhancing information exchange and increasing understanding and awareness of how private standards compare with or relate to standards set by recognized international standard-setting bodies (such as those of the Codex) and governmental regulations. The situation in the area of TBT is somewhat different. The TBT Agreement does not refer explicitly to any recognized international standardizing bodies. In fact, governments frequently base regulation on standards that are developed by non-governmental bodies, some with international reach.⁶⁰ WTO members have developed a refined toolkit of rules and procedures that are helping regulators and trade officials increase the transparency of SPS/TBT measures and to ensure that they do not unnecessarily affect trade. These same rules, together with the experience gained, may also provide useful guidance for the development of private standards.

(iii) Disciplines on domestic regulations in services

How best to strengthen trade disciplines in services without unduly curtailing national regulatory freedoms has been a central question unresolved by the multilateral community. The GATS framework has focused primarily on the negotiation of market-opening commitments, leaving other aspects of domestic regulation and practice largely untouched. Yet, since the establishment of the WTO in 1995, WTO members have grappled with the question of what additional disciplines are required on licensing, qualification and technical standards to ensure that they are not more burdensome than necessary to achieve legitimate policy objectives. The pervasiveness of regulations in services has made it vital to ensure that market access and national treatment commitments are not impaired by unduly burdensome or protectionist practices.

Despite its obvious complement to market access, why has it been so difficult for the multilateral trade community to conclude this set of disciplines? One reason has been the debate over whether such disciplines should be "sectoral", affecting only one specified sector, or "horizontal", in the sense of applying to all services sectors. Progress made in 1998 on the conclusion of the Accountancy Disciplines have led some WTO members to conclude that "sectoral" negotiations could potentially be a more

practical route to pursue as the disciplines could be shaped in accordance with the specificities of that sector. Others have argued that a "horizontal" approach would be more efficient as the rationale for regulation and the reasons for transparency, objectivity and impartiality in the regulatory process are similar across services sectors.

A deeper consideration of this issue would tend to suggest that discussions on the form and scope of the disciplines hides a more fundamental tension, namely the principal concern that common rules at the multilateral level will result in a loss of regulatory freedom to pursue non-trade objectives for services. This begs the question why if governments have been able to agree to TBT and SPS disciplines to ensure that technical regulations, standards and procedures on goods do not create unnecessary obstacles to international trade, has it proven so much more difficult in services?

One reason, though not the only one, may have been the difficulty in designing a "necessity test" that would accommodate the depth and range of regulatory precaution that WTO members appear to wish to retain for services. The Accountancy Disciplines, not yet in force, contain a "necessity test", similar to that in the TBT and SPS agreements, which requires members to ensure that "measures are not more trade restrictive than necessary to achieve a legitimate objective", with an illustrative list of objectives provided. Such a test was designed to leave the choice of objectives to members, with the focus of the discipline on the necessity of the measure used to achieve its avowed purpose. However, it should be kept in mind that unlike in the case of TBT and SPS measures, there is no "product" in services which can be sampled, tested and inspected based on scientific methods. Thus, reaching agreement on what would be the appropriate criteria for determining and evaluating necessity could be inherently more difficult.

Could such a "necessity test", or a variation of it, such as one on "disguised trade restrictions", be used in "horizontal" domestic regulation disciplines? The negotiations, so far, have found no common view on this issue. Yet, a recurring principle in trade agreements is the requirement that the measure used to achieve a certain legitimate objective should be the "least trade restrictive reasonably available". If such a test were to exist, governments would need to assess, when adopting regulations, whether they could use an alternative measure that would be equally able to achieve the policy objective chosen, but which would be less trade restrictive.

Uncertainty remains among certain regulators as to whether their autonomy to regulate would be excessively restricted by a necessity test. On the other hand, proponents of the principle of necessity have argued that a test could be designed that does not

question the necessity of the policy objectives chosen, but solely the necessity of the measure used. Many questions have arisen in the discussions. These relate, for example, to the factors to be considered in determining what is “necessary” and what is not and whether the implementation of a necessity test should also require consideration of whether the policy objective is legitimate or not.

The challenge of disciplining any undesired trade effects of regulation cannot, of course, be reduced only to the question of the “necessity” test. Despite over a decade of negotiations, much remains to be done to improve cooperation and awareness among regulators, policy-makers and trade negotiators of the links between regulatory issues and trade principles. There are also problems of capacity which have made it difficult for negotiators to engage on issues that are not within the traditional realm of trade policy. Regulatory capacity building, in terms of the ability of authorities to formulate and enforce rules appropriate to services trade opening may not be a new challenge, but it is certainly one which has yet to be addressed in a systematic and meaningful way by the multilateral trade community.

Beyond negotiating new disciplines, there remains the challenge of advancing harmonization and recognition. There is an obvious link between multilateral rules on domestic regulation and efforts to harmonize and recognize standards, qualifications, requirements and procedures. The need for disciplines to curb unnecessarily burdensome domestic regulation would clearly be diminished if jurisdictions were to move towards common regulatory practices or develop more arrangements for recognition. These considerations raise the question whether international standards could be used to a greater extent in services. Common international standards would need to be set at a level and in a manner that does not favour those with the greatest capacity to influence the process and outcomes. For the most part, this work would have to be undertaken outside the WTO, which is not a forum for setting standards.

(iv) Pro-competitive principles for services regulation

A unique feature of the GATS is its promotion of competition within as well as across borders. In a way, disciplines under Article VI:4 – by curbing unnecessarily burdensome regulatory practices in licensing and qualification regimes – facilitate market access and thereby potentially enhance competition. Indeed, given that domestic regulation would apply to foreign and domestic suppliers alike, any applicable GATS disciplines that result from these negotiations would in effect improve market contestability.

Going beyond the negotiation of domestic regulation disciplines under Article VI:4, which only addresses a

very particular set of regulatory issues, there is the question of how much further can and should a trade agreement go in requiring adherence to certain pro-competitive principles. This question has been most prominently answered in the telecommunications sector, where a “Reference Paper” which included pro-competitive principles was negotiated and then committed to by a significant number of WTO members in their schedules of commitments.

The Reference Paper specified pro-competitive regulatory principles for the telecoms sector and was a major achievement of the 1997 Agreement on Basic Telecommunications. It has helped shape the regulatory environment in this sector over the past decade by elaborating a set of principles covering matters such as competition safeguards, interconnection guarantees, transparent licensing processes, and the independence of regulators in a commonly negotiated text. Every government that has acceded to the WTO since the basic telecommunications negotiations has also taken on these disciplines. Furthermore, the fact that the Reference Paper obligations are binding helps propel the domestic reform agenda needed to fully implement the opening of this sector to competition.

The experience of the Reference Paper provides some interesting lessons on what might be some of the fundamental ingredients required to facilitate agreement on the adherence to certain pro-competitive principles. First, there was a shared policy vision for the sector concerned and of the role that market-oriented regulation could play in improving efficiency, as well as achieving social equity objectives. For example, regulators agreed on the need for governments to control the dominant incumbent supplier so as to prevent it from engaging in anti-competitive behaviour.

Secondly, the instrument established a set of common understandings which were sufficiently broad as to allow for diverse rules and practices, but at the same time sufficiently specific to hold governments accountable to transparent, objective and impartial pro-competitive regulation. Thirdly, sector regulators were directly involved in negotiating such an instrument. This was important since in-depth understanding was required of how the market functioned, what market failures needed to be corrected, and how such problems might be appropriately addressed. Fourthly, the instrument allowed for self-selection, as it only entered into force through incorporation in a WTO member’s schedule of specific commitments. Eighty-two members (counting EU member states individually) have, so far, attached the Reference Paper to their schedules of commitments.

The success of the Reference Paper raises the question whether such an instrument could be used in other sectors? Most obvious would be those which

share a similar market structure as telecommunications services, with a major supplier – usually a former monopoly – that controls the infrastructure or network necessary for the supply of services. In such a situation, the major supplier can block new market entrants by restricting access to the infrastructure or network, by limiting participation in the relevant market through its control of essential facilities or by the use of a dominant position in the market. Collective action to agree on a set of pro-competitive regulatory principles would thus be necessary to ensure that there is a level playing field. Another feature of the market might be that scarce resources are needed for the delivery of services, and the manner by which these are allocated would determine whether participation is possible or not. Sectors such as energy, certain forms of transportation, waste and water management, and postal and courier services, to greater or lesser degrees, tend to share some of these characteristics.

