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PAYOFF FROM THE WORLD TRADE AGENDA 2013

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EXECUTIVE SUMMARY

Contrary to many observers, we do not abandon the Doha Development Round as a lost cause. Instead, this report takes a fresh look, and assesses the potential payoffs from seven agreements that could be concluded in 2013 and ratified in 2014. We variously use three metrics to quantify potential payoffs for the world: export gains, jobs supported, and GDP gains (or losses averted). The concept of "jobs supported" through larger exports of goods and services is not equivalent to "jobs added," since two-way trade expansion generally affects the composition of a nation's employment rather than its absolute level, shifting the labor force from less to more productive sectors of the economy. That said, increased trade means more jobs in the export sector and export jobs are generally better paid than jobs in other sectors of the economy.

The table below summarizes our findings of the potential payoffs for the world. These payoffs are broad estimates and represent permanent annual static gains for the world economy.

Potential long-term payoffs from the world trade agenda

Agenda topic	**Export gains** (billions)	**Export jobs supported** (millions)	**GDP increase** ($ billions)
Trade facilitation	1 043	20,6	960
International services	1 129	8,6	1 039
International digital economy	178	3,7	147
DFQF market access	8	0,7	7
Agricultural subsidies	5	0,1	5
Food export controls*	n.a.	n.a.	45
Environmental goods and services	10	0,3	9
Total	2 374	34,1	2 212

n.a. = not applicable

*GDP gains calculated as losses averted.

Source: Authors' calculations.

If all seven agreements were ratified, the total global export gains over the medium term might exceed $2 trillion; total global jobs supported by export expansion could number 34 million; and

global GDP gains combined with losses averted could amount to $2 trillion. Among the agreements, outcomes on trade facilitation and services would have the largest relative global impact.

In addition, this report examines enhanced WTO approaches to regional trading arrangements, new investment rules, and dispute settlement. The potential payoffs from progress on these subjects do not lend themselves to quantification. The value of contemplated improvements in these areas derives from the "insurance policy" aspect of international trade obligations. "Policy predictability" is an intangible but invaluable asset for business firms planning their trade and investment strategies.

Following recent meetings on the sidelines of the World Economic Forum in January 2013, a broad consensus emerged that potential outcomes for the Bali WTO Ministerial in December 2013 include a trade facilitation agreement, and agreements on issues related to agriculture and least developed countries. While these issues are considered the most likely to attract sufficient support among members in the near-term, there is less optimism that agreements on other issues can be reached in the next year. At the same time, many officials and experts alike believe that the future credibility of the WTO and multilateralism writ large depends critically on achieving a robust outcome at the Bali Ministerial Conference in December 2013.

To that end, our analysis examines areas where agreement is feasible and can be accomplished in an expeditious manner. The objective is to provide a menu of options for what we call a "WTO Recovery Package" that could be advanced in 2013. We do not suggest that the seven agreements assessed here should be viewed as a "package" – the "all-or-nothing" approach would doom the enterprise from the start, just as the "single undertaking" proved to be a fatal flaw in the original Doha Declaration. However, to reap a decent harvest from progress made in the Doha Round, WTO members should gladly accept the variable architecture outlined here.

1. INTRODUCTION

The great global recession – triggered in 2008 by the US mortgage crisis and augmented by the EU sovereign debt crisis – has hammered world trade and investment. Throughout the recession, responsible officials failed to throw the lifeline of fresh liberalization; instead they tolerated protectionism in various guises. While foreign direct investment flows reached $2.1 trillion in 2007, in the years since they have averaged below $1.5 trillion. World trade bounced back to its 2008 level in 2010, but with the tepid recovery and no meaningful progress in liberalization, world trade is no longer substantially outpacing real global GDP growth; indeed, global trade grew by less than GDP in 2012 (2.5 percent) and is projected to only modestly rebound to 4.5 percent in 2013.

According to Angus Maddison, the post-Second World War era delivered the best 60 years in world history. During this period, globalization powered world prosperity, with trade and investment growing much faster than other components of the world economy. In the wake of financial crises, failure in the Doha Round talks, coupled with creeping protectionism through trade remedies, local content requirements, and discriminatory regulatory practices, trade and investment are no longer expanding at a faster clip than world GDP. It's not that opportunities are lacking: credible econometric research shows that global trade densities are less than a third of their potential; moreover, when measured in tariff-equivalent terms, the "border effect" of tariff and non-tariff barriers approaches 100 percent. The problem is that responsible policy officials are not rising to the challenge by energetically dismantling barriers that impede trade and investment flows. In fact, protectionist measures are on the rise. In 2012, the number of newly documented protectionist measures outnumbered trade – liberalizing or transparency – improving measures by roughly 5 to 1 (Evenett 2012). The stock of protectionist measures implemented since the first G20 summit in October 2008 and still in force numbers 1414 measures – the great majority by G20 countries. During that time period, the number of cases brought to the WTO for dispute settlement also increased, suggesting that the "glass house" syndrome that kept protectionism at bay during the early years of the global financial crisis is starting to wane.

The past decade has been rough for the World Trade Organization – specifically for the efforts of trade negotiators to reach a package agreement, even while trade jurists have performed their task of adjudicating disputes with admirable skill and speed. Doha Round negotiations are on the verge of catastrophic failure. The multilateral trading system will be dealt a near fatal blow if nothing results from 12 years of hard negotiations. Prospects for resurrecting the WTO as the premier forum for trade negotiations will be crippled if the work of the Doha Round is cast aside. In short, the year 2013 is shaping up as the "make or break" year for multilateral trade negotiations.

Despite negative media commentary and political neglect, this report takes an optimistic view of prospects for 2013. With a concerted effort, major trading nations can construct a "WTO Recovery Package". The world economy needs strong medicine to escape the hangover from US and EU financial failures and successful trade talks can be part of the elixir. Fortunately, significant agreements can be harvested from the Doha drafts, either individually or as packages. Years of skilled work are now captured in draft texts, and most remaining differences between WTO members are political not technical. Senior officials need to focus on the global commercial payoff from a significant "WTO Recovery Package" – not their mercantalistic calculations of the "balance of concessions", a form of arithmetic which inevitably shrinks the deal. In decades past, the GATT was known as a forum where countries went to "get business done" by lowering their own tariffs

and propelling growth in home and foreign economies alike. The WTO should return to these healthy roots!

Several Doha texts can be polished and ratified provided that negotiators take a flexible posture with respect to the architecture of rights and obligations. A few texts might be readily accepted by all WTO members. However, for several texts, only a subset of WTO members will be able to accept the obligations at the outset – in other words, with respect to obligations, these will be plurilateral agreements. The plurilateral agreements (and chapters within the agreements) will in turn follow two architectural models. In some cases, the agreements (or selected chapters) will extend unconditional most-favored-nation (MFN) rights either to all WTO members or to the least developed members (LDCs). This will happen when agreement members account for a high percentage of world trade in the concerned sector (even if short of a "critical mass", customarily defined as more than 90 percent of world trade). In other cases, the agreements will condition extension of rights on acceptance of obligations – which in practice means membership in the plurilateral agreement. To reap a decent harvest from the Doha Round, WTO members should gladly accept the variable architecture outlined here.

In addition, WTO members should show flexibility when it comes to packaging the harvest. This report sizes up the payoff from several texts that seem ripe for broad acceptance. It would be unfortunate if any WTO member adopts a rigid posture as to which texts must be grouped together to form an acceptable package. That kind of rigidity would replicate the "single undertaking" commitment which proved to be one of the fatal flaws in the Doha negotiations.

The chapters that follow describe several subjects and give rough estimates of the potential trade expansion, the jobs that could be created, and the GDP gains that could be realized if WTO members reach agreement. Near-final text is in hand for many but not all the subjects. The subjects addressed with quantitative estimates in this report are:

- The Trade Facilitation agreement
- The International Services Agreement
- The International Digital Economy Agreement (IDEA)
- Duty-free quota-free (DFQF) market access for Least Developed Countries (LDCs)
- Phase-out agricultural export subsidies
- Renounce food export controls
- Freer trade in environmental goods and services

In addition, this report discusses enhanced WTO approaches to regional trading arrangements, new investment rules, and dispute settlement. The potential gains from progress on these subjects do not lend themselves to quantification. The value of contemplated improvements in these areas derives from the "insurance policy" aspect of international trade obligations – the increased assurance that WTO commitments will be faithfully implemented and enforced and that market access guarantees will not be circumvented by restrictions on establishment or other investment policy measures. "Policy predictability" is an intangible but invaluable asset for firms planning trade and investment strategies.

2. TRADE FACILITATION

Introduction

Potential economic gains from trade facilitation are no secret. Reducing trade transaction costs (TTC) and moving goods around the world quickly and cheaply translates into more trade and higher incomes. Supporting evidence comes from empirical work that measures the payoffs associated with targeted policies that facilitate trade. Moïsé, Orliac and Minor (2011) find that measures which simplify trade procedures can potentially reduce TTCs by 5.4 percent. Helble, Mann and Wilson (2009) estimates that every dollar spent on trade facilitation in aid-for-trade countries (e.g. better customs procedures, more efficient ports) increases a country's trade volume by $6.37 annually.[1]

Additional trade translates directly into GDP gains. For developed countries, the estimated $950 billion increase in two-way trade, as a consequence of significant trade facilitation, delivers GDP increases of approximately $440 billion.[2] For developing countries, the estimated $1 trillion increase in two-way trade delivers GDP increases of $520 billion. Overall, the potential trade expansion from a far-reaching trade facilitation agreement could translate to world GDP increases of $960 billion annually.

Payoff from Trade Facilitation

A large share of 21st century trade requires integrated global supply chains that move intermediate and finished goods around the world. Intermediate goods account for 60 percent of global commerce, and about 30 percent of total trade is conducted between affiliates of the same multinational corporation.[3] This means that, to remain competitive, countries must ensure that every stage of the supply chain is fast and efficient. Indeed, research shows that poor logistics directly reduce trade volumes for goods and services alike. The World Economic Forum estimates, in *Global Enabling Trade Report 2012*, that a 10 percent worsening in its Enabling Trade Index (ETI) translates, on average, into a 40 percent fall in two-way merchandise trade.[4]

Trade Gains

Other empirical studies show a parallel correlation between improvements in trade facilitation and increased trade volumes. Table 2.1 summarizes the estimates of the effect on exports from improvements to trade facilitation done by Hufbauer, Vieiro and Wilson (2012). The authors draw on the work of Portugal-Perez and Wilson (2010) who used a standard gravity model to simulate the impact of aggregate indicators of a country's trading environment. The indicators include

1 See Helble, Mann, and Wilson (2009), table 5b estimates for all aid-for-trade facilitation (A4TF).

2 Two-way trade gains are shown in table 2.3. GDP increases are estimated by applying the average dollar ratio from Table A.3, namely 0.46. See Appendix A for an explanation of the methodology used for calculating GDP increases.

3 Gary Clyde Hufbauer, Martin Vieiro and John S. Wilson, "Trade Facilitation Matters!" VoxEU, September 14, 2012, www.voxeu.org (accessed on December 10, 2012).

4 The ETI measures the extent to which countries have developed institutions, policies and services facilitating the free flow of goods across borders. For a more detailed explanation of the ETI and methodology used to calculate the effects on trade see: "The Global Enabling Trade Report 2012: Reducing Supply Chain Barriers." Geneva: World Economic Forum's Committee to Improve the State of the World.

categories such as port characteristics, services and customs administration. The categories are further broken down into "hard" and "soft" infrastructure. The authors carry out a mental experiment by assuming that countries lift their indicator values halfway to the region's top performer in each category. According to their calculations, the resulting improvement in trade facilitation could boost total merchandise exports of developing countries by $1,137 billion and total exports of developed countries by $949 billion. For the calculations in this Policy Brief, we halve the estimates of export gains from Hufbauer, Vieiro and Wilson (2012). We do this because the trade facilitation agreement would only represent the beginning and not the end of the road in slashing trade costs. Conservative estimates better reflect the potential trade gains from an agreement that will not immediately resolve critical issues affecting trade costs.[5] However, we estimate that significant improvements in trade facilitation could increase exports of developing countries by approximately $570 billion and exports of developed countries by $475 billion. Taken together, this would translate into more than $1 trillion world export gains.

Helble, Mann and Wilson (2011) examine the connection between aid-for-trade (AfT) – one channel of improved trade facilitation – and merchandise trade performance. Regression analysis showed that aid recipients benefitted significantly from AfT programs. Their results yield coefficients in the range of 0.004 to 0.006. This implies, for a coefficient of 0.006, that a 10 percent increase in AfT will boost merchandise trade by 6/100 of 1 percent. While this figure may seem small, AfT flows are modest relative to the total merchandise trade of developing countries. In practice, a 10 percent increase in AfT flows, above the 2010 level, would amount to around $2.2 billion. In 2010, merchandise exports of developing countries were roughly $5.7 trillion, while merchandise imports amounted to $5.5 trillion.[6] Therefore an increase of 6/100 of 1 percent would deliver export gains of $3.4 billion and import gains of $3.3 billion – in other words, total two-way trade gains of $6.7 billion. This would be a handsome payoff for an aid increase of $2.2 billion (Hufbauer, Muir and Wilson 2012).

Jobs Supported

Table 2.2 outlines the additional jobs supported from improved policies on trade facilitation, following the methodology explained in Appendix A. Jobs coefficients are derived from employees per billion US dollars of GDP in tradable sectors of the economy (based on value added in industry) for developed and developing countries. These jobs coefficients are applied to the increase in merchandise exports from table 2.1. While developed countries in aggregate would add about 3 million jobs, developing countries would reap the largest gains, adding roughly 18 million jobs. However, within developing countries the distribution of gains varies significantly by region – 60 percent of the potential employment gains would go to East Asia with more than 11 million jobs, and 16 percent would go to Latin America and the Caribbean with roughly 3 million jobs. In relative terms, Sub-Saharan Africa and Eastern Europe and Central Asia would see more modest gains of 1 million and 2 million jobs, respectively. In total, trade facilitation improvements would translate to global job gains of 21 million. While this estimate represents ambitious improvements, and while realization of the gains would take several years, the calculation illustrates the potential for significant payoffs from trade facilitation, in particular for developing economies.

5 The specific issues that affect trade costs are discussed in more depth at the end of this chapter.

6 Data for merchandise trade of developing countries is taken from the IMF Direction of Trade Statistics, using the category of "emerging and developing economies."

GDP Increases

The payoffs of trade facilitation extend beyond trade gains. The payoffs from cutting red tape, removing technical barriers and improving infrastructure and customs procedures translate into higher productivity and larger incomes. Table 2.3 shows the estimated GDP increases by region. Again we refer to the methodology explained in Appendix A. To calculate the GDP increase resulting from $1 trillion of additional world exports, we use the average "dollar ratio" from table A.3, namely 0.46. Since "dollar ratios" are based on two-way trade gains, we double the calculated exports, under the assumption that additional imports will equal additional exports for the world as a whole and roughly for each region. We estimate that the two-way trade gains of $2 trillion delivered by meaningful trade facilitation would translate to world GDP increases of approximately $960 billion. Developing countries would enjoy 55 percent of these gains ($520 billion), while developed countries would enjoy 45 percent ($440 billion).

A recent report, *Enabling Trade: Valuing Growth Opportunities* released by the World Economic Forum (WEF) in 2013, estimates the payoffs from improving trade facilitation in both an ambitious scenario and a modest scenario, in which the estimated gains are broadly similar to those reported in this policy brief. The report assesses the economic impact of reducing supply chain barriers through gravity model analysis and 18 case studies of multinationals from varying industries. The gains from improvements to trade facilitation are quantified based on four main areas that impact supply chains: market access, border administration, telecommunications and transportation infrastructure, and the business environment.[7]

WEF et al. (2013) estimates that if countries made improvements in two main areas – border administration and telecommunications and transport infrastructure – halfway to the global best practices, world GDP could increase by $2.6 trillion or 4.7 percent, and world exports of goods could increase by $1.6 trillion or 14.5 percent.[8] This represents the "ambitious scenario." If countries improved these factors more modestly, halfway to the region's best practices, world GDP could increase by $1.5 trillion or 2.6 percent, and world exports of goods could increase by $1.0 trillion or 0.4 percent.

Based on global GDP per employed person, the report roughly estimates that potential GDP increases of $2.6 trillion in the ambitious scenario could translate to global employment gains of 137 million jobs, while more modest GDP increases of $1.5 trillion could translate to an additional 76 million global jobs.[9]

7 For more background on these indicators see WEF's *Global Enabling Trade Report 2012*.

8 The report argues that these gains are significantly larger than the potential gains from eliminating tariff barriers: an estimated $0.4 trillion or 0.6 percent in world GDP and $1.1 trillion or 10.1 percent increase in world exports. Thus, GDP gains from reducing supply chain barriers could be more than 6 times higher than the gains from reducing tariffs. The larger relative gains from trade facilitation are attributed to the reduction of resource waste versus the mere reallocation of resources, as well as to a wider distribution, as almost all countries would gain from lower transaction costs (see WEF et al. 2013, pp. 4).

9 Conversely, the study also roughly estimates more modest job gains using employment elasticities estimated by the IMF: for every 1 percent increase in GDP, employment increases by a range of 0.3 to 0.8 percent. Applying the range's upper bound to the ambitious scenario of a $2.6 trillion increase in GDP, global jobs could expand by approximately 110 million. Applying the range's lower bound to the more modest scenario of a $1.5 trillion increase in GDP, global jobs could expand by about 23 million. The latter estimate is similar to the jobs supported from trade facilitation estimated in this policy brief, namely 21 million.

The estimated gains from reducing supply chain barriers based on the WEF's modest scenario are roughly similar to the gains estimated in this policy brief: a $1.5 trillion increase in world GDP as compared to $960 billion, and a $1.0 trillion increase in world exports as compared to $1.0 trillion, respectively. However, WEF et al. (2013) estimates are also conservative as they reflect improvements in only two of the four areas that affect supply chain barriers.[10]

WTO Trade Facilitation Agreement

Trade facilitation negotiations were formally launched in 2004, as part of the "July package" of the Doha Round. WTO members committed to improve GATT Article V (freedom of transit), Article VIII (fees and formalities connected with importation and exportation), and Article X (publication and administration of trade regulations), with a view to "further expediting the movement, release and clearance of goods, including goods in transit."[11] Members also agreed to work on enhancing technical assistance and support for capacity building, taking into account the needs and concerns of least-developed countries.

WTO members have now drafted a nearly complete text that has the greatest potential of any "early harvest" package.[12] More recently, a smaller group of WTO members have discussed the possibility of concluding a stand-alone agreement on trade facilitation.[13] Yet obstacles to a successful conclusion of the trade facilitation negotiations remain. The main "sticking points" take two forms: opposition to concluding a stand-alone agreement; and concerns regarding special and differential treatment for least developed countries.[14]

The Organization of Economic Cooperation and Development (OECD) undertook a pioneering study that assessed the economic and trade impact of specific trade facilitation measures. The authors (Moïsé, Orliac and Minor 2011) constructed twelve trade facilitation indicators (TFIs) corresponding to the twelve articles of the WTO Draft Consolidated Negotiating Text on trade facilitation.[15] Their results, summarized in table 2.4, show that the implementation of all TFIs could produce, on average, a 10 percent reduction in trade costs. Through regression analysis the authors find that the most significant contribution to reducing trade costs are: (h) formalities and procedures and (c) advance rulings.[16] These measures have the potential to reduce trade costs by 5.4 percent and 3.7 percent, respectively.

10 If countries also similarly improved market access (non-tariff measures, SPS/TBT requirements, licensing, rules of origin, etc.) and the business environment (regulatory system, investment policy, etc.) the overall economic gains could increase by 70 percent (WEF et. al 2013, pp. 14).

11 World Trade Organization, "Annex D Modalities for Negotiations on Trade Facilitation," Doha Work Programme Decision Adopted by the General Council on 1 August 2004, http://www.wto.org/english/tratop_e/tradfa_e/tradfa_e.htm (accessed on October 3, 2012).

12 For the latest version of the draft text see "Negotiating Group on Trade Facilitation: Draft Consolidated Negotiating Text," World Trade Organization, 2012 (TN/TF/W/165.Rev.12), http://wto.org.

13 See "Lamy: Members continue to explore opportunities for Doha progress," WTO 2012 New Items, www.wto.org/english/news_e/news12_e/gc_rpt_01may12_e.htm (accessed October 4, 2012).

14 For a further discussion see pp. 19-20 in "World Trade Organization Negotiations: The Doha Development Agenda," Ian F. Fergusson, Congressional Research Services, December 12, 2011.

15 The authors used the 8th revision of the Draft Negotiating text (TN/TF/W/165/REV.8, 21 April, 2011). The most recent revision was released in May 2012 (see: TN/TF/W/165/Rev.12)

16 'Formalities – procedures' refers to measures to streamline the procedures for moving goods. For example pre-arrival processing, physical inspections and single-window processing all fall under the category of the formalities – procedures indicator.

While the trade facilitation agreement on the table in Geneva makes a good start, it represents the beginning, not the end of the road in slashing avoidable trade costs. According to authoritative sources, average world tariffs are now around 5 percent *ad valorem*, while average world trade costs are around 10 percent. As far as border barriers are concerned, trade costs remain the big obstacle. Among issues not covered in the trade facilitation agreement are rules of origin in regional trade agreements, intermodal transport frictions (boat to rail, etc.), and free trade in logistics services (customs brokers, express delivery, trucking, etc.). However, once the agreement is adopted, we can reasonably expect that progressive improvements will be made, owing to pressure from self-interested governments and business firms.

Resolving the outstanding issues in the trade facilitation negotiations should be a priority at the WTO. The payoffs are large while the implementation costs are small. Improvements to trade facilitation can dramatically reduce national TTC levels and enable developing countries to participate much more fully in the world economy.

3. INTERNATIONAL SERVICES AGREEMENT

Introduction

Expanded services trade should drive world commerce over the next two decades. Among advanced countries, more than 70 percent of private employees work in service firms, and among emerging nations the share ranges between 30 percent and 65 percent. Yet, as conventionally measured, cross-border services trade accounts for only 27 percent of world exports of goods and services (Maurer and Tschang 2011). However, the conventional measure fails to capture services delivered abroad when service firms establish affiliates in foreign countries.

One reason for the disparity between services trade and services employment is that many services remain "non-tradable" – they must be consumed in the same location where produced. Haircuts, restaurants, and taxis come to mind. But communications technology has enormously widened the range of "tradable" services. Moreover, a huge volume of services are delivered across borders through foreign direct investment (FDI). Unlike decades past, many medical, educational, legal and financial services are now traded worldwide, or delivered through local establishments of multinational corporations (MNCs). Global value chains embody business services supplied by providers spread across Asia, Europe and North America.

Table 3.1, based on J. Bradford Jensen's pioneering analysis (2011), lists the services traded between metropolitan areas within the United States and therefore potentially traded worldwide. These service industries currently employ about a quarter of the private US labor force (Hufbauer, Moran and Oldenski, forthcoming). Additionally, as mentioned, other services are delivered abroad through the mediation of foreign direct investment.