For such sectors, an instrument which uses similar regulatory principles as those found in the Reference Paper could help specify the safeguards needed to prevent a major supplier from engaging in anti-competitive practices. Such principles would need to be implemented by a regulatory body which would be separate from, and not accountable to, any services supplier in the market. While such instruments could in theory be negotiated outside the context of a trade agreement, in practice there are political economic reasons why collective action as part of a trade deal is often required (see Section E.1(c)).

An interesting feature of the Reference Paper was the fact that it was negotiated by a group of Members not as an annex to the GATS but as a set of principles that would only be legally binding for those Members who subscribe to it. This rather unique feature of the Reference Paper allowed a critical mass of Members to develop a set of disciplines without having to have consensus. The document itself did not have any particular legal status as it would only enter into force for those Members who attach it to their schedules. This is possible because members can undertake additional commitments under Article XVIII of the GATS in their schedules of specific commitments. It would be interesting to consider whether such an approach could be used for the Article VI:4 domestic regulation disciplines.

Under Article XVIII, WTO members may negotiate commitments with respect to measures affecting trade in services which are not market access and national treatment limitations, including those regarding qualifications, standards or licensing matters. Thus, domestic regulation disciplines could be undertaken as an additional commitment.

(f) Investing in institutions

(i) *Supporting regulatory capacity building for trade in goods*

Even prior to the establishment of the WTO, countries recognized that capacity constraints relating to the standards of bodies, technical infrastructure and the development of regulations in general were of concern for developing countries, and particularly least-developed countries (LDCs). Both the WTO SPS and TBT committees include “technical assistance” as an agenda item at every committee meeting. The discussions in the SPS and TBT committees have focused on facilitating the implementation of the agreements’ provisions on technical assistance.

The TBT Agreement obliges WTO members to give advice to other members (on TBT matters), especially developing country members, and to provide other members with technical assistance (on TBT matters). The text of the Agreement illustrates how the establishment of national standardizing or conformity assessment bodies or institutions and a legal framework would enable developing country members to fulfil the obligations of membership or participation in international or regional systems for conformity assessment. The Agreement also provides advice on steps that should be taken by developing countries’ producers if they wish to have access to systems for conformity assessment operated by governmental or non-governmental bodies. There is also a more general obligation to give priority to the needs of LDCs.

The SPS Agreement contains similar provisions related to technical assistance. According to the Agreement, WTO members agree to facilitate the provision of technical assistance to developing country members, either bilaterally or through the appropriate international organizations. Assistance may be advice, credits, donations or grants and should allow countries to adjust to and comply with SPS measures in their export markets. In addition, when substantial investments are needed for developing countries to fulfil SPS requirements in export markets, members agree to consider providing technical assistance that would permit developing country members to maintain and expand market access opportunities.

Technical assistance in the TBT area

The TBT Committee oversees the implementation of the Agreement’s provisions on technical assistance (contained in Article 11), and its role is essentially one of information exchange. One insight that emerges from the work of the TBT Committee is the need for the creation of lasting infrastructures, both regulatory and physical in nature, which may set in place the right conditions for the efficient and effective development and design of technical regulations, standards and

conformity assessment procedures. In particular, the lack of technical infrastructure (or inadequacy of existing infrastructure) constrains many developing country members from accessing markets. Meeting the standard may sometimes not be enough – it is also necessary to be able to demonstrate compliance to create confidence in the quality and safety of exported products.

Quality infrastructure, including laboratories and accredited certification bodies, is essential for developing countries' competitiveness. The TBT Committee has encouraged WTO members to provide technical cooperation in the area of conformity assessment specifically aimed at improving technical infrastructure (e.g. metrology, testing, certification, and accreditation).

Technical assistance in the SPS area

In overseeing the technical assistance provisions of the SPS Agreement (contained in Article 9), the SPS Committee facilitates the exchange of information where WTO members identify specific technical assistance needs which they may have, and/or report on any SPS-related capacity building activities in which they are involved. Among the most pressing needs highlighted through the work of the SPS Committee, apart from information requirements, was the development of laws and regulatory frameworks and institution building.

The need for hard infrastructure including laboratories, although important, did not generally represent the most serious obstacle to an appropriate implementation of the SPS Agreement. In this regard, the SPS Committee continues to encourage its members to provide targeted technical assistance which responds to the identified needs of members. Discussions within the SPS Committee have also highlighted the technical and scientific expertise and funding available in other international organizations, while emphasizing the need to improve inter-agency coordination (see, for example, G/SPS/GEN/875).

Standards and Trade Development Facility

If trade is to serve as an engine of growth and an instrument to tackle poverty reduction, developing countries must have effective systems in place to control their SPS risks and meet international standards. Controlling SPS risks will have market access benefits, as well as direct benefits to domestic producers and consumers by reducing pest and disease prevalence, raising production and improving food security. Improved compliance with international SPS standards may also contribute to improved biodiversity and environmental protection. However, given capacity constraints developing countries may not have adequate SPS systems in place. To address these impediments, notably in the public sector,

sustained long-term commitment to funding within national government budgets and by donors will be required to ensure minimum levels of capacity with ultimate positive effects on market access and human and environmental health.

In 2002, recognizing the significant benefits that can arise from investments in SPS capacity, five international organizations – the Food and Agriculture Organization of the United Nations (FAO), the World Organisation for Animal Health (OIE), the World Bank, the World Health Organization (WHO) and the WTO – jointly established the Standards and Trade Development Facility (STDF).⁶¹ The STDF is a global partnership that supports developing countries in building their capacity to implement international SPS standards, guidelines and recommendations as a means to improve their human, animal and plant health status, and ability to gain and maintain access to markets. Its mandate is to: (i) increase awareness about the importance of SPS capacity building, mobilize resources, strengthen collaboration, and identify and disseminate good practice; and (ii) provide support and funding for the development and implementation of projects that promote compliance with international SPS requirements.

The STDF plays an important role in facilitating discussion of past, on-going and planned SPS-related technical cooperation programmes and initiatives. It identifies cross-cutting topics of thematic interest to partners, donors and beneficiaries and organizes joint consultations at global and regional level to further address these issues. Examples of successful STDF work in the past relate to good practice in SPS-related technical cooperation, the use of economic analysis to inform SPS decision-making, SPS risks and climate change, indicators to measure the performance of national SPS systems, regional and national SPS coordination mechanisms, and public-private partnerships in support of SPS capacity. Enhancing the awareness in developing countries, notably at political and decision-making levels, about the importance of SPS compliance and the need for additional investments in this area is another central theme in the STDF's work.

Given the success of the STDF in the area of SPS capacity building, some suggestions have been made that the STDF model could also be adopted to address standards implementation in the area of TBT. In order for this approach to work, there would need to be clarity, among other issues, regarding which specific international standards would be relevant. Furthermore, this type of initiative would require a significant amount of resources in order to be initiated and sustained. Still, lessons learned from the STDF experience indicate that capacity building efforts of this nature can efficiently provide practical economic and health benefits to countries.

Capacity building and international standards

Due to lack of regulatory capacity in the areas of TBT and SPS, developing and least-developed countries may face particular challenges in respect of participating in international standard-setting activities. Enhancing developing country participation in international standard-setting processes is a crucial step in improving developing countries' ability to use and adapt international standards. Today, actual participation in standard-setting activities by developing countries remains a challenge. Only a small proportion of developing countries are responsible for the management of working groups and technical committees, where the detailed work takes place. Standardizing bodies and international standard-setting organizations should increase their efforts in building understanding of the standard-setting process and in strengthening institutional capacity in developing countries, and particularly LDCs.

(ii) Supporting regulatory capacity building for trade in services

Given the importance of regulation to the proper functioning of services markets, weakness in regulatory capacity could actually have a negative impact on trade opening. Without the reassurance of a regulatory apparatus capable of identifying and remedying market failures, there might be strong reluctance to undertake domestic reforms and to open markets to international trade. If there is no regulatory capacity to curb anti-competitive conduct or to implement effective prudential regulation, there is a downside risk to market opening, as profits might only be transferred from domestic agents to foreign ones with no discernible efficiency gains. Greater regulatory capacity could also help build greater support for market opening by giving reassurance that the pursuit of social equity objectives would be part of the regulatory framework. Enhancing capacity would also facilitate regulatory cooperation, be it through the negotiation of domestic regulatory disciplines, the development of international standards, or initiatives on harmonization and recognition.