Barriers to Services Trade

Technology and FDI have rapidly broadened the range of tradable services. Nevertheless actual trade lags far behind potential trade. Possibly the most important reason is the severe array of non-tariff barriers to international commerce. Some scholars find that barriers are extremely high, often exceeding 100 percent, when expressed in tariff-equivalent terms. In table 3.2 we present more conservative estimates of the average level of tariff-equivalent barriers for several countries. As a companion exercise, Table 3.3 reports the World Bank "Services Trade Restrictiveness Index" (STRI) for several countries, carefully constructed from an array of data (Borchert, Gootiz and Mattoo 2012). While STRIs cannot be readily translated into tariff equivalent measures, the scatter plot in Figure 3.1 suggests a rough correlation between tariff-equivalent barriers and STRI levels.

However measured, barriers to service trade are formidable, and often preclude trade altogether. A few examples illustrate this problem:

- In many countries, restrictions on immigration, together with licensing requirements, essentially foreclose the temporary movement of skilled professionals who might otherwise deliver needed services.

- Most governments procure a range of services from the private sector – for example, training programs, specialized consulting, and computer expertise. However procurement is customarily limited to national firms.

- Delivery of services abroad often requires a local presence – such as a medical clinic, a university campus, or a big box retail store. These are often precluded by restricting the right of establishment for foreign firms.

Trade Gains

To size up the potential scope for increased trade in services, imagine that liberalization could raise the exports-to-sales ratio in the tradable business service sector part way to the exports-to-sales ratio for manufacturing. How big an increase in service exports would result? For the United States, the current exports-to-sales ratio for tradable business services is only 0.04; by contrast, the ratio is about 0.20 for manufactures. If policy impediments to business services trade were slashed, facilitating an increase in the exports-to-sales ratio to 0.10 – half the observed ratio for manufactures – US business service exports would grow by $300 billion annually.[17] Applying similar arithmetic to world exports of tradable services suggests world trade gains of $1.1 trillion (see table 3.4).[18] Gains of this magnitude would represent a 6 percent increase in total world exports of goods and services – a figure which suggests that the arduous task of liberalizing impediments is an effort worth undertaking.

Table 3.4 explains our calculations for estimating the payoff for OECD countries from liberalizing trade in services, based on data from 2010. For the purposes of this calculation, financial and business services are used as a rough but narrow estimate of the value added from tradable services activities.[19] Assuming an increase in the exports-to-sales ratio to 0.10, OECD countries would see a total of $720 billion potential export gains. The United States would see the largest share of these gains, some 41 percent or $296 billion new exports, followed by Japan with 13 percent or $92 billion new exports. Combining all countries, this would translate to world trade gains of around $1.1 trillion. Though these calculations are conservative estimates, they again reaffirm the potential scope for trade gains from services liberalization.

Jobs Supported

Table 3.5 translates this potential trade expansion to jobs supported. Following the methodology in Appendix A, jobs coefficients are calculated per billion dollars of services exports for the OECD member countries. These coefficients are derived from employees per billion US dollars of GDP in the tradable services sectors of the economy – defined here as financial and business services. Applying these jobs coefficients to the export gains from services liberalization, the OECD countries would collectively see jobs expand by a total of 3.6 million. The US would reap the largest gains with 1.5 million potential jobs, followed by Japan and Germany with 0.3 and 0.2 million jobs, respectively. Since the ratio of employees in the services sector to value added in services for developing countries is nearly three times the ratio for developed countries, we estimate that the global trade

17 This figure is calculated as a gain of 0.06 in the exports-to-sales ratio multiplied by $5 trillion, the current level of US sales of tradable business services (see table 3.4).

18 According to the WTO, US exports of services (as conventionally measured) were $580 billion in 2011, about one-seventh of world exports of services ($4.2 trillion).

19 The broad services categories reported by the OECD to facilitate country comparison often overlap tradable service activities with non-tradable service activities. Our rough approximation probably underestimates tradable services, as it does not capture important categories such as information technology. Nor does it capture the possibility of delivering services abroad through FDI.

gains of $1.1 trillion would translate to global employment gains of almost 9 million jobs. These rough but conservative calculations illustrate that as the range of tradable services continues to widen, services trade expansion can exert a sizable positive impact on the labor force. Liberalizing FDI in the service sectors would add to these job gains.

GDP Increases

The impact of trade gains from liberalizing trade in services extends beyond job gains and leads to higher GDP as well. The GDP increases resulting from additional services exports are reported in table 3.6 for OECD countries and for the world. Again we refer to the methodology explained in Appendix A. To calculate GDP increases we use the average dollar ratio from table A.3, namely 0.46. Since dollar ratios are based on two-way trade we double the calculated services exports. For OECD countries; accordingly, the estimated $1.5 trillion increase in two-way trade delivers GDP increases of approximately $700 billion. For the rest of the world, the estimated $700 billion increase in two-way trade delivers GDP increases of approximately $300 billion. Overall, the potential trade expansion from dismantling barriers to services trade would translate into world GDP increases of more than $1.0 trillion.

Longer term trends underscore the value of liberalized trade. In a recent book, *The Cost Disease: Why Computers Get Cheaper and Health Care Doesn't,* William Baumol reports some arresting numbers to illustrate the spiraling cost of key services which are plagued by slow productivity growth. Since the 1980s, the price of US university education is up by 440 percent and health care by 250 percent, while the consumer price index has only increased by 110 percent. Projecting these numbers, and taking into account demographic aging, Baumol warns that the United States could be spending 60 percent of its GDP on health care by 2105. One answer to this arithmetical juggernaut is dramatically liberalized trade in education and healthcare, taking advantage of every technology on the horizon: distance learning, medical tourism, diagnosis and record-keeping from abroad, and more.[20]

ISA Talks

In January 2012, negotiations were launched among 16 countries (counting the 27 members of the European Union as a single country), pointing towards an International Services Agreement, probably framed as a plurilateral accord within the General Agreement on Trade in Services (GATS) (See Hufbauer, Jensen and Stephenson). The number of participants has since risen to 19 WTO members. Benefits of the ISA will likely be extended on an unconditional MFN basis to least developed WTO members. For some services, the "really good friends of services" – as ISA countries call themselves – might account for a sufficiently large share of the world trade ("a critical mass", loosely defined as 85 percent or more) that they will have no difficulty extending fresh liberalization to all WTO members on an unconditional basis. For other services, the ISA countries may well decide to make the benefits of the agreement available to emerging nations (especially the BRICS) on a conditional basis: accept the obligations in order to secure the benefits.[21]

20 Mattoo and Rahindran (2006) examined US and foreign costs for 15 low-risk health treatments, and reported dramatic savings if performed abroad (including travel expense). However, the terms of public and private insurance operate as significant barriers to treatment outside the United States.

21 BRICS refers to Brazil, Russia, India, China, South Africa and other successful emerging countries such as Indonesia, Morocco, Colombia, and Thailand.

The United States ranks among the leaders of the ISA talks. Its negotiating partners will undoubtedly ask for market access commitments that represent US political "concessions" but deliver long-term economic benefits to the American people. In order to put "concessions" on the negotiating table, the president will need mandates from Congress that enable him to make commitments on such issues as government procurement of services from foreign firms, maritime and aviation cabotage by foreign carriers, certification of foreign clinics to deliver Medicare health benefits, and recognition of foreign professional qualifications. None of these negotiating mandates will be easy to obtain, but they are essential for the United States to lead the way in 21st century services trade.

4. INFORMATION DIGITAL ECONOMY AGREEMENT (IDEA)

Introduction

International trade in information technology (IT) products has been a key driver in global economic growth over the past two decades. Between 1990 and 1997 world trade of office and telecom equipment grew, on average, 12 percent a year. By 1997 telecommunications equipment accounted for roughly 13 percent of world merchandise exports; more than mining (11 percent), agricultural products (11 percent) and automotive products (9 percent) (WTO 1998). Between 1996 and 2010 world exports of IT products nearly tripled, from just over $500 billion in 1996 to $1.4 trillion in 2010.[22] During this period, world exports of IT products grew more rapidly than world trade in most other manufactured products (Mann and Lui 2007). In 2010 world exports of IT accounted for nearly 10 percent of world merchandise exports, still more than agricultural products (9 percent) or automotive products (7 percent) (WTO 2012).

IT products and services play a crucial role in economic development. Fliess and Sauvé (1997) note that information technologies are essential in transforming both industrial and social structures, for example, by providing enhanced access to higher quality education, health services, improved business and manufacturing efficiency. Mann and Lui (2007) find that the broad-based use of general purpose technologies contributes to accelerated productivity growth. Positive effects are particularly strong in developing countries. Weller and Woodcock (2012) reports that the expansion of the internet has increased the conduct of commercial transactions electronically, resulting in lower prices, greater efficiency and innovation and has narrowed the "digital divide" between OECD countries and the developing world. What's more, electronic transactions reduce trade costs, allowing greater market participation. A recent report by eBay (2012), finds that the friction cost of distance is 2.3 times greater in offline trade than online. The eBay report also shows that online trade allows small business firms to export at almost the same frequency as large business firms. For example, 94 percent of the smallest sellers on eBay engage in exports, while 99 percent of the largest eBay sellers engage in exports. By contrast, just over 10 percent of offline small businesses examined in the study engage in exports.

The Information Technology Agreement

The Information Technology Agreement (ITA) is one of the most successful sectoral trade initiatives and played a key role in dismantling barriers to trade in IT products. The initial agreement was signed by 29 WTO members (counting the EU-15 countries individually) at the Singapore Ministerial Conference in December 1996. The ITA committed participating countries to eliminate customs duties and tariffs, and bind them at zero by January 2000, on the following product categories:

- Computers
- Semiconductors
- Semiconductors manufacturing equipment

22 "IT products" refer to products covered by the Information Technology Agreement. IT products that are grouped together with other non-IT products in tariff and trade classifications are excluded.

- Telecom apparatus
- Instruments and apparatus
- Data storage and media software
- Parts and accessories

At its inception, the ITA covered about 80 percent of world trade in IT products.[23] The agreement now includes 74 countries, accounting for approximately 97 percent of world trade in IT products (see table 4.1).

Table 4.2 lists the top 20 exporters and importers of IT products in 2010. The majority of trade in IT products is conducted by members of the ITA. Almost all the top exporters belong to the ITA and they sell 96.5 percent of world IT exports. Seventeen of the top 20 importers are ITA members and they buy 88.4 percent of world IT imports. However, some major IT trading countries are non-ITA members, namely Brazil, Mexico and Russia. In 2010 Mexico exported $38 billion worth of IT products, roughly 3 percent of world IT exports. The same year, Brazil, Russia and Mexico imported almost $90 billion in IT products, or 6 percent of world imports of IT products. Mexico's average bound tariff rate on IT products is 35 percent,[24] while Brazil's is 32 percent. Including these economies in the agreement could potentially provide a significant boost to IT trade.

Expanding Trade in IT Products

The main obstacles to expanding international trade in IT products relate to limits on the product coverage of the ITA and the exclusion of non-tariff barriers (NTBs) from the agreement.

IT products are enumerated in two "attachments." Attachment A lists 154 HS sub-headings covered under the ITA, while Attachment B lists specific products that are covered but do not necessarily correspond to a specific HS code. The purpose of listing products in terms of their functionality rather than by HS code is to allow new products to be covered by the ITA, regardless of where they are placed in a country's tariff schedule (Hufbauer, Schott and Wong 2010). However, ITA members disagree on the classification of certain Attachment B products and technological advances have rendered the ITA list somewhat out of date.[25] For example, the agreement excludes electronic consumer goods such as televisions, CDs and DVDs.

Advances in technology mean that many consumer goods are now multifunctional and can be categorized as both consumer and IT products. Additionally, while the HS classification system has been revised three times (in 2002, 2007 and 2012) to reflect changes in global trade, the ITA product classification and coverage has not been updated. For example, many 2007 HS subheadings

23 The text of the ITA stipulates that participants representing roughly 90 percent of world trade in IT products must notify their acceptance of the ITA in order for the agreement to come into force. The 90 percent threshold, or "critical mass", was meant to minimize the free-rider problem associated with applying zero tariffs on an unconditional MFN basis.