Finding ways to support regulatory capacity building and cooperation so as to complement services policy reform and development is thus an important challenge for the future. The OECD and APEC have established various processes for bringing trade officials together with regulators. The World Bank has launched an initiative on Services Knowledge Platforms, with the aim of establishing a forum for sharing knowledge of regulatory experiences and impacts. This would include information on the factors underlying successful efforts to expand trade in services and the complementary policies that can be used to address market failures and distributional concerns. Such a broad forum, although focused on international regulatory cooperation in services, could do much to foster trade and development.

In sum, addressing regulatory challenges in trade in services requires doing more than curbing non-transparent or unduly restrictive regulatory practices. The challenge which services regulation poses for trade opening should not be seen simply in terms of having less regulation, but more in terms of achieving better regulation – that is, regulation which more effectively achieves public policy objectives with the least distortion of trade. Work on how countries could obtain such results remains at a nascent stage.

Two priority reforms could be assisted by the development community under the “Aid for Trade” initiative. The first would be to support regulatory capacity building so as to strengthen the ability of regulatory institutions to identify, design and implement policies that address market failures and undertake regulatory impact assessments. The second would be to encourage international cooperation to address the regulatory effects on third parties and to share knowledge on good practices. Such work need not be linked to trade negotiations, yet it could do much to improve the climate for opening up trade in services. The WTO has no particular comparative advantage in regulatory matters but it could act as a focal point, as it does for many other supply-side initiatives, to build capacity for trade.

5. Conclusions

This section has three substantive parts addressing the theory, the practice and the challenges of cooperation on non-tariff measures. Section E.1 offers a theoretical framework for understanding the rationale for cooperation on NTMs in trade agreements. It shows that this rationale relates to policy substitution as well as governing international production, improving transparency, limiting the competition effects of NTMs and ensuring the efficient use of private standards. Addressing the first problem primarily motivates shallow integration but the other concerns often require deep forms of integration.

Section E.2 and Section E.3 analyse the way that the multilateral trading system deals with non-tariff measures. Insights from practice in the SPS, TBT and services areas highlight how actual cooperation at the WTO seeks to address the problems identified in Section E.1. In particular, the search for efficient policy is bolstered by regulatory dialogue at the multilateral level (for instance, through committee work in goods and negotiations in services) and on a regional basis, the development and adoption of good regulatory practices, and through the development and use of international standards. Section E.3 focuses on how cases involving the use of NTMs have been dealt with by the WTO legal framework and its dispute settlement system. Specifically, it describes the key ways that WTO disciplines address the challenge of distinguishing between legitimate NTMs and measures

designed for protectionist purposes and how these provisions have been interpreted in actual disputes.

Section E.4 provides a speculative (and not necessarily all-encompassing) view of what lies ahead for the WTO in dealing with non-tariff measures. While the multilateral trading system has developed several means to promote deep integration, challenges and opportunities remain. These include: (i) challenges in finding the right mix between international commitments and domestic flexibility in setting NTMs and in improving transparency, particularly in the face of economic, social and environmental change;

(ii) opportunities to improve the dispute settlement mechanism of the WTO through better integration of economic and legal analysis in the determination of legitimate NTMs; (iii) improvements in the current rule-making to adapt the trade system to a fast evolving world in areas such as private standards and domestic regulation in services; (iv) better global cooperation on NTMs which can hardly be achieved without major steps to bolster regulatory capacity in developing countries through concrete actions.

Endnotes

- 1 Nevertheless, a basic feature of the commitment approach to trade agreements is worth emphasizing here: unlike the terms-of-trade theory, which offers a robust reason to expect that trade agreements ought to be trade liberalizing, there is no presumption one way or the other under the commitment theory as to whether trade agreements should increase or reduce trade.
- 2 International agreements often include provisions that can be applied to future cases without reference to specific cases. Because these provisions are general, they would require interpretation to apply to new individual cases. This *ex ante* indeterminacy is known in the economics literature as an “incomplete contract”.
- 3 The International Trade Centre has developed a “Standards Map”, which contains information on 74 private standards schemes operational in over 160 countries and covering over 40 economic sectors and product groups. It mainly covers agricultural (organic), textile and flower products, which are of significant interest to developing countries. Examples include: information on current and potential geographic distribution of private standards such as Fairtrade, the Forest Stewardship Council and the Carbon Trust Foot Printing Label. This web-based portal allows the user to select standards based on criteria such as coverage, economic and/or quality requirements, type of certification process. Although this is not an exhaustive database, it provides useful information. It is available at: www.standardsmap.org.
- 4 Several other voluntary standards schemes have emerged in both developed and developing countries since 1992. While some of these schemes are private initiatives, others are managed by governments. Examples of government schemes include the Sustainable Forest Management Standard in Canada, CERFLOR in Brazil, LEI in Indonesia, the Malaysian Timber Certification Council, and the Sustainable Forestry Initiative and the American Tree Farm System in the United States.
- 5 More information is available at: www.fsc.org.
- 6 Auld et al. (2008); FSC and PEFC online information.
- 7 ISO is working on a project (ISO 14067) that seeks to develop an international standard on quantification and communication of greenhouse gas emissions of goods and services. In addition, the World Resource Institute and the World Business Council for Sustainable Development are working on two new standards for products and supply chain greenhouse gas accounting and reporting.
- 8 Loi. No. 2010-788: The National Commitment for the Environment.
- 9 The discussion of quality standards and labels builds on the discussion in the *World Trade Report 2005* (World Trade Organization (WTO), 2005b), which provides detailed and thorough analysis of global cooperation on standards and regulation.
- 10 In addition to the articles listed here, Article XVII of the GATS is where members commit through negotiations, along modal lines in their schedules, to extend national treatment to foreign services and services suppliers. In this case, national treatment is treated like negotiated market access rather than a general principle of conduct as it is in Article III of the GATT or the other listed articles.
- 11 The use of the term “discrimination” sometimes differs across disciplines. For economists, any policy that differentially treats products is discriminatory, independently of the legitimacy of the measure. For lawyers, on the other hand, the term discrimination often carries a normative implication and is limited to those situations where a policy differentially treats products in a way that is inconsistent with WTO rules. In this discussion, the word discrimination is used in its economic meaning.
- 12 A separate legal issue is whether these types of concerns can be addressed within the context of exceptions, such as the ones contained in GATT Article XX.
- 13 APEC has done work specifically on the implementation of the TBT Agreement and GRP. The APEC Committee on Trade and Investment’s Subcommittee on Standards and Conformance has developed a document that lays out the principles and practices of GRP as they relate to improving the implementation of substantive obligations under the WTO Agreement on Technical Barriers to Trade. This study, “Supporting the TBT Agreement with Good Regulatory Practice: Implementation Options for APEC Members”, builds upon the recognition of the WTO TBT Committee that use of GRPs can make an important contribution to the effective implementation of the TBT Agreement, and to reducing unnecessary technical barriers to trade (G/TBT/W/350, 16 March 2012). The WTO Secretariat has issued a “Compilation of Sources on Good Regulatory Practice (GRP)”, G/TBT/W/341, 13 September 2011.
- 14 G/TBT/26
- 15 TBT Regulatory Cooperation Workshop, 8-9 November 2011. See: http://www.wto.org/english/tratop_e/tbt_e/tbt_events_e.htm