24 Note that Mexico's higher tariff on IT products does not apply to imports from its numerous FTA partners, including the United States,Canada,Japan and the European Union.

25 13 products are listed as "in" Attachment B, while 42 products listed in Attachment A are identified as being "for" Attachment B.

combine ITA products with non-ITA products, creating discrepancies between the HS 2007 and ITA tariff subheadings (Dreyer and Hindley 2008).

Provisions to dismantle NTBs were excluded from the ITA due to an impasse between the United States and the European Union. While the EU favored the inclusion of NTBs in the agreement, the United States advocated a more targeted agreement that would focus only on eliminating tariffs (WTO 2012). The ITA Committee identified the main NTBs affecting IT trade, including:

- Conformity assessment, testing and certification procedures
- Standards and regulatory environment
- Customs procedures and certificates of origin
- Import licensing
- Rules of origin
- Transparency and availability of information
- Government procurement
- Restrictions on IT professionals.

Although no explicit obligations on NTBs were included in the ITA, the agreement includes a provision to review NTBs and product coverage. The ITA Declaration mandates its participants to:

> Meet periodically [...] to review the product coverage specified in the Attachments, with a view to agreeing, by consensus, whether in the light of technological developments, experience in applying the tariff concessions, or changes to the HS nomenclature, the Attachments should be modified to incorporate additional products, and to consult on non-tariff barriers to trade in information technology products.[26]

However, any amendment to the agreement requires consensus by all ITA members, and the agreement does not set a deadline for reaching consensus. Not long after the ITA was implemented, however, ITA members began negotiating an expansion of the ITA product coverage. In 1998, the so-called ITA II negotiations tabled a list of products that might come under the ITA umbrella, but the proposal was never formally adopted.

More recently there has been a renewed push to re-launch negotiations to expand the ITA. In November 2011, the APEC countries agreed to take a "leadership role in launching negotiations to expand the product coverage and membership" of the ITA.[27] In May 2012, a group of ITA members circulated a concept paper for the expansion of the ITA, calling on ITA members to launch negotiations to "expand the product coverage of the ITA and seek to include non-signatory

26 World Trade Organization, "Ministerial Declaration on Trade in Information Technology Products," http://www.wto.org/english/docs_e/legal_e/itadec_e.htm (accessed October 9, 2012).

27 APEC, "The Honolulu Declaration: Toward a Seamless Regional Economy," http://www.apec.org/Meeting-Papers/Leaders-Declarations/2011/2011_aelm.aspx (accessed October 9, 2012).

IT producers in the ITA."[28] A core group of 18 ITA members recently made headway towards consolidating a revised list of products through a series of informal bilateral and plurilateral talks. In late 2012, the proposed product list consisted of 350 tariff lines, but members are trimming the list to a target of between 200 and 250 new lines in an effort to ensure consensus among all members.[29] While an expansion of product coverage is probable, an expanded ITA will, at best, entail limited coverage of NTBs.

To preview our recommendations, given the key role IT plays in driving global growth, WTO members should commit: (1) to expand product and country coverage of the ITA; and (2) to make the WTO "standstill" agreement on barriers to trade in e-commerce permanent.

Value of the ITA

Empirical work shows the value of ITA membership. Bora and Liu (2006) used a gravity model to analyze the trade creation effects of ITA membership. Their results indicate that a non-ITA member would import 14 percent more from a WTO member if it were to join the ITA.

Lee-Makiyama (2011) proposed the creation of an International Digital Economy Agreement (IDEA), in a study by the European Center for International Political Economy (ECIPE). The IDEA would expand product coverage and membership of the current ITA. The IDEA would seek to:

- Expand ITA product coverage: include all IT products that register, store, communicate or render information, and all products that use digital technology.[30]
- Expand membership to include Argentina, Brazil, Chile, Mexico, Russia and South Africa.
- Include computer related services and telecommunication services.
- Replace economic needs tests (ENTs)[31] and liberalize intra-corporate transfers and quotas on temporary movement of workers (mode 4).

28 WTO, "Concept Paper for the Expansion of the ITA," G/IT/W/36, May 2012. Available at http://wto.org (accessed on October 9, 2012).

29 With the list now standing at 300 tariff lines, the core group has committed to eliminating 60 to 80 tariff lines from the list by March 2013, and some are optimistic that negotiations could near an end by mid-summer of 2013. Others expect a resolution in the Bali WTO ministerial in December 2013. See "ITA Expansion Proponents Aggressively Cut Back Proposed Product List," *Inside US Trade,* January 25, 2013, www.insidetrade.com (accessed on January 25, 2013).

30 The tariff line commitments under the expanded product coverage would follow a negative list approach by category at the 4 digit HS level instead of a positive list approach on a product-by-product basis. The expanded product coverage follows the proposal by a group of six WTO members in May 2012, and includes products capable of processing digital signals and products that can send or receive digital signals without lines. For more details see "Concept Paper for the Expansion of the ITA," May 2012 (G/IT/W/36), available at http://wto.org.

31 Economic needs tests, also known as "labor market tests", are defined by the WTO as "a test that conditions market access upon the fulfillment of certain economic criteria." They are included in mode 4 commitments often without indicating the criteria of their application, and have been identified as a barrier to market access under Article XVI of the General Agreement on Trade in Services (GATS). For more detail see WTO Trade Topics, Services, "Movement of Natural Persons," available at http://wto.org.

Trade Gains from Expanded Coverage

Lee-Makiyama (2011) finds that expanded product coverage among current ITA members would add just over $200 billion in ITA imports, or roughly 17 percent of current ITA imports. Including the six non-ITA countries to the agreement would boost imports by $45 billion, or 3 percent of current ITA imports. The addition of computer and telecommunication services would cover another $130 billion in imports, or 10 percent of current imports.

Table 4.3 indicates country-specific trade gains. Expanded product coverage would boost exports of the five large ITA exporting countries by $100 billion, or 16.5 percent of their current ITA exports. Imports would increase by $98 billion, about 14 percent of their current imports. Expanding the agreement to include an additional six major countries would increase existing ITA country exports by $49 billion and imports by $26 billion. Including computer services and telecommunications would give the biggest boost to the European Union and India: their exports would increase by $35 billion and $49 billion respectively. Among non-ITA members, Mexico would experience the largest increase in export coverage (mainly from expanded product coverage), while Mexico, Brazil and Russia would see a notable boost in import product coverage.

While the payoffs from the IDEA would be significant, that agreement is ambitious. If the IDEA is concluded, very likely it would not cover all the provisions outlined here. But even if the IDEA succeeded only in terms of expanded product coverage, Lee-Makiyama (2011) estimates it would enlarge IT trade by over $200 billion.

Thelle, Sunesen and Jensen (2010) reach similar results. The authors use a partial equilibrium model to assess the impact of eliminating tariffs on a defined list of IT products.[32] Their results show that, with expanded product coverage, ITA members could potentially export an additional $320 billion in IT products. Adding the six major non-ITA countries to the agreement would boost IT exports by another $4 billion.

Hufbauer, Schott and Wong (2010) examine the payoffs from a sector initiative based on an expansion of ITA membership and a sector initiative on electronic and electrical goods. Their ITA sector initiative assumes that all 22 large countries in the sample eliminate tariffs on ITA products under the existing ITA schedule. Their sector initiative on electronics and electrical goods covers the majority of ITA products plus new electronics and electrical goods as outlined in the 2008 WTO NAMA modalities; these cover roughly 50 percent more world trade than the ITA. The authors consider trade gains for a sample of 22 large countries. The total exports of ITA products among the 22 sample countries could potentially increase by $22 billion, while imports from the world could increase by almost $23 billion. Gains under the sector initiative on electronics and electrical goods would be even larger: $34 billion in export gains and $35 billion in imports. Together these sector initiatives could boost exports among the 22 countries by $56 billion and imports from the world by nearly $60 billion. In both sector initiatives, the majority of gains go to existing ITA members. Some non-ITA members like Brazil would experience significant import gains – around $3 billion under the ITA initiative and $4 billion under the electronics and electrical goods initiative.

32 For a complete list of the expanded IT products, see p. 51 in Thelle, Sunesen and Jensen (2010).

Jobs Supported by IDEA

Table 4.4 outlines the potential jobs supported from the IDEA proposal based on the estimated increase in exports from product coverage and ITA membership expansion. Jobs coefficients are derived from employees per billion US dollars of GDP in tradable sectors of the economy (based on value added in industry) for current ITA countries and six non-ITA countries. Applying these jobs coefficients to the export gains from the IDEA proposal, global jobs supported would increase by 3.7 million. Current ITA members would see the largest gains in jobs supported, China would be the big winner, adding 2.8 million jobs in the IT sector from expanded product and country coverage. The European Union and India would reap fewer but still significant gains, adding roughly 200,000 and 180,000 jobs to their IT sectors respectively. The United States would see an increase of approximately 140,000 jobs, with 55,000 jobs due to product expansion. A study conducted by the Information Technology & Innovation Foundation (ITIF) finds similar numbers. The study estimates that expansion of ITA product coverage would lead to approximately 60,000 jobs in the United States.[33]

The non-ITA members or candidate countries would add roughly 285,000 jobs by joining the IDEA. However, nearly 90 percent of these gains would go to Mexico, while countries like Brazil would add less than 20,000 jobs through the IDEA initiative.

GDP Increases

The potential trade expansion from the IDEA proposal also leads directly to GDP gains. Table 4.5 translates the estimated export gains from product coverage and membership expansion into GDP increases for ITA and non-ITA countries. Again we refer to the methodology explained in Appendix A. To calculate the GDP increase resulting from additional exports, we use the average dollar ratio from table A.3, namely 0.46. Since dollar ratios are based on two-way trade, we calculate the sum of exports and imports from product and membership expansion, using the data from table 4.3. For ITA countries, the estimated two-way trade increase of $273 billion translates into collective GDP increases of $126 billion. Among ITA countries, the United States and China enjoy the largest GDP increases, with gains of $43 billion and $40 billion, respectively. For the six non-ITA members, the gains are more modest – the estimated two-way trade increase of $46 billion translates into collective GDP increases of $21 billion. Overall, the IDEA proposal would deliver world GDP increases of roughly $147 billion.

Standstill Agreement on E-commerce

In 1998, WTO members reached a "standstill" whereby they agreed not to impose customs duties on electronic transactions. The agreement has been repeatedly extended, most recently in December 2011, when it was renewed until the next WTO ministerial in December 2013. Quantifying the trade gains from not imposing tariffs on E-commerce is difficult and little work has been done on this subject. A study conducted more than a decade ago by the United Nations Conference on Trade and Development (UNCTAD 2000) evaluates the impact of E-commerce on the global economy.

33 Stephen Ezell, "The Information Technology Agreement: Advice and Information on the Proposed Expansion: Part 2," The Information and Technology and Innovation Foundation, November 8, 2012, www.itif.org (accessed on December 10, 2012) Oral testimony to the United States International Trade Commission.

The authors examined two categories of E-commerce: first, products that can be transmitted electronically (e.g., downloading a piece of computer software); and second, goods and services that can be bought and sold electronically but that are delivered by conventional means (e.g., a book from Amazon). Using a computable general equilibrium model the authors analyze the effects on the global economy before and after the presence of E-commerce. Their results show an average boost to GDP of 0.5 percent and an average increase in exports of 0.6 percent.[34]

Brookes and Wahhaj (2000) calculate similar results in their estimates of the effect of E-commerce on real GDP. Their analysis, which includes data on five countries, shows that GDP in these countries could grow roughly 0.25 percentage points faster each year. Over the long-run, total GDP gains would be 5 percent. Half of this growth would take place in the first decade. Of the five countries surveyed, Japan would experience the largest long-run increase in GDP (5.8 percent), followed by Germany (5.7 percent), France and the United Kingdom (both 5.3 percent), and the United States (4.4 percent).