- 16 RAPEX (Rapid Alert System for Non-Food Products), the EU-wide alert system for all dangerous consumer products, pharmaceutical products and medical devices, allows rapid exchange of information between EU member states about measures undertaken to prevent the marketing or use of products which pose a serious risk to consumer health and safety.
- 17 G/TBT/W/340
- 18 G/TBT/W/340
- 19 Report of chairperson to TBT Committee on TBT Regulatory Cooperation Workshop: http://www.wto.org/english/tratop_e/tbt_e/docs_wkshop_nov11_e/chair_report_e.pdf
- 20 See APEC Electrical and Electronic Equipment Mutual Recognition Arrangement (EEMRA), at www.apec.org/
- 21 Blind (2004); German Institute for Standardization (DIN) (2000); UK Department of Trade and Industry (DTI) (2005).
- 22 Article 2.5 of the TBT Agreement, Article 3.2 of the SPS Agreement.
- 23 The SPS Agreement names the following as international standard-setting organizations: FAO/WHO Codex Alimentarius Commission (Codex), the FAO International Plant Protection Convention (IPPC), and the World Organization for Animal Health (OIE). The TBT Agreement defines both a "standard" (Annex 1, para. 2) and an "international body or system" (Annex 1, para. 4) but does not name a particular international standardizing body.
- 24 In the area of conformity assessment, the importance of "Quality infrastructure" is often referred to and linked to competitiveness. This includes, for instance, adequate laboratories and accredited certification bodies. The TBT Committee has encouraged members to provide technical cooperation in the area of conformity assessment specifically aimed at improving technical infrastructure, e.g. metrology, testing, certification, and accreditation. (This is also discussed in Section E.4.f.)
- 25 FAO/WHO Codex Alimentarius Commission (Codex), the FAO International Plant Protection Convention (IPPC), and the World Organization for Animal Health (OIE).
- 26 Accreditation is defined as "the independent evaluation of conformity assessment bodies against recognized standards to ensure their impartiality and competence to carry out specific activities, such as tests, calibrations, inspections and certifications" (G/TBT/GEN/117, more information can be obtained at www.ilac.org and www.iaf.nu).
- 27 G/TBT/W/349, dated 13 March 2012.
- 28 Reference to members' submissions to G/TBT/26.
- 29 Zoonoses are defined as any diseases or infections that are naturally transmissible from vertebrate animals to humans (World Health Organization (WHO), 2012).
- 30 Decisions and Recommendations Adopted by the WTO Committee on Technical Barriers to Trade Since 1995, G/TBT/1/R.10 (9 June 2011); Recommended Procedures for Implementing the Transparency Procedures of the SPS Agreement, G/SPS/7/Rev.3 (20 June 2008).
- 31 SPS Information Management System, <http://spsim.wto.org/>; TBT Information Management System, <http://tbtims.wto.org/>.
- 32 MFN-inconsistent measures also fall into this category, and are the ones more severely sanctioned by the GATS. In fact, barring any exemptions, the MFN obligation applies unconditionally to all the services covered by the Agreement.
- 33 See Delimatsis (2008) and Krajewski (2008) for a discussion on creating a necessity test of the type contained in the TBT and SPS agreements.
- 34 GATS Article VII allows for recognition measures as long as there are adequate provisions for other members to negotiate accession and/or achieve recognition of their requirements and certificates, and the measures do not constitute a means of discrimination or a disguised restriction on trade.
- 35 The panel report in *EC- Approval and Marketing of Biotech Products* is also cited as an example of a situation in which differential treatment of the imported and domestic products was considered insufficient for a violation of the non-discrimination obligation in Article III. In that case, the panel said that it was not evident that the less favourable treatment was explained by the foreign origin rather than by perceived differences in terms of the safety of the products (see Panel Report, *EC – Approval and Marketing of Biotech Products*, paras. 7.2509 and 7.2516; Marceau and Trachtman (2009)).
- 36 In *EC – Asbestos*, the Appellate Body found that regulatory concerns and considerations may play a role in applying certain of the "likeness" criteria (that is, physical characteristics and consumer preferences) and, thus, in the determination of likeness under Article III:4 of the GATT 1994.
- 37 Article 1.3 of the TBT Agreement states: "All products, including industrial and agricultural products, shall be subject to the provisions of this Agreement". On the other hand, the SPS Agreement has a much narrower scope, which may mean that naming bodies is more appropriate in that context.
- 38 These principles are: (1) transparency; (2) openness; (3) impartiality and consensus; (4) effectiveness and relevance; (5) coherence; and (6) development. These are contained in full in G/TBT/1/Rev.10 (Annex B), 9 June 2011, p. 46.
- 39 The SPS Committee had established the ad hoc working group in October 2008. Members of the ad hoc working group on SPS-related private standards were: Argentina, Australia, Belize, Brazil, Canada, Chile, China, Colombia, Costa Rica, Dominican Republic, European Union, Ecuador, Egypt, Guatemala, Japan, Mexico, Mozambique, New Zealand, Nicaragua, Norway, Pakistan, Paraguay, Peru, St. Vincent and the Grenadines, South Africa, Chinese Taipei, Thailand, United States, Uruguay and the Bolivarian Republic of Venezuela.
- 40 Other activities that take place in the committees between the circulation of the notifications and the filing of an STC may contribute to transparency.
- 41 The example of the notification requirements of Article 25 of the Agreement on Subsidies and Countervailing Duties, which invites members to notify measures of other members having the effect of a subsidy that have not been notified, is illustrative. Despite the obligation for members which consider that there are no measures requiring notification in their territories to so inform the Secretariat in writing, only 78 countries had made a notification in 2009.
- 42 See for example Article 25.10 of the Agreement on Subsidies and Countervailing Measures. Note that members also have the possibility to ask questions about other members' notifications – for instance, if they consider that they are incomplete.
- 43 Six years or more for all countries but the 20 largest traders.
- 44 See WTO document WT/L/848.

- 45 Part of the answer to these questions obviously depends on how much resources can be allocated to the monitoring exercise.
- 46 The committee on trade in services also offers members the possibility to share information on national experiences and regimes.
- 47 The new portal will for example allow users to access all notified information on trade, tariffs and NTMs that relates to a given tariff line in one single query. All this information was previously stored in separate silos which had to be accessed separately if they were accessible online at all.
- 48 The decision of the Market Access Committee on a "Framework to enhance IDB Notifications Compliance" [G/MA/239 of 4 September 2009] made it easier for the Secretariat to assist members in providing their trade and tariff notifications by allowing the use of other relevant official sources.
- 49 Critics of "deep integration" question the capacity of international organizations to make these determinations. For example, Rodrik (2011) argues that the determination of legitimate or illegitimate trade measures should arise from informed deliberations at the national level, including both importers and exporters in order to balance competing interests in a transparent manner.
- 50 It should be kept in mind that the most efficient measure may well be a discriminatory measure if the source of the externality lies abroad. It also depends on whether a government takes into account only domestic welfare or foreign interests as well. The latter would be particularly important where e.g. transboundary externalities are concerned. As mentioned in Section E.1, if several countries have common interests, cooperation can ensure that global welfare is maximized.
- 51 For example, Swinnen and Vandemoortele (2009) and Marette and Beghin (2010) hold that many public standards, e.g. relating to the regulation of GMOs, are introduced following demands by consumers, even though their trade-restricting effects also benefit some local producers. However, even such an assessment may not be an easy task. Falvey and Berti (2009) provide a concise theoretical framework that illustrates the difficulties involved in disentangling producer from consumer interests when identifying the appropriate level of a minimum quality regulation that would address information asymmetries suffered by consumers. Carpenter (2004) develops a model in which new product requirements seem to confer a commercial advantage to established firms even if the regulator was motivated only by reputation concerns and an interest to be responsive to consumers.
- 52 See particularly also Box B.4.
- 53 Although it is often believed that protection should increase with the ratio of import penetration, the latter result broadly reflects the idea of "sensitive" sectors. A number of papers, such as Goldberg and Maggi (1999) and Gawande and Bandyopadhyay (2000), have found ways to measure these variables and empirically confirm the findings. The latter authors also emphasize that these three factors (import penetration, import elasticity and whether industries are politically organized) go a long way in explaining the pattern of protection and reduce the need to analyse a larger set of factors, including skill composition of employees, average earnings, labour shares and geographical concentration, that have been employed in the empirical literature, without being derived from tightly-knit theories.
- 54 Fischer and Serra (2000) highlight the importance of analysing the characteristics of foreign firms and markets as well in order to understand the incentives of domestic firms to lobby for protectionist measures and get an indication of which industries face higher pressure for protection than others. One important consideration is, for example, the availability and size of alternative markets for foreign competitors and the fixed cost associated with producing under multiple product regulations. In an extension to this approach, Marette and Beghin (2010) further emphasize the importance of taking into account firm heterogeneity and international market conditions. They show that a more stringent product requirement compared to an international standard may not always result in protectionism, but can even be "anti-protectionist" if foreign producers are more efficient at addressing the related externality than domestic producers.
- 55 In 2000, the TBT Committee agreed on six principles and procedures that should be observed during the development of international standards, guides and recommendations for the preparation of technical regulations, conformity assessment procedures and standards. This Committee Decision has recently become the subject of discussion both in the Committee and in the NAMA context (G/TBT/1/Rev.10 (Annex B), 9 June 2011, p. 46).
- 56 For example: FSC, MSC, Carbon footprint labelling, sectoral trade associations (Florverde for flowers; BCI for cotton, or in the food sector: the Global Food Safety Initiative (GFSI)). See examples discussed in Box E.2.
- 57 The TBT Agreement defines a non-governmental body as follows: "Body other than a central government body or a local government body, including a nongovernmental body which has legal power to enforce a technical regulation" (TBT Agreement, Annex 1, para 8). The SPS Agreement uses the term "non-governmental entity" but it is not defined in the Agreement.
- 58 SPS Agreement Article 13 (on implementation).
- 59 TBT Agreement, in particular Article 4.1; articles 3.1, 8.1 and 9.2 are also relevant.
- 60 For instance, members frequently referred to the ISO and the IEC in the TBT context; both these bodies are non-governmental in nature.
- 61 More information on STDF can be found at: <http://www.standardsfacility.org/en/index.htm>.

F. Conclusions

This report has sought to deepen understanding of the role, incidence and effects of non-tariff measures and services measures in the multilateral trading system of the 21st century. Against a background of profound changes in the nature of trade flows and trade patterns, institutions, social and environmental realities, and consumer preferences, the Report has identified the challenges that NTMs and services measures raise for international cooperation and, more specifically, for the World Trade Organization.

The range of non-tariff measures and services measures is vast and well beyond the scope of a single report. In addition to a general analysis of NTMs and services measures, the report has focused therefore on technical barriers to trade (TBT), sanitary and phytosanitary (SPS) measures and domestic regulation in services.

TBT/SPS measures are of interest to producers, traders and consumers alike. They raise specific transparency challenges. A core question is how to address any adverse trade effects of non-tariff measures without impeding the legitimate pursuit by governments of public policy objectives, such as protecting public health. A related question concerns the role of the WTO and other international trade bodies in promoting regulatory convergence as a means of reducing unnecessary trade barriers. These challenges are very similar to those faced by WTO members when they discuss what additional disciplines are required on domestic regulation in services to ensure that it is not more burdensome than necessary to achieve legitimate policy objectives.

Economic analysis provides some insights into why governments use non-tariff measures and services measures. Both types of measure can serve legitimate public policy goals but they may also be used for protectionist purposes. Identifying a government's intent is inherently difficult, particularly in the case of TBT/SPS measures and domestic regulation in services. Welfare economics and political economy analysis help to explain the use of particular measures. The analysis also shows how recent changes in the trading environment, such as the expansion of global production sharing, climate change and the growing importance of consumer concerns in richer countries, affect the use of NTMs. Circumstances can arise in this more complex environment where producer and consumer interests may diverge over the nature of a measure identified to defend a public policy goal.

Assessing the incidence of non-tariff measures and services measures is difficult because of large information gaps. Data are sparse because of the very nature of these measures, which are diverse and often not easy to quantify. Moreover, the fact that governments lack the incentive to provide such information plagues the collection of official data. As far as services are concerned, while commitments in market access and national treatment are known, very little information is available on the regimes that are actually applied. Data limitations are particularly acute in the case of domestic regulation, where the absence of criteria that help to single out the regulatory measures with a significant effect on trade is a complicating factor.

On the goods side, information from official sources does not allow the identification of trends over time in the relative frequency of various non-tariff measures

globally or by region. What it shows is the prevalence of TBT/SPS measures in the overall incidence of NTMs. As revealed by recent business surveys, these measures also represent the main source of concerns for exporters in most developed and developing countries. Another insight from business surveys is that exporters generally have more problems with the way in which measures are applied than with the measures themselves.

The incidence of non-tariff measures and services measures is only half of the picture, the other half being their trade restrictiveness. The evidence reviewed in the Report has confirmed that NTMs significantly distort trade, possibly even more than tariffs. This result, however, should be interpreted with caution because it fails to capture the recent changes in trade brought about by the development of global supply chains. More precisely, a general finding is that TBT/SPS measures restrict trade in agricultural products, while the existence of standards often has a positive effect on trade in manufacturing products, especially in high-technology sectors. Moreover, there is a reasonable expectation that harmonization and mutual recognition of standards will increase trade.

In order to identify the challenges that non-tariff measures and services measures pose for the WTO, the Report has spelled out the reasons behind international cooperation on such measures. The traditional theory suggests that policy substitution is a key problem that rules on NTMs in a trade agreement need to address. Shallow integration in the form of simple rules on transparency, national treatment and non-violation (whereby a member may claim that it has been deprived of an expected benefit because of another member's action even if a WTO agreement has not been violated) addresses this problem.

The changing nature of international trade, however, creates new policy considerations that may motivate the need for deeper forms of institutional integration. Also, growing concerns about TBT/SPS measures have brought the issue of regulatory convergence to the WTO, raising a number of difficult challenges. The Report has set out to examine GATT/WTO disciplines as interpreted in dispute settlement, showing that GATT rules on NTMs are generally consistent with a shallow integration approach but that the TBT and SPS agreements promote deeper integration.

In the light of both the economic and the legal analysis, the Report has identified several challenges for international cooperation, and the WTO more specifically. First, the transparency of non-tariff measures and services measures must be improved and the WTO has a central role to play with its multiple transparency mechanisms. Secondly, current WTO disciplines may not always strike the right balance between policy commitments and flexibility. For instance, economists argue in favour of a more

prominent role for non-violation complaints. Lawyers, in turn, observe that WTO members generally do not take this path, preferring to challenge the NTM on the basis of the specific rule it allegedly violates. Thirdly, more effective criteria are needed to identify why a measure is used. Better integration of economic and legal analysis may help achieve this goal.

Fourthly, the rise of global production sharing poses additional challenges for the multilateral trading system, calling for deeper integration. When interaction between firms in a supply chain involves bilateral bargaining on input prices, policies affecting the conditions of sale at one stage also affect the profits of producers at all other stages. This implies that international cooperation should go beyond market access and cover the broader set of policies affecting the conditions of sale at all stages of the supply chain. Moreover, global production sharing intensifies cross-effects and complementarities between trade in goods and trade in services. This raises the question whether such effects are sufficiently taken into account in the current negotiating framework.

A number of challenges arise more specifically in relation to cooperation on TBT/SPS measures and domestic regulation. Addressing the adverse trade effects of such measures requires regulatory convergence. As discussed in the 2011 *World Trade Report*, part of this convergence takes place at the regional level and part of it at the multilateral level, raising the question of the optimal distribution of roles. The path to convergence is not always an easy one, since it is more than a mechanical matter of policy design, and can involve national differences in social preferences and priorities. The approach in the TBT and SPS agreements of encouraging the adoption of international standards can create precisely this kind of tension.

Another issue relates to private standards. Anxiety has arisen in relation to the role that market power can play in private standard-setting and the possibility that private standards develop into government-mandated norms that may be unduly influenced by interest groups. The role of governments and of the WTO with regard to such standards would seem to be in need of clarification.

As for negotiations on domestic regulation in services mandated in the General Agreement on Trade in Services (GATS), these have turned out to be very difficult to conclude. One way to overcome concerns with regulatory autonomy, which seem to be a main stumbling block, would be to define a necessity test.

Lastly, capacity building is a vital element in improving international cooperation on TBT/SPS measures and on domestic regulation in services. In the SPS area, the Standards and Trade Development Facility has proven to be successful and the question has arisen

as to whether the model could be replicated in building capacity relating to standard-setting, technical infrastructure and the development of regulations in the TBT area. In the area of domestic regulation in services, there is a need for capacity building to strengthen the ability of regulators to identify, design and implement policies that address market failures, undertake regulatory impact assessments and share knowledge on good practices.

The Report has covered a lot of ground but it has by no means addressed all the issues surrounding non-tariff measures in the context of international cooperation. Some of the important questions touched upon, but not pursued in much depth in the Report, are listed below.

- The Report has made a strong case for improved transparency internationally in the field of non-tariff measures. This includes properly designed and observed notification procedures. However, since the administration of NTM measures can be as important as their design, is there scope for a different approach for dealing with administrative obstacles *per se*?
- The share of trade in intermediate goods in total trade has increased over the last few decades. How does the fragmentation of production across national borders affect incentives to use non-tariff measures? What are the trade effects of NTMs along value chains?
- There seem to be increasing complementarities between trade in goods and trade in services driven by global production sharing. How relevant are these complementarities? Do they require a new framework of analysis and new forms of cooperation?
- It is argued that considerable scope exists for improving domestic regulatory practices. What would be the effect of such improvements on the need for international cooperation?
- NTMs are a “moving target” and their mix is constantly evolving. Some measures, such as those related to intellectual property protection, government procurement, investment and finance measures, are not covered in this report. What challenges do these measures raise for the WTO?
- A main theme of this report is regulation aimed at achieving public policy objectives. How much of their regulatory autonomy are national governments willing to delegate to international institutions?
- A lot of the activities of the SPS and TBT committees involve information sharing, in particular on best practices. How effective is this as a mechanism of international cooperation, for

instance to increase transparency or build capacity? The specific trade concerns mechanism in the TBT and SPS committees goes beyond information sharing. Does it help resolve conflicts? Should it be used as a model by other committees?