Box 4.1 summarizes the work of Mattoo, Perez-Esteve and Schuknecht (2001), who examine the impact of tariff revenues on software and "digitisable" media.[35] They find that the weighted average tariff currently applied to software and digitisable media is relatively low, and that for 29 selected countries, the estimated tariff revenue loss from moving trade online would be minimal – just 0.80 percent of total tariff revenue and 0.03 percent of total fiscal revenue. However, electronic commerce and internet activity have increased dramatically since the study was published. A report by Weller and Woodcock of the OECD (2012) reports that the volume of online activity has grown on average 50 percent a year since 2006, and that today just twenty households with average broadband usage generate as much online traffic as the entire internet carried in 1995. Consequently, the revenue impact of putting tariffs on E-commerce today could be substantially larger than in 2000.

Rather than attempt to estimate the consequences for trade, customs revenue, jobs and GDP of imposing customs duties on E-commerce, we conclude that the impact would be significant. A considerable volume of trade would disappear, simply from the "hassle factor" of collecting customs duties. The impact on trade and GDP would be large and adverse. At the same time, some governments would collect a substantial amount of tariff revenue.

34 The authors assume that the impact of e-commerce is not identical across regions, but instead equal to 1 percent for developed countries and 0.3 percent for all other regions. For a more detailed discussion of the methodology see pp. 26-30 in UNCTAD (2000).

35 "Digitisable" media refers to software and media products that are traditionally delivered as physical goods, but can now be delivered electronically.

5. DUTY-FREE QUOTA-FREE MARKET ACCESS

Introduction

The role of trade in supporting growth and reducing poverty among least developed countries (LDCs) is widely acknowledged. "Early harvest" proposals for the Doha Round include several components of interest to LDCs: bolstering service exports; improving duty-free quota-free (DFQF) market access; and resolving disputes over cotton subsidies (see UNCTAD 2011a). Among these, DFQF is an achievable objective in the near-term.

Despite significant progress through unilateral trade preference programs, many developed countries have yet to implement LDC market access for all tariff lines, mostly for reasons drawn from the textbook of political economy. But overwhelming obstacles do not prevent large players from subscribing to DFQF and narrowing the number of product exclusions. Empirical studies show that developed countries and advanced developing countries alike can provide full DFQF market access with minimal adverse impacts on domestic production and with sizable potential payoffs for LDCs.

Negotiating Background

At the 6th WTO Ministerial Conference in 2005, WTO members committed to DFQF market access for all products originating from LDCs. However, this obligation was limited by permitting developed countries "facing difficulties at this time" to subscribe to DFQF at a threshold of 97 percent of tariff lines, with the aim to incrementally broaden coverage to 100 percent of tariff lines.[36] Developing countries "declaring themselves in a position to do so" were also permitted to flexibly phase in DFQF schemes. WTO members agreed to additional measures to facilitate LDC exports, including simplified and transparent rules of origin. These commitments built off a United Nations resolution, dating from 2000, which called for increasing the "proportion of total developed country imports from developing countries and least developed countries, admitted free of duty" to help achieve the Millennium Development Goals.[37] Table 5.1 lists the 48 least developed countries, as designated by the United Nations.[38]

Stimulating two-way trade and inward investment has long been viewed a critical means to drive development in LDCs. While trade in goods and services accounts for 62 percent of LDCs total GDP, these countries only account for one percent of global trade. Yet, the recent food and financial crises severely impacted LDCs – after 2009, an additional 9.5 million people fell into extreme poverty and LDC export revenue dropped by 24 to 32 percent depending on the country (UNCTAD 2011a). Although LDC exports rebounded nearly 24 percent by 2011 (due in part to higher commodity prices), GDP per capita in the LDCs remains stagnant relative to other developing countries.[39] These circumstances have reinforced DFQF as a key component of the "trade stimulus" to boost the lagging growth of poor countries and accelerate their integration into the global economy.

36 World Trade Organization, "Ministerial Declaration, Annex F, Decision 36," (WT/MIN(05)/DEC), www.wto.org (accessed on December 10, 2012).

37 Specifically, DFQF was intended to achieve MDG goal eight, "Global Partnership for Development," See UN MDGS, http://iif.un.org/content/global-partnership-development

38 According to the United Nations, low per capita income, human asset development and economic vulnerability form the criteria for qualification as an LDC.

39 For more detail on LDC economic development see UNCTAD (2011b).

Progress toward DFQF Market Access

Although DFQF market access was initially part of the "single undertaking" that underpinned the launch of the Doha Development Round, many countries have since made important progress through unilateral and non-reciprocal trade preference programs. Table 5.2 summarizes the DFQF schemes of preference-giving countries in the OECD. Through the Everything But Arms (EBA) program, the European Union has already opened markets for 100 percent of LDC exports (with the exception of armaments). In addition, Australia, New Zealand, and Norway provide access for 100 percent of tariff lines. Japan and Canada provide access for over 98 percent of tariff lines, with some exceptions for agricultural products. Canada importantly liberalized its rules of origin for apparel. The United States provides access for 82 percent of LDC export tariff lines, and more for sub-Saharan Africa and Haiti. Through the Generalized System of Preferences (GSP) the United States provides up to 98 percent through the US African Growth and Opportunity Act (AGOA) and 91 percent through parallel legislation for Haiti.[40]

Key advanced developing countries have also subscribed to DFQF market access, reflecting their growing importance as export destinations for LDCs. India is working toward 85 percent product coverage by 2012, while China's scheme covers 60 percent of LDC exports and will extend to 97 percent over the next few years. In 2010, Brazil began a program offering 80 percent coverage and aims to expand to 100 percent. These programs, however, entail significant product exclusions and in some cases, do not yet apply to all LDCs.[41] Yet they represent the growing commitment of advanced developing countries to open markets to the world's poorest countries.

The full scope of potential trade gains from DFQF has not yet been realized: the United Nations Conference on Trade and Development (UNCTAD) estimates that as few as 50 percent of LDC exports now enter markets duty-free and quota-free. An important reason is that many trade preference programs exclude products in which LDCs enjoy a comparative advantage: select agricultural goods (sugar, rice, meat, dairy, etc.) and labor-intensive manufactures (textiles and apparel, footwear, etc.). Moreover, LDC exports are highly concentrated in a narrow range of goods (see table 5.3), covered by a cluster of tariff lines. Some estimates suggest that 25 tariff lines at the HS six-digit level cover nearly 85 percent of LDC exports. Laborde (2008) calculates that, for most developed countries, just 3 percent of HS six-digit tariff lines cover between 90 and 98 percent of their imports from LDCs. His calculations suggest that the 3 percent of tariff lines remaining outside the 97 percent threshold cover a significant portion of potential LDC exports.

Even preference programs offering 100 percent product coverage, such as the EU's EBA program, often include restrictive or inflexible rules of origin for determining product eligibility. Rules of origin are designed to ensure that "substantial transformation" of inputs occurs in the exporting LDC; these rules are often complex and, in practice, are difficult for LDC exporters to meet (Elliott 2009). Some estimates suggest that, on average, rules of origin could constitute a tariff equivalent of 3 to 4 percent. Elliott (2009) reports that, in the case of apparel and other product-specific rules facing LDCs, the tariff equivalent could be as high as 15 to 20 percent. For open market access to have an impact, simplified rules of origin should be pursued concurrently. "Extended cumulation"

40 AGOA covers 34 LDCs in sub-Saharan Africa and the HOPE Act expanded preferences under the Caribbean Basin Initiative for Haiti. However, these programs provide only duty-free access, not quota-free market access.

41 Products excluded include cotton, sugar, and fruit in China; some agricultural products and textiles in India; and textiles and apparel in Brazil. For more detail see Elliot (2009), pp. 15.

for example, has been suggested as a possible reform that would encourage exports from LDCs.[42] Canada in particular has improved its preferential rules of origin for apparel.[43]

These are just a few of the factors that have lowered the effectiveness of trade preference programs for LDCs. A report by the Center for Global Development (2010) summarizes other important issues and identifies five recommendations for improving programs. These include:

- Expand DFQF coverage to all LDC exports.
- Reform program rules that impede market access, including rules of origin that restrict input sourcing.
- Make programs permanent to increase stability and predictability and thereby encourage supply relationships and investment in LDC export sectors.[44]
- Encourage "high-impact" preference programs in advanced developing countries.[45]
- Develop mechanisms for dialogue and cooperation with LDCs to address other issues, such as supply-side challenges, that also create obstacles to preference utilization.

While each of these recommendations might eventually be achieved, we focus on two that WTO members can implement in the near-term: (1) commit to fewer product exclusions and even expand to 100 percent product coverage; (2) ensure that rules of origin do not obstruct market access.

Political Obstacles to DFQF

Two major obstacles hinder improved DFQF market access. First, preference-giving countries are worried that unrestricted exports will adversely impact their own producers. Concerns over market disruption are prominent for certain heavily protected agricultural items in the United States and Canada. Second, developing countries and even some LDCs fear that expanding preferences for LDCs through DFQF will undermine existing preferences and negatively impact their exports. For example, exporters in sub-Sahara Africa that currently benefit from the US AGOA program fear that preference erosion will occur in the US market for textiles and apparel if Asian LDCs gain preferential market access.[46]

42 "Extended cumulation" allows LDCs (or any preference beneficiary) to source inputs from a designated set of countries and still have those items recognized as originating from the LDC (CGD 2010, p.11). This allows cumulation from other developing countries that are beneficiaries of a preference program such as GSP or that are part of the importing country's FTA network.

43 Besides the United States, Canada is the only country with modified rules of origin for apparel. Though Canada requires that 40 percent of clothing be locally produced to be eligible for DFQF, LDCs can cumulate inputs from any beneficiary of Canada's GSP program. Canada has also lowered the value-added threshold for LDCs. In the case of the United States, LDCs in the AGOA program are exempt from the triple transformation rules that otherwise apply to apparel.

44 Two aspects increase risk and uncertainty for importers and investors: many preference programs are not permanent and must be frequently renewed; and eligibility conditions are often numerous, not transparent, or arbitrarily applied. See CGD (2010), pp. 12.

45 Advanced developing countries have the potential to enhance the impact of DFQF initiatives, but in order to become "high-impact," their programs must implement the recommendations that apply to developed country programs: full product coverage, flexible rules of origin, and program stability and predictability. See CGD (2010), pp. 14.

46 African LDCs have been highly vocal for many years in resisting the expansion of preferences in the United States. See "Proposal To Unify Preferences Programs Faces Strong African Opposition" *Inside U.S. Trade,* December, 18, 2009, www.insidetrade.com (accessed on December 3, 2012).

Trade Gains

Research shows that even a limited number of product exclusions can render DFQF market access "commercially meaningless." By contrast, reducing the number of exclusions can promote LDC exports and thereby jobs supported. To evaluate these potential payoffs, we consider the estimated trade gains in Bouët et al. (2010) and Laborde (2008). While both studies simulate multiple scenarios, for the purposes of this Policy Brief, we focus on two: (1) moving from 97 percent to 100 percent DFQF market access in the OECD only; (2) moving from 97 percent to 100 percent DFQF market access in the OECD and select emerging country markets (Brazil, India, and China). Laborde's (2008) analysis offers the best case scenario of expanded market access if DFQF is embraced by OECD countries and emerging markets. The modeling by Bouët et al. (2010) underscores the importance of 100 percent rather than 97 percent tariff line coverage.

Bouët et al. (2010) use their Modeling International Relationships in Applied General Equilibrium (MIRAGE) computable general equilibrium (CGE) model to estimate the long-term impact in the year 2020 from expanding DFQF market access in 2010. The analysis aggregates data into 36 countries or regions and 28 sectors comprised of LDC exports.[47] The authors find, in the baseline case of 97 percent product coverage, that no LDC gains even as much as 0.10 percent in additional exports. They conclude that excluding 3 percent of tariff lines basically reduces DFQF benefits to zero.