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Technical notes

Composition of regions and other economic groupings				
Regions				
North America				
Bermuda	Canada*	Mexico*	United States of America*	
Other territories in the region not elsewhere specified (n.e.s.)				
South and Central America and the Caribbean				
Antigua and Barbuda*	Chile*	El Salvador*	Netherlands Antilles	Saint Vincent and the Grenadines*
Argentina*	Colombia*	Grenada*	Nicaragua*	Suriname*
Bahamas**	Costa Rica*	Guatemala*	Panama*	Trinidad and Tobago*
Barbados*	Cuba*	Guyana*	Paraguay*	Uruguay*
Belize*	Dominica*	Haiti*	Peru*	Bolivarian Rep. of Venezuela*
Bolivia, Plurinational State of*	Dominican Republic*	Honduras*	Saint Kitts and Nevis*	
Brazil*	Ecuador*	Jamaica*	Saint Lucia*	
Other territories in the region n.e.s.				
Europe				
Albania*	Czech Republic*	Hungary*	Malta*	Slovak Republic*
Andorra**	Denmark*	Iceland*	Montenegro*	Slovenia*
Austria*	Estonia*	Ireland*	Netherlands*	Spain*
Belgium*	Finland*	Italy*	Norway*	Sweden*
Bosnia and Herzegovina**	France*	Latvia*	Poland*	Switzerland*
Bulgaria*	FYR Macedonia*	Liechtenstein*	Portugal*	Turkey*
Croatia*	Germany*	Lithuania*	Romania*	United Kingdom*
Cyprus*	Greece*	Luxembourg*	Serbia**	
Other territories in the region n.e.s.				
Commonwealth of Independent States (CIS)^a				
Armenia*	Georgia ^a	Moldova, Republic of*	Turkmenistan	
Azerbaijan**	Kazakhstan**	Russian Federation**	Ukraine*	
Belarus**	Kyrgyz Republic*	Tajikistan**	Uzbekistan**	
Other territories in the region n.e.s.				
Africa				
Algeria**	Congo*	Guinea*	Morocco*	South Africa*
Angola*	Côte d'Ivoire*	Guinea-Bissau*	Mozambique*	Sudan**
Benin*	Dem. Rep. of the Congo*	Kenya*	Namibia*	Swaziland*
Botswana*	Djibouti*	Lesotho*	Niger*	Tanzania*
Burkina Faso*	Egypt*	Liberia, Republic of**	Nigeria*	Togo*
Burundi*	Equatorial Guinea**	Libya**	Rwanda*	Uganda*
Cameroon*	Eritrea	Madagascar*	São Tomé and Príncipe**	Uganda*
Cape Verde*	Ethiopia**	Malawi*	Senegal*	Zambia*
Central African Republic*	Gabon*	Mali*	Seychelles**	Zimbabwe*
Chad*	Gambia*	Mauritania*	Sierra Leone*	
Comoros**	Ghana*	Mauritius*	Somalia	
Other territories in the region n.e.s.				
Middle East				
Bahrain, Kingdom of*	Israel*	Lebanese Republic**	Saudi Arabia, Kingdom of*	Yemen**
Iran**	Jordan*	Oman*	Syrian Arab Republic**	
Iraq**	Kuwait, State of*	Qatar*	United Arab Emirates*	
Other territories in the region n.e.s.				
Asia				
Afghanistan**	Hong Kong, China*	Malaysia*	Papua New Guinea*	Timor-Leste
Australia*	India*	Maldives*	Philippines*	Tonga*
Bangladesh*	Indonesia*	Mongolia*	Samoa*	Tuvalu
Bhutan**	Japan*	Myanmar*	Singapore*	Vanuatu**
Brunei Darussalam*	Kiribati	Nepal*	Solomon Islands*	Viet Nam*
Cambodia*	Korea, Republic of*	New Zealand*	Sri Lanka*	
China*	Lao People's Dem. Rep.**	Pakistan*	Taipei, Chinese*	
Fiji*	Macao, China*	Palau	Thailand*	
Other territories in the region n.e.s.				

*WTO members

**Observer governments

a. Georgia is not a member of the Commonwealth of Independent States but is included in this group for reasons of geography and similarities in economic structure.

Other Groups				
ACP (African, Caribbean and Pacific countries)				
Angola	Cuba	Haiti	Niger	South Africa
Antigua and Barbuda	Dem. Rep. of the Congo	Jamaica	Nigeria	Sudan
Bahamas	Djibouti	Kenya	Niue	Suriname
Barbados	Dominica	Kiribati	Palau	Swaziland
Belize	Dominican Republic	Lesotho	Papua New Guinea	Timor-Leste
Benin	Equatorial Guinea	Liberia, Republic of	Rwanda	Togo
Botswana	Eritrea	Madagascar	Saint Kitts and Nevis	Tonga
Burkina Faso	Ethiopia	Malawi	Saint Lucia	Trinidad and Tobago
Burundi	Fiji	Mali	Saint Vincent and the Grenadines	Tuvalu
Cameroon	Gabon	Marshall Islands	Samoa	Uganda
Central African Republic	Gambia	Mauritania	São Tomé and Príncipe	United Republic of Tanzania
Chad	Ghana	Mauritius	Senegal	Vanuatu
Comoros	Grenada	Micronesia	Seychelles	Zambia
Congo	Guinea	Mozambique	Sierra Leone	Zimbabwe
Cook Islands	Guinea-Bissau	Namibia	Solomon Islands	
Côte d'Ivoire	Guyana	Nauru	Somalia	
Africa				
<i>North Africa</i>				
Algeria	Egypt	Libya	Morocco	Tunisia
<i>Sub-Saharan Africa</i>				
<i>Western Africa</i>				
Benin	Gambia	Guinea-Bissau	Mauritania	Senegal
Burkina Faso	Ghana	Liberia, Republic of	Niger	Sierra Leone
Cape Verde	Guinea	Mali	Nigeria	Togo
Côte d'Ivoire				
<i>Central Africa</i>				
Burundi	Central African Republic	Congo	Equatorial Guinea	Rwanda
Cameroon	Chad	Dem. Rep. of the Congo	Gabon	São Tomé and Príncipe
<i>Eastern Africa</i>				
Comoros	Ethiopia	Mauritius	Somalia	United Republic of Tanzania
Djibouti	Kenya	Seychelles	Sudan	Uganda
Eritrea	Madagascar			
<i>Southern Africa</i>				
Angola	Lesotho	Mozambique	South Africa	Zambia
Botswana	Malawi	Namibia	Swaziland	Zimbabwe
Territories in Africa not elsewhere specified				
Asia				
<i>East Asia (including Oceania)</i>				
Australia	Indonesia	Mongolia	Samoa	Tuvalu
Brunei Darussalam	Japan	Myanmar	Singapore	Vanuatu
Cambodia	Kiribati	New Zealand	Solomon Islands	Viet Nam
China	Lao People's Dem. Rep.	Papua New Guinea	Taipei, Chinese	
Fiji	Macao, China	Philippines	Thailand	
Hong Kong, China	Malaysia	Republic of Korea	Tonga	
<i>West Asia</i>				
Afghanistan	Bhutan	Maldives	Pakistan	Sri Lanka
Bangladesh	India	Nepal		
Other countries and territories in Asia and the Pacific not elsewhere specified				
LDCs (Least-developed countries)				
Afghanistan	Bhutan	Central African Republic	Djibouti	Gambia
Angola	Burkina Faso	Chad	Equatorial Guinea	Guinea
Bangladesh	Burundi	Comoros	Eritrea	Guinea-Bissau
Benin	Cambodia	Dem. Rep. of the Congo	Ethiopia	Haiti