Table 5.4 presents the percent change in exports and GDP expected in 2020 from implementing 100 percent DFQF market access by the OECD importers. Among LDCs, Malawi reaps the highest gains with exports increasing by 12.9 percent, followed by Bangladesh and Cambodia with export gains of 4.2 percent and 2.5 percent respectively.[48] Developing countries that could potentially suffer export losses from preference erosion, such as Mauritius, South Africa and Central America, instead show small, positive export gains. For other developing countries, any resulting export loss is less than 0.01 percent of total exports.

Potential trade gains are markedly higher when emerging markets (Brazil, China, and India) also expand DFQF market access to 100 percent of tariff lines. In this scenario, the losses suffered by Madagascar disappear and all LDCs report higher export gains. Malawi, Senegal, and Bangladesh would reap the largest gains with 13.9 percent, 9.4 percent and 4.8 percent additional exports respectively. Further, the results suggest that while Asian LDCs would reap large potential gains primarily due to new access to the US market, African LDC exporters would not suffer sustained export losses.[49]

Bouët et al. (2010) conclude that the overall impact of full DFQF market access on preference-giving countries is small, since the estimated effects on exports and domestic production are nearly indistinguishable from zero. Table 5.5 shows the effect of moving to 100 percent DFQF access on the production of select agricultural goods in preference-giving countries, including the United States,

47 Many LDCs suffer from low-quality data. These countries were included on a weighted basis in larger regional aggregates. For a more detailed explanation on data and methodology see Bouët et al. (2010), pp. 2-3.

48 Higher percentage gains relative to other LDCs are attributed primarily to increased exports in the US market for tobacco in the case of Malawi, which currently faces tariff peaks of 350 percent, and for apparel in the case of Bangladesh.

49 These results may be affected by a lack of data since disaggregated data is only available for Madagascar, one of five major LDC African apparel exporters, whereas other African LDCs are included in regional aggregates. Other studies with more disaggregated results do find modest reductions in African apparel exports to the United States, but these losses are generally in the range of 1 to 1.5 percent of current exports, see Bouët et al (2010), pp. 10.

Canada and Japan.[50] Most sectors see production declines of less than 0.10 percent. Even the highest production losses in sugar for Japan and in textiles for the United States are less than 0.50 percent of total production volume.[51] This evidence suggests that concerns in preference-giving countries over the market disruption that could occur from removing exclusions for sensitive products may be exaggerated.

The Bouët et al. (2010) CGE model yields conservative estimates that probably underestimate the potential range of trade gains from a DFQF initiative. For this reason we draw on the export gains from Laborde (2008) for the calculations in this Policy Brief. Laborde (2008) uses a partial equilibrium (PE) analysis to assess the effects of expanding DFQF from 97 percent to 100 percent of tariff lines in OECD and emerging markets.[52] The analysis simulates these scenarios from the July 2008 failed Doha package, and thus covers only the 32 LDCs that are WTO members and selected markets in which DFQF is expected to have a substantive impact.[53]

Table 5.6 contrasts the findings of the CGE and PE models. Like Bouet et al. (2010), Laborde (2008) finds that 97 percent DFQF market access produces negligible export gains. Conversely, expanding to 100 percent coverage in OECD countries could boost LDC exports collectively by $2.1 billion, or by 17 percent. If emerging markets also provide 100 percent DFQF market access, LDC exports could increase by $7.7 billion, or by 44 percent. In noteworthy cases, exports could increase by 128 percent, 65 percent, and 39 percent in Mozambique, Senegal, and Bangladesh respectively, compared to 9 percent or less in the CGE model. Laborde (2008) concludes that a DFQF market access initiative as part of a WTO agreement would be "practically worthless" unless all LDC exports are covered.

It is worth noting that these estimated trade gains are based on the assumption that full preference utilization occurs, and that the benefits are not reduced on account of restrictive rules of origin or other administrative obstacles that block market access. As a result, the potential gains from DFQF reported here could be overestimated.[54] However, we conclude that DFQF gains could be significant,

50 While sharp increases in LDC imports like sugar and apparel seem likely to occur in preference-giving countries, large import surges are less likely for meat and dairy, since LDCs would have difficulty meeting developed country SPS and food safety standards. For more detail on changes in production by sector for both developed and developing preference-giving countries see Bouët et al. (2010), table 5.

51 The authors explain that the limited impact on US production of textiles and apparel can be generally attributed to two factors: the increase in imports expected from Asian LDCs would be offset by small decreases in exports among other exporters; and LDCs do not tend to compete with the technologically advanced and capital-intensive product lines of US producers, pp. 18.

52 The partial equilibrium model generates less conservative estimates than the CGE model. One reason is that the partial equilibrium model takes into account only potential changes in demand for LDC products in the liberalizing countries once barriers to trade are removed, and not potential supply constraints in the exporting LDCs. See Bouët et al. (2010), pp. 8. Another reason is that the partial equilibrium model does not consider the reaction of competing suppliers.

53 The Doha results cited here are based off the last draft of modalities from July 2008 and three versions of the accord are considered: one without a DFQF initiative; one with 97 percent product coverage; and one with 100 percent product coverage. Selected markets include Canada, Japan, Norway, Switzerland, the United States, and the emerging markets of Brazil, China, India, Korea and Mexico. The European Union is not included as it already provided 100 percent DFQF market access.

54 For more detail on trade costs and suggested rules of origin reforms for OECD countries, see Cadot and Melot (2007). See Elliott (2009) for a substantive overview of the impact of different rules of origin in country preference programs. The author observes that most empirical analyses find limited effects of the EU's EBA program and stronger effects for Canada's program and the US AGOA program on LDC apparel exports due to modified rules of origin. Also see Portugal-Perez (2007) for more detail on the effect of rules of origin on African exports to the United States and European Union.

but that a considerable volume of LDC exports will continue to be blocked if preference-giving countries do not expand DFQF market access and, at the same time, reform their rules of origin.

Jobs Supported

Table 5.7 translates the export gains from Laborde (2008) in the best case scenario, namely $7.7 billion additional LDC exports, into jobs supported in LDCs, following the methodology explained in Appendix A. Jobs coefficients are derived from employees per billion US dollars of GDP in tradable sectors of the economy (based on value added in industry) for developing countries by region. Applying these jobs coefficients to the export gains from 100 percent DFQF market access, LDCs would collectively see jobs expand by roughly 746,000. While the distribution of job gains would vary widely, Nepal and Bangladesh together would see the lion's share, with possibly 485,000 and 153,000 additional export jobs respectively. In relative terms, countries like Cambodia, Malawi, and Tanzania would see more modest gains of 28,000, 13,000 and 11,000 additional export jobs respectively.

GDP Increases

The payoffs from expanding DFQF extend beyond trade gains and jobs supported to include, as well, higher GDP. Again we refer to the methodology explained in Appendix A. To calculate the GDP increase in LDCs resulting from $7.7 billion of additional exports, we use the average dollar ratio from table A.3, namely 0.46. Since dollar ratios are based on two-way trade we double the calculated exports. Consequently, we estimate that the two-way trade gains of $15.4 billion delivered by expanding DFQF to 100 percent of tariff lines could translate to collective GDP increases for LDCs of approximately $7.1 billion.

DFQF Market Access Agreement

Support for an "LDC-only" package has been building among major trading players, including the European Union, China, India and Brazil. In 2009, the European Union circulated a proposal during the G-20 Summit in Pittsburgh, calling for all countries to adopt the 100 percent coverage offered in the EBA program, though notably absent was a commitment to rules of origin reform. More recently, in July 2011, the G-7 countries met with WTO Director-General Pascal Lamy to negotiate a set of deliverables for LDCs, including DFQF market access and rules of origin proposals, in time for the 8th WTO Ministerial held in December 2011. However, the plan ended in stalemate due to disagreements over certain LDC "plus" provisions, as well as due to different levels of commitment from WTO members. The United States in particular, stated that the US Congress would not accept an "unbalanced package" offering only concessions to LDCs.[55]

Following the 8th WTO Ministerial, important progress was made favoring LDCs when WTO members agreed to adopt a waiver that permits preferential treatment to services exports of the 31 LDCs that are currently WTO members. In July 2012, members adopted new accession guidelines for LDCs seeking to join the WTO. A deal that sets guidelines for DFQF market access is a next plausible step.

55 For more detail see "WTO Members Call Off December Doha+ Package Amidst Stalemate," *Inside U.S. Trade*, July 28, 2011, www.insidetrade.com (accessed on November 20, 2012).

As Director-General Lamy stated during an address at UNCTAD, a goal of the WTO is to use trade "as a conduit to achieve development that is both sustained and sustainable" and find "realistic, short-term concrete steps [...] to bolster trade-led growth and development."[56] Expanding DFQF market access along the guidelines suggested in this Policy Brief can help achieve this goal at low-cost to preference-giving countries and with measurable benefits for LDCs.

56 "Lamy: Helping developing countries remains priority but 'nature of trade is changing'" WTO Speeches, September 25, 2011, www.wto.org (accessed on November 20, 2012).

6. AGRICULTURAL EXPORT SUBSIDIES

Introduction

The trade distorting effects of domestic support for agricultural production and exports are well researched. Export subsidies can result in over-production, dumping of surplus production on world markets, and depressed world prices. Box 6.1 summarizes export subsidy practices that are most common in agricultural trade. A paper circulated by the Cairns Group to the WTO Committee on Agriculture, identified export subsidies "as the most trade-distorting agricultural policies" that destabilize and depress international market prices, harm local production in food-importing countries, and undermine environmentally sustainable production methods (WTO 2000). In addition, export subsidies negatively affect the export competitiveness of non-subsidizing countries, particularly developing one, who cannot afford the additional outlays.

Multilateral Negotiations

Agricultural trade was first addressed multilaterally during the Uruguay Round in 1995. The Agreement on Agriculture committed WTO members to reduce the trade distorting effects of agricultural export subsidies and other forms of domestic support. More specifically, countries agreed to reduce export subsidies in two ways: (1) reduce the value of export subsidies; and (2) reduce the quantity of exports that receive subsidies. For developed countries this meant cutting subsidies by 36 percent and reducing the quantity of subsidized exports by 21 percent over a six-year period. Developing countries were given more leeway: they were required to cut the value of subsidies by 24 percent and reduce the quantity of subsidized exports by 14 percent over ten years.[57]

While the Uruguay Agreement on Agriculture was a step in the right direction, it was not successful in substantially reducing and binding agricultural export subsidies. Unlike non-agricultural goods, exports subsidies are permitted in agricultural trade. WTO countries that made commitments to reduce their export subsidies – twenty-five in total – are allowed to subsidize exports provided they subsidize only those products for which they made a commitment. Countries that made no commitments are not permitted to subsidize agricultural exports.[58]

Table 6.1 outlines the commitments made by WTO members and the use of export subsidies from 1995 to 2000. In terms of the range of commitments, developing countries agreed to the largest cuts to their export subsidy programs, while developed countries like Australia, Canada, and to some extent, the United States agreed to far fewer cuts. However, in terms of the value of commitments, developed countries made the largest contribution. Australia, Canada, the European Union, New Zealand, Switzerland and the United States alone accounted for 80 percent of total commitments. The use of agricultural export subsidies declined, on average, by 13 percent. However, the actual use of subsidies during that period fluctuated markedly, with some countries actually increasing, on average, their use of export subsidies.

Two remarkable achievements were made in the Uruguay Round Agreement: recognition that multilateral trade negotiations must address agricultural trade policy and the creation of a framework

57 The base period used to determine the reduction in the quantity of subsidized exports was 1986 to 1990. The implementation period for cutting the value and quantity of export subsidies began in 1995.

58 Article 9.4 of the Uruguay Agreement on Agricultural allows developing countries to subsidize certain input products.

to address barriers and market distortions in agricultural trade (Elliott 2006). The Doha Development Round, launched in 2001, set out to build on this framework. Article 13 of the Doha Ministerial declaration calls for the "reduction of, with a view to phasing out, all forms of export subsidies, and substantial reductions in trade-distorting domestic support" (WTO 2001). Draft modalities proposed the elimination of export subsidies by 2013 for developed countries and by 2016 for developing countries, but the draft did not affect commitments for least developed and net food-importing countries. To ensure faithful compliance, the draft modalities target export credits and guarantee programs, agricultural state trading enterprises and international food aid, in order to avoid "hidden" subsidies and to ensure that relevant programs and state trading enterprises operate on a commercial terms.

The main roadblock encountered during Doha negotiations on agricultural export subsidies arose from the disagreement between developed and developing countries on the permitted degree of export subsidies. Developing countries, particularly net importers, argue that their domestic producers are handicapped when import prices are depressed via export subsidies. Less developed countries opposed the rules that govern who can and cannot subsidize exports, arguing that developing countries lack the funds to compete with developed countries, and that countries that originally subsidized were unduly protected under the Uruguay Round Agreement on Agriculture.

Trade Gains

Hufbauer, Schott and Wong (2010) estimate the gains in "reciprocity terms" for a sample of 28 agricultural exporting countries from the elimination of agricultural exports subsidies by the five major subsidizers – Canada, the European Union, Norway, Switzerland and the United States.[59] "Reciprocity terms" measure gains by the revenue equivalent of concessions from cutting export subsidies.[60] To calculate concessions the authors use the average amount of subsidies notified to the WTO during the period 2000 to 2004. The authors then allocate the concessions to the 28 competing exporting countries according to each country's share in world exports of a given agricultural product.

Table 6.2 summarizes the gains in reciprocity measure terms. Total world gains amount to just $3 billion. The largest gains go to developed countries, with the United States and New Zealand gaining over $500 million respectively in reciprocity measure terms. Brazil, India and China would see combined gains of $345 million, while other developing countries would experience gains in the single digits. However, despite the low impact of reciprocity measure terms, the "lock-in" aspect is significant in the long run (Hufbauer, Schott and Wong 2010).

A 2006 study by Ralf Peters of the United Nations Conference on Trade and Development (UNCTAD) estimated the potential impact of reducing or eliminating export subsidies. The UNCTAD analysis covers 175 countries, including the 15 EU countries individually. The study uses UNCTAD's Agricultural Trade Policy Simulation Model (ATPSM) to estimate potential gains from the elimination of exports subsidies on trade revenue and welfare. The study simulates three scenarios, but for our

59 This includes the 19 of the countries that made commitments in the Uruguay Round Agreement in Agriculture, plus Argentina, China, Hong Kong, India, Malaysia, Pakistan, Philippines, Taiwan and Thailand.

60 The reciprocity measures is calculated by taking the revenue equivalent of concessions on export subsidies and multiplying that figure by relevant trade flows. For a more detailed explanation of the methodology see Appendix A in Hufbauer, Schott and Wong (2010).

purposes we examine only two: (1) a 50 percent reduction in export subsidies, including export credits; and (2) the total elimination of export subsidies and export credits. The latter scenario reflects the 2004 WTO draft modalities and the positions of key agricultural countries like the Cairns Group.

Similar to the Hufbauer, Schott and Wong (2010) analysis, UNCTAD find modest gains from the reduction of export subsidies alone. Total welfare gains are just under $2 billion, while export gains are roughly $2.4 billion (see table 6.3). The complete elimination of export subsidies would boost welfare gains by $2.5 billion and export gains by $3 billion. In terms of welfare gains, developed countries benefit the most. The elimination of export subsidies has the opposite effect on developed and developing countries in terms of consumer and producer gains: while developing countries experience positive gains in producer surplus, they are not enough to offset the negative impact to consumer surplus. With respect to export gains, the higher world prices that result from eliminating export subsidies produce positive results for both developed and developing countries: $1.9 billion additional export revenue for developed countries, $3.4 billion for developing countries (including the least developed countries). Overall, eliminating export subsidies would enhance global export revenue by around $5.3 billion. Embedded in this figure is roughly $2.5 billion for export revenue gains by members of the Cairns Group.

Jobs Supported

Table 6.4 translates this potential export revenue expansion of $5.3 billion to additional jobs supported, following the methodology explained in Appendix A.[61] Jobs coefficients are derived from employees per billion US dollars of GDP in tradable sectors of the economy (based on value added in industry) for developed and developing countries. Applying these jobs coefficients to the export revenue gains from eliminating agricultural export subsidies, developed countries might collectively see roughly 11,000 additional export jobs. Developing countries (including least developed countries) would reap larger gains collectively, possibly 131,000 additional export jobs. Combining developed and developing countries, we calculate the global trade gains of $5.3 billion delivered by eliminating agricultural export subsidies could translate to approximately 142,000 additional export jobs.

GDP Increases

The potential trade gains from eliminating agricultural export subsidies also translate to GDP increases. We refer again to the methodology explained in Appendix A. To calculate the world GDP increase resulting from $5.3 billion of additional export revenue, we use the average dollar ratio from table A.3, namely 0.46. Since dollar ratios are based on two-way trade we double the calculated export gains for developed and developing countries. Table 6.5 shows the estimated GDP increases by region. We estimate that the estimated two-way trade gains of $10.7 billion delivered by eliminating agricultural export subsidies would translate to world GDP increases of approximately $4.9 billion. Developing countries would enjoy 67 percent of these gains ($3.1 billion), while developed countries would enjoy 36 percent ($1.8 billion).

61 It should be observed that the jobs coefficients relate to real export gains. Applying the same coefficients to export revenue gains entails something of a mismatch.

Agreement on Agricultural Export Subsidies

Despite the multiple roadblocks to the Doha negotiations, WTO members did successfully secure a tentative agreement on the phase-out of agricultural exports subsidies. In 2004, the General Council adopted a framework proposal that would eliminate export subsidies on products of particular interest to developing countries, and phase-out exports subsidies on remaining products. In addition, the General Council agreed to eliminate export credits, trade-distorting practices of State trading enterprises, and food aid not in conformity with agreed disciplines. This framework was revised in 2008, outlining stricter modalities. WTO members agreed on a timeline for the phase-out of export subsidies: 2013 for developed countries and 2016 for developing countries. The revised modalities also introduced some flexibility for the use of export credits and international food aid, and simplified the definition of state trading enterprises.

As outlined in an earlier report (Hufbauer and Schott 2012), we believe WTO members should use this framework as a means to lock-in the reform of agricultural export subsidies. With the recent high world commodity prices the need for export subsidies has declined substantially. WTO members should take advantage of these conditions and lock-in these reforms for at least three years. If WTO members move quickly they could implement reforms before the European Union concludes it review of its common agricultural policy later in 2013. A realistic target date for completing an agreement is the upcoming WTO Bali Ministerial meeting in December 2013.

7. FOOD EXPORT CONTROLS

Introduction

In the realm of merchandise trade, probably no segment faces more intervention than agriculture. Governments have historically limited imports with tariffs and quotas; they have applied sanitary and phyto-sanitary (SPS) standards in a discriminatory manner; they have subsidized production and exports; and they have used state corporations to monopolize trade. Adding to this familiar array, in recent years many countries have restricted food exports as a political answer to drought and price spikes in wheat, rice and other staples. During the drought of 2006 to 2008, over 20 countries controlled their food exports. Table 7.1 outlines the type of export controls implemented by those countries during the food crisis. Table 7.2 lists the market shares of those same countries in world agricultural trade.[62] In the aggregate, these countries account for a third of world exports of agricultural commodities.

The political logic of food export controls is immediate and obvious: fight high prices and alleviate food shortages. The economic damage is longer term and less obvious. When one country stabilizes domestic food prices and enhances availability through trade controls, it "exports" rising prices and scarcity to the world market. Consumers in food importing countries thereby suffer. Over a period of time, such episodes generate strong resistance against import liberalization.[63] Agricultural self-sufficiency becomes an unspoken theme of national policy, with huge long-term costs both for the protectionist country and for the global economy.

Two World Bank economists, Hoekman and Martin (2012), calculated the contribution of food export controls to rising world rice and wheat prices in the 2006-2008 episode. By their estimates, food export controls boosted the world price of rice by 57 percent (the total price increase was 127 percent) and the world price of wheat by 33 percent (the total price increase was 114 percent). Reviewing the same period, Anderson and Nelgen (2012) concluded that changes in food trade restrictions raised the international price of rice by 45 percent (total price increase of 113 percent), the international price of wheat by 13 percent (total price increase of 70 percent) and the international price of maize (corn) by 8 percent (total price increase of 83 percent). In an earlier exercise, Bouët and Debucquet (2010) examined the impact of demand shocks and the implementation of trade restrictions on world food prices. Their results indicate that wheat is by far the most affected commodity, and that export controls have a bigger impact than plausible demand shocks.[64]

Cost of Food Export Controls

Averaging the findings of Hoekman/Martin and Anderson/Nelgen, we conclude that food export controls of the magnitude recently experienced would raise the world rice price by 51 percent, the

62 For our purposes 'agricultural goods' only include the major commodities that were targeted during the 2006-2008 crisis. This includes cereals, wheat, maize and rice.

63 In the early 1970s, President Nixon restricted soybean exports to Japan in order to dampen rising prices in the United States. Twenty years later, during the Uruguay Round, this episode was still cited by Japanese officials as an argument against liberalizing their rice and beef imports.

64 In their simulations, a demand shock can potentially increase world prices by 10.8 percent, while the imposition of export controls can boost prices to 16.8 percent. See table 6, p. 16 in Bouët and Debucquet, (2010).

world wheat price by 23 percent, and the world maize (corn) price by 8 percent. Table 7.3 translates these likely price increases into consumer costs (GDP losses) in food importing countries, assuming that – in the absence of fresh international agreements – the controls stay in force for two years.

The year 2011 serves as a baseline year for estimating the near-term consequences of food export controls. In 2011, world imports of maize, rice and wheat were 98 million metric tons (mmt), 35 mmt, and 148 mmt, respectively. Costs to importing countries of future food export controls lasting two years are estimated by multiplying the world imports of each commodity by the world price increases delivered by the 2006 – 2008 episode of controls. These calculations show that the 8 percent increase in the maize price experienced in 2006 – 2008 would cost consumers approximately $4.5 billion over two years; the 51 percent increase in the world rice price would cost consumers approximately $19.0 billion; and the 23 percent increase in the world wheat price would cost consumers $21.5 billion. In aggregate terms, the price increases in 2006 – 2008, if repeated over a two year period, would translate to a total cost of $45.5 billion for food importing countries. Based on this illustrative calculation, if food export controls are imposed only in periods of spiking prices, their cost to importing countries would be episodic, but quite significant. This underlines the need for better discipline.

Discipline on Food Export Controls

In joint declarations, both the G-20 members and the APEC countries have called on nations not to impose food export controls. The G-20 Cannes Summit Final Declaration, issued in November 2012, states that G20 members "agree to remove food export restrictions or extraordinary taxes for food purchased for non-commercial humanitarian purposes by the World Food Program and agree not to impose them in the future."[65] The language is somewhat limited in that, read narrowly, it applies only "non-commercial humanitarian" foodstuffs.

The APEC Ministerial meeting held in Vladivostok in September 2012 produced the somewhat broader Kazan Declaration on APEC Food Security. The Kazan Declaration recognizes that "bans and other restrictions on the export of food may cause price volatility, especially for economies that rely on imports of staple products." The Declaration commits APEC leaders to:[66]

- Remove restrictions and extraordinary taxes on food purchased for non-commercial humanitarian purposes.
- Strengthen food security through promoting open and transparent markets, increasing sustainable agricultural production and productivity and improving access to food for vulnerable groups of the population.