Kiribati	Maldives	Niger	Solomon Islands	Uganda
Lao People's Dem. Rep.	Mali	Rwanda	Somalia	United Republic of Tanzania
Lesotho	Mauritania	Samoa	Sudan	Vanuatu
Liberia, Republic of	Mozambique	São Tomé and Príncipe	Timor-Leste	Yemen
Madagascar	Myanmar	Senegal	Togo	Zambia
Malawi	Nepal	Sierra Leone	Tuvalu	
Six East Asian traders				
Hong Kong, China	Republic of Korea	Singapore	Taipei, Chinese	Thailand
Malaysia				
Regional Integration Agreements				
Andean Community (CAN)				
Bolivia, Plurinational State of	Colombia	Ecuador	Peru	
ASEAN (Association of South East Asian Nations) / AFTA (ASEAN Free Trade Area)				
Brunei Darussalam	Indonesia	Malaysia	Philippines	Thailand
Cambodia	Lao People's Dem. Rep.	Myanmar	Singapore	Viet Nam
CACM (Central American Common market)				
Costa Rica	El Salvador	Guatemala	Honduras	Nicaragua
CARICOM (Caribbean Community and Common Market)				
Antigua and Barbuda	Belize	Guyana	Montserrat	Saint Vincent and the Grenadines
Bahamas	Dominica	Haiti	Saint Kitts and Nevis	Suriname
Barbados	Grenada	Jamaica	Saint Lucia	Trinidad and Tobago
CEMAC (Economic and Monetary Community of Central Africa)				
Cameroon	Chad	Congo	Equatorial Guinea	Gabon
Central African Republic				
COMESA (Common Market for Eastern and Southern Africa)				
Burundi	Egypt	Libya	Rwanda	Uganda
Comoros	Eritrea	Madagascar	Seychelles	Zambia
Dem. Rep. of the Congo	Ethiopia	Malawi	Sudan	Zimbabwe
Djibouti	Kenya	Mauritius	Swaziland	
ECCAS (Economic Community of Central African States)				
Angola	Central African Republic	Dem. Rep. of the Congo	Gabon	São Tomé and Príncipe
Burundi	Chad	Equatorial Guinea	Rwanda	
Cameroon	Congo			
ECOWAS (Economic Community of West African States)				
Benin	Côte d'Ivoire	Guinea	Mali	Senegal
Burkina Faso	Gambia	Guinea-Bissau	Niger	Sierra Leone
Cape Verde	Ghana	Liberia, Republic of	Nigeria	Togo
EFTA (European Free Trade Association)				
Iceland	Liechtenstein	Norway	Switzerland	
European Union (27)				
Austria	Estonia	Ireland	Netherlands	Spain
Belgium	Finland	Italy	Poland	Sweden
Bulgaria	France	Latvia	Portugal	United Kingdom
Cyprus	Germany	Lithuania	Romania	
Czech Republic	Greece	Luxembourg	Slovak Republic	
Denmark	Hungary	Malta	Slovenia	
GCC (Gulf Cooperation Council)				
Bahrain, Kingdom of	Oman	Qatar	Saudi Arabia, Kingdom of	United Arab Emirates
Kuwait, State of				
MERCOSUR (Southern Common Market)				
Argentina	Brazil	Paraguay	Uruguay	
NAFTA (North American Free Trade Agreement)				
Canada	Mexico	United States		

SAPTA (South Asian Preferential Trade Arrangement)				
Bangladesh	India	Nepal	Pakistan	Sri Lanka
Bhutan	Maldives			
SADC (Southern African Development Community)				
Angola	Lesotho	Mauritius	South Africa	Zambia
Botswana	Madagascar	Mozambique	Swaziland	Zimbabwe
Dem. Rep. of the Congo	Malawi	Namibia	United Republic of Tanzania	
WAEMU (West African Economic and Monetary Union)				
Benin	Côte d'Ivoire	Mali	Senegal	Togo
Burkina Faso	Guinea-Bissau	Niger		

WTO members are frequently referred to as "countries", although some members are not countries in the usual sense of the word but are officially "customs territories". The definition of geographical and other groupings in this report does not imply an expression of opinion by the Secretariat concerning the status of any country or territory, the delimitation of its frontiers, nor the rights and obligations of any WTO member in respect of WTO agreements. The colours, boundaries, denominations and classifications in the maps of the publication do not imply, on the part of the WTO, any judgement on the legal or other status of any territory, or any endorsement or acceptance of any boundary.

Throughout this report, South and Central America and the Caribbean is referred to as South and Central America. The Bolivarian Republic of Venezuela; Hong Kong Special Administrative Region of China; the Republic of Korea; and the Separate Customs Territory of Taiwan, Penghu, Kinmen and Matsu are referenced as Bolivarian Rep. of Venezuela; Hong Kong, China; Korea, Republic of; and Taipei, Chinese respectively.

The closing date for data used within this report is 12 April 2012.

Abbreviations and symbols

ACP	African, Caribbean and Pacific Group of States
AD	anti-dumping
ALOP	appropriate levels of protection
AMS	Aggregate Measurement of Support
AOA	Agreement on Agriculture (WTO)
APC	Australia Productivity Commission
AQSIQ	General Administration of Quality Supervision, Inspection and Quarantine of China
APEC	Asia Pacific Trade Agreement
ASEAN	Association of Southeast Nations
ASP	American selling price
ATFS	American Tree Farm System
AVE	ad-valorem equivalent
BE	barriers to entry
BFAI	Foreign Trade Information Office of Germany
BSE	bovine spongiform encephalopathy
BT	barriers to trade and investment
c.i.f.	cost-insurance-freight
CARS	Consumer assistance to recycle and save
CEPR	Centre for Economic Policy Research
CERFLOR	Forest Certification Programme
CIS	Commonwealth of Independent States
COMESA	Common Market for Eastern and Southern Africa
CoOP	country of origin principle
DCs	Developing countries
DG SANCO	European Commission Directorate-General for Health and Consumers
DP	discriminatory procedures
EAC	East African Community
ECLAC	Economic Commission for Latin America and the Caribbean
EEMRA	Electrical and Electronic Equipment Mutual Recognition Arrangement
EFTPOS	Electronic funds transfer at point of sale
EFW	Economic Freedom of the World
ERM	environment-related measures
ESCAP	Economic and Social Commission for Asia and the Pacific
ETCR	electricity, gas, transport and communications
ETI	Enabling Trade Index
EU	European Union
f.o.b.	free-on-board
FAO	Food and Agricultural Organization
FDI	Foreign direct investment
FER	foreign equity restrictions
FSAP	Financial Services Action Plan
FSC	Forest Stewardship Council
GATS	General Agreement on Trade in Services
GATT	General Agreement on Tariffs and Trade
GFSI	Global Food Safety Initiative
GRP	Good Regulatory Practices
GTA	Global Trade Alert
HACCP	hazard analysis and critical control points
HS	harmonized system
IASC	International Accounting Standards Committee
IEC	International Electrotechnical Commission
IFAC	International Federation of Accountants
IFO	German Institute for Economic Research
IMS	Information Management Systems
IOSCO	International Organization of Securities Commissions
IPCC	Intergovernmental Panel on Climate Change
IPPC	International Plant Protection Convention
ISO	International Organization for Standardization
ITC	International Trade Centre
I-TIP	Integrated Trade Intelligence Portal
ITO	International Trade Organization
ITU	International Telecommunications Union

KPE	key foreign personnel
LDCs	least-developed countries
LEI	Indonesian Ecolabelling Institute
LTA	Long-term-arrangement
MFN	most favoured nation
MRA	mutual recognition agreement
MRLs	maximum residual levels
MTCS	Malaysian Timber Certification Scheme
NAMA	Non-Agriculture Market Access
n.e.s.	not elsewhere specified
NMS	non-manufacturing sectors
NMR	non-manufacturing regulation
NTE	National Trade Estimate
NTMs	non-tariff measures
OECD	Organization for Economic Cooperation and Development
OIE	World Organization for Animal Health
OTR	other restrictions
OTRI	Overall Trade Restrictiveness Index
PCA	principal component analysis
PEFC	Programme for the Endorsement of Forest Certification
PMR	product market regulation
PSI	Pre-shipment inspection
PTA	preferential trade agreement
RAPEX	Rapid Alert System for Non-Food Products
SADC	Southern African Development Community
SARSO	South Asian Regional Standards Organization
SCR	screening and approval
SCSC	Sub-committee on Standards and Conformance
SITC	Standard International Trade Classification
SPS	sanitary and phytosanitary
STCs	Specific Trade Concerns
STDF	Standards and Trade Development Facility
STEs	State trading enterprises
STRI	Services Trade Restrictiveness Indexes
TBT	technical barriers to trade
TPP	Trans-Pacific Partnership
TPR	Trade Policy Review
TPRB	Trade Policy Review Body
TRAINS	Trade Analysis and Information System
TRIPS	trade-related aspects of intellectual property rights
TTMRA	Trans-Tasman Mutual Recognition Arrangement
TTRI	Tariff Trade Restrictiveness Index
UK	United Kingdom
UNCTAD	United Nations Conference on Trade and Development
UNECE	United Nations Economic Commission for Europe
UNEP	United Nations Environmental Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCC	United Nations Framework Convention on Climate Change
UR	Uruguay Round
US	United States
USITC	United States International Trade Commission
USO	Universal services obligation
USTR	United States Trade Representative
VAT	value-added tax
WHO	World Health Organization
WITS	World Integrated Trade System
WTO	World Trade Organization

The following symbols are used in this publication:

...	not available
0	figure is zero or became zero due to rounding
-	not applicable
US\$	United States dollars
€	euro
£	UK pound

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WTO members

(As of 10 May 2012)

Albania	The Gambia	Nicaragua
Angola	Georgia	Niger
Antigua and Barbuda	Germany	Nigeria
Argentina	Ghana	Norway
Armenia	Greece	Oman
Australia	Grenada	Pakistan
Austria	Guatemala	Panama
Bahrain, Kingdom of	Guinea	Papua New Guinea
Bangladesh	Guinea-Bissau	Paraguay
Barbados	Guyana	Peru
Belgium	Haiti	Philippines
Belize	Honduras	Poland
Benin	Hong Kong, China	Portugal
Bolivia, Plurinational State of	Hungary	Qatar
Botswana	Iceland	Romania
Brazil	India	Rwanda
Brunei Darussalam	Indonesia	Saint Kitts and Nevis
Bulgaria	Ireland	Saint Lucia
Burkina Faso	Israel	Saint Vincent & the Grenadines
Burundi	Italy	Samoa
Cambodia	Jamaica	Saudi Arabia, Kingdom of
Cameroon	Japan	Senegal
Canada	Jordan	Sierra Leone
Cape Verde	Kenya	Singapore
Central African Republic	Korea, Republic of	Slovak Republic
Chad	Kuwait, the State of	Slovenia
Chile	Kyrgyz Republic	Solomon Islands
China	Latvia	South Africa
Colombia	Lesotho	Spain
Congo	Liechtenstein	Sri Lanka
Costa Rica	Lithuania	Suriname
Côte d'Ivoire	Luxembourg	Swaziland
Croatia	Macao, China	Sweden
Cuba	Madagascar	Switzerland
Cyprus	Malawi	Chinese Taipei
Czech Republic	Malaysia	Tanzania
Democratic Republic of the Congo	Maldives	Thailand
Denmark	Mali	Togo
Djibouti	Malta	Tonga
Dominica	Mauritania	Trinidad and Tobago
Dominican Republic	Mauritius	Tunisia
Ecuador	Mexico	Turkey
Egypt	Moldova, Republic of	Uganda
El Salvador	Mongolia	Ukraine
Estonia	Montenegro	United Arab Emirates
European Union	Morocco	United Kingdom
Fiji	Mozambique	United States of America
Finland	Myanmar	Uruguay
Former Yugoslav Republic of Macedonia (FYROM)	Namibia	Venezuela, Bolivarian Republic of
France	Nepal	Viet Nam
Gabon	Netherlands	Zambia
	New Zealand	Zimbabwe

Previous World Trade Reports

The WTO and preferential trade agreements: From co-existence to coherence

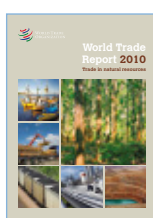
2011



The ever-growing number of preferential trade agreements (PTAs) is a prominent feature of international trade. The Report describes the historical development of PTAs and the current landscape of agreements. It examines why PTAs are established, their economic effects, the contents of the agreements themselves, and the interaction between PTAs and the multilateral trading system.

Trade in natural resources

2010



The World Trade Report 2010 focuses on trade in natural resources, such as fuels, forestry, mining and fisheries. The Report examines the characteristics of trade in natural resources, the policy choices available to governments and the role of international cooperation, particularly of the WTO, in the proper management of trade in this sector.

Trade policy commitments and contingency measures

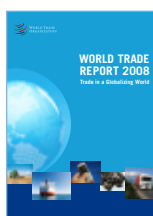
2009



The 2009 Report examines the range and role of contingency measures available in trade agreements. One of the Report's main objectives is to analyse whether WTO provisions provide a balance between supplying governments with the necessary flexibility to face difficult economic situations and adequately defining these in a way that limits their use for protectionist purposes.

Trade in a globalizing world

2008



The 2008 Report provides a reminder of what we know about the gains from international trade and highlights the challenges arising from higher levels of integration. It addresses the question of what constitutes globalization, what drives it, what benefits it brings, what challenges it poses and what role trade plays in this world of ever-growing inter-dependency.

Sixty years of the multilateral trading system: achievements and challenges

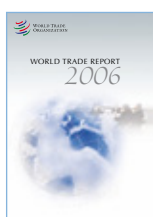
2007



On 1 January 2008 the multilateral trading system celebrated its 60th anniversary. The World Trade Report 2007 celebrates this landmark anniversary with an in-depth look at the General Agreement on Tariffs and Trade (GATT) and its successor the World Trade Organization — their origins, achievements, the challenges they have faced and what the future holds.

Exploring the links between subsidies, trade and the WTO

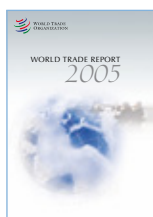
2006



The World Trade Report 2006 focuses on how subsidies are defined, what economic theory can tell us about subsidies, why governments use subsidies, the most prominent sectors in which subsidies are applied and the role of the WTO Agreement in regulating subsidies in international trade. The Report also provides brief analytical commentaries on certain topical trade issues.

Trade, standards and the WTO

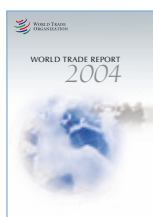
2005



The World Trade Report 2005 seeks to shed light on the various functions and consequences of standards, focusing on the economics of standards in international trade, the institutional setting for standard-setting and conformity assessment, and the role of WTO agreements in reconciling the legitimate policy uses of standards with an open, non-discriminatory trading system.

Coherence

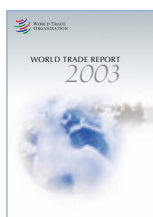
2004



The World Trade Report 2004 focuses on the notion of coherence in the analysis of interdependent policies: the interaction between trade and macroeconomic policy, the role of infrastructure in trade and economic development, domestic market structures, governance and institutions, and the role of international cooperation in promoting policy coherence.

Trade and development

2003



The World Trade Report 2003 focuses on development. It explains the origin of this issue and offers a framework within which to address the question of the relationship between trade and development, thereby contributing to more informed discussion.

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Cover designed by triptik
Report designed by Services Concept
Printed by Atar Roto Presse SA

© World Trade Organization 2012
ISBN 978-92-870-3815-9
Published by the World Trade Organization.

World Trade Report 2012

The *World Trade Report 2012* ventures beyond tariffs to examine other policy measures that can affect trade. Regulatory measures for trade in goods and services raise new and pressing challenges for international cooperation in the 21st century. More than many other measures, they reflect public policy goals (such as ensuring the health, safety and well-being of consumers) but they may also be designed and applied in a manner that unnecessarily frustrates trade. The focus of this report is on technical barriers to trade (TBT), sanitary and phytosanitary (SPS) measures (concerning food safety and animal/plant health) and domestic regulation in services.

The Report examines why governments use non-tariff measures (NTMs) and services measures and the extent to which these measures may distort international trade. It looks at the availability of information on NTMs and the latest trends concerning usage. The Report also discusses the impact that NTMs and services measures have on trade and examines how regulatory harmonization and/or mutual recognition of standards may help to reduce any trade-hindering effects.

Finally, the Report discusses international cooperation on NTMs and services measures. It reviews the economic rationale for such cooperation and discusses the efficient design of rules on NTMs in a trade agreement. It examines how cooperation has occurred on TBT/SPS measures and services regulation in the multilateral trading system, and within other international forums and institutions. A legal analysis is provided regarding the treatment of NTMs in WTO dispute system and interpretations of the rules that have emerged in recent international trade disputes. The Report concludes with a discussion of outstanding challenges and key policy implications.