Following the food crisis of 2006 to 2008, policies to control food export restrictions were discussed with renewed attention at the World Trade Organization. In April 2008, Japan and Switzerland circulated an informal paper that proposed new measures on food export restrictions that went beyond the draft modalities of the Doha round. Their proposal would require "any new export

65 See "Cannes Summit Final Declaration," G20-G8, France 2011, available at www.g20-g8.com (accessed on October 4, 2012).

66 See "2012 Leaders Declaration," Vladivostok Declaration – Integrate to Grow, Innovate to Prosper, September 2012, available at http://www.apec.org/Meeting-Papers/Leaders-Declarations/ (accessed on October 4, 2012).

prohibition or restriction [to] to be limited to the extent strictly necessary" and would oblige countries seeking to restrict exports to give "due consideration" to the food security of importing countries (see Mitra and Josling 2009). Countries seeking to impose new export restrictions would be required to:

- Notify the WTO Committee of Agriculture prior to implementation of any new restrictions;
- Reach an agreement with net importing countries prior to the imposition of any new restriction;
- Explain how food aid for net importing developing countries would be affected.

Under the proposal, if the relevant parties are not able to reach an agreement, the planned restrictions would be referred to binding arbitration by a Standing Committee of experts.[67] Apart from the Japanese-Swiss proposal, the Doha draft modalities proposed in December 2008 would require countries to notify the WTO within 90 days of implementing new export restrictions. If restrictions are scheduled to last longer than 18 months, the implementing country would have to obtain the consent of net importers affected by the policy. In our view, the Japanese-Swiss proposal, coupled with the Doha draft modalities, together point the way toward better discipline of food export controls.

67 Access to the Japanese-Swiss proposal (WTO JOB(8)/34) is currently restricted. The details of the proposal are sourced from the following publications: Mitra and Josling (2009); Sharma (2011) and ICTSD (2008).

8. GREEN GROWTH THROUGH TRADE

Introduction

It is widely recognized that trade plays a key role in sustainable, green growth. Dismantling barriers to trade in environmental goods and services (EGS) can improve the efficient use of resources, promote competition and facilitate the transition to cleaner technologies (Meltzer 2012). Most importantly, it can help mitigate negative externalities that arise from increased economic growth, such as increased greenhouse gas (GHG) emissions and the loss of biodiversity.

The General Agreement on Tariffs and Trade (GATT), signed in 1947, touched on trade-related aspects of the environment by including two carve-outs for environmental measures. Article XX(b) and XX(g) allow WTO members to adopt certain GATT inconsistent measures if they are "necessary to protect human, animal or plant life or health" or are measures "relating to the conservation of exhaustible natural resources" (WTO 1947). During the Tokyo and Uruguay negotiating rounds (from 1973 to 1979 and 1986 to 1994, respectively) negotiators discussed the relationship between the adoption of protectionist environmental policies and unnecessary trade barriers. The Tokyo Round Agreement on Technical Barriers to Trade (TBT), the General Agreement on Trade in Services (GATS), and agreements on Sanitary and Phyto-sanitary Measures (SPS), Agriculture, and Intellectual Property Rights (TRIPS) specifically address some of these environmental concerns, by calling for "sound science" when formulating policies and implementing environmental measures (Hufbauer and Schott 2012).

The relationship between trade and environmental protection was enshrined in the WTO. The opening paragraph of the Marrakesh Agreement, establishing the WTO, identifies the need to expand:

> the production of and trade in goods and services, while [...] allowing for the optimal use of the world's resources in accordance with the objective of sustainable development, seeking both to protect and preserve the environment (WTO 1994).

Trade ministers in Marrakesh also signed the Decision on Trade and Environment, and created the Committee on Trade and Environment (CTE) with a mandate to: (1) identify the relationship between trade measures and environmental measure in order to promote sustainable development; and (2) make appropriate recommendations on whether modifications are required to provisions of the multilateral trading system.

These WTO rules effectively created a framework for countries to implement measures that address environmental concerns, including trade restrictions, while protecting the rights of other WTO members and avoiding unnecessary trade barriers. However, in the absence of binding obligations to eliminate or reduce barriers to trade in EGS and rules governing non-tariff barriers like subsidies and local content requirements, very little progress can be made in mitigating the negative environmental effects of increased trade.

Obstacles to an EGS Agreement

A central obstacle to successfully negotiating the reduction of barriers to EGS trade is disagreement on the definition of EGS. While individual countries and international organizations like the WTO, the Asia-Pacific Economic Cooperation (APEC) and the Organization for Economic Cooperation and Development (OECD) have proposed new ways to classify EGS, none have been universally adopted.

Underlying the differences are very strong mercantilist tendencies, as countries seek to maximize market access abroad for their EGS exports, while protecting their domestic markets from EGS imports (Hufbauer and Kim 2012).

In the declaration that launched the Doha Round in 2001, WTO members agreed to "the reduction or, as appropriate, elimination of tariff and non-tariff barriers to environmental goods and services" (WTO 2001). Negotiations on environmental goods (EGs) took place at the tariff line level (Harmonized System [HS] 6 digit code) rather than at the product level (HS 8 or 10 digit codes), meaning that all products that fall under a particular tariff line would be subject to tariff cuts, regardless of whether or not they are "environmentally friendly" (Hufbauer, Schott and Wong 2010). A 2011 report issued by the WTO CTE aggregated the lists submitted by WTO members. The core WTO list covers 408 tariff lines based on the HS 2002 classification at the 6 digit level (WTO 2011). However, WTO members have not been able to agree on the appropriate definition of EGs. Developed countries have advocated a broader definition and developing countries have pushed for a narrower definition.

The classification of environmental services faces similar obstacles. Environmental services are classified in the GATS using the United Nations Central Product Classification (CPC) list, which defines environmental services as:

- Sewage services
- Refuse disposal services
- Sanitation and similar services
- Other (cleaning services for exhaust gases, noise abatement services, nature and landscape protection services, other environmental service not elsewhere specified)

This framework, however, is too narrow and outdated to adequately define the current scope of environmental services (Kirkpatrick 2006).

Plurilateral WTO Agreement

With the Doha negotiations at a standstill, a stand-alone agreement negotiated among a core group of WTO members represents a promising path forward. One version of the plurilateral approach was outlined by Hufbauer and Kim (2012) who propose a Sustainable Energy Trade Agreement (SETA). Their proposal is part of a joint initiative – the so-called "Sustainable Energy Trade Initiative" (SETI) – launched by the Global Green Growth Institute (GGGI), the International Center for Trade and Sustainable Development (ICTSD) and the Peterson Institute for International Economics (PIIE), in an effort to facilitate freer EGS trade.

The main elements of the SETA outlined by Hufbauer and Kim (2012) are as follows:

- 10 countries would comprise the core group; 6 candidate countries that add commercial and environmental interests would be in the first tranche of expansion.[68]

68 The 10 core countries are: the three NAFTA members (United States, Canada and Mexico), the 27 members of the European Union, Chile, Colombia, Peru, Australia, New Zealand, Singapore, Japan and Korea. The 6 candidate countries are: Brazil, India, China, Indonesia, Turkey and South Africa.

- The SETA would be inside the WTO framework, but would apply on a conditional MFN basis.[69]
- SETA members would commit to eliminate tariffs on 39 EGs tariff lines at the HS 6 digit level.
- SETA members would commit to phase-out non-tariff barriers over 5 to 10 years.

Table 8.1 lists the 39 tariff lines that would be covered under the SETA. The list comes from the 2011 WTO report that aggregated all proposed list submitted by WTO members into a comprehensive list of 408 tariff lines at the HS 6 digit level. Hufbauer and Kim (2012) identify 32 EGS that fall under the category of "renewable energy" and 6 EGs that fall into the "renewable energy" category and others like "environmental technology."[70] They also include ethanol used for fuel, whose production and use has grown rapidly.

While a list of just 39 EGs may seem small, especially as compared to the WTO compilation that covers 408 tariff lines, trade in these 39 goods is still significant. In 2010, world imports of the 39 EGs were over $200 billion or roughly 1.7 percent of total imports of all products. Excluding intra-NAFTA and intra-EU-27 imports, total imports of the 39 EGs from all core and candidate countries amounted to $102 billion (see table 8.2). Taking into account imports within NAFTA and the European Union, this figure increases to $176 billion, or roughly 78 percent of world imports of the 39 EGs. These figures imply that a SETA that includes core and candidate countries would amount to a "critical mass" and result in handsome trade gains.

With respect to tariff rates, Hufbauer and Kim (2012) find that the trade-weighted average tariff rates for all 39 EGs are in line with average tariff rates for all industrial products. However, MFN bound, MFN applied rates and effective applied rates vary widely among products. For example, the MFN bound rates range from almost zero for solar photo-voltaic devices, to 20 percent for hydraulic turbines, and up to 45 percent for ethanol used for fuel. MFN applied rates range from zero to 15 percent, while effective applied rates in the range of zero to 11 percent.

Turning to country-specific tariff rates, Hufbauer and Kim (2012) find that, on average, developing countries in the core and candidate category maintain high bound and applied tariff rates, while developed members like NAFTA and EU countries have relatively low tariff rates (see table 8.3). For example, MFN bound tariff rates among the developing countries range from 14 percent (Turkey) to 37 percent (Colombia and Indonesia). Effective applied rates range from less than 1 percent (Turkey) to 11 percent (Brazil). Among developed countries, MFN bound rates range from 1.5 percent (Japan) to 11 percent (EU-27), while effective applied rates range from 1 percent (NAFTA) to 2 percent (Australia). Accordingly, Hufbauer and Kim (2012) argue that SETA should not be too difficult to negotiate on a plurilateral basis where low-tariff countries constitute the core. The authors suggest that the product list could be expanded over time through a request-offer approach and the so-called "project approach" that allows special treatment for EGs associated with

69 In order for the SETA to be within the WTO framework, it would require a waiver under Article IX(3) of the Marrakesh Agreement which authorizes the Ministerial Conference to waive an obligation of the WTO Agreement of any Multilateral Trade Agreement under certain circumstances. A waiver requires agreement by three quarters of WTO members.

70 The WTO list covers individual tariff lines with corresponding descriptions and related categories under six broad headings: air pollution control, renewable energy, waste management and water treatment, environmental technologies, carbon capture and storage, and others (WTO 2011).

a specific environmental project. Product expansion would require a 75 percent affirmative vote from SETA members.[71]

Multilateralize the APEC Green Growth Deal

At the 2011 APEC Summit in Honolulu, the Leader's Declaration outlined a "green growth" strategy for 2012 to address the region's economic and environmental challenges. This included a commitment to develop a list of EGs that contribute to green growth and sustainable development, and to reduce applied tariffs rates on these EGs to 5 percent or less by 2015. APEC members also made a commitment to "pursue liberalization of environmental goods and services in the World Trade Organization [...] by exploring creative and innovative solutions to advance the Doha mandate."[72]

At the 2012 APEC Summit in Vladivostok, members endorsed the APEC List of Environmental Goods and reaffirmed their commitment to reduce tariffs on the agreed list by the end of 2015. It should be emphasized that tariff reductions are voluntary and non-binding. The APEC List includes 54 EGs at the HS 6 digit level (see table 8.4), but allows countries to determine whether they apply the cuts to the whole category (the HS 6 digit code) or only to certain products at the HS 8 or 10 digit level that fall within that category.[73]

Like the SETA, the APEC Green Goods List is quite small compared to the list compiled by the WTO. However, trade in the 54 APEC EGs is significant. In 2010, regional trade in the APEC EGs was about $115 billion, and APEC imports from the world of the 54 EGs were $195 billion, or about a 3 percent of total imports (see table 8.5). Moreover, APEC members account for 60 percent of world exports of these products.[74]

A fact sheet circulated by the Office of United States Trade Representative (USTR) reports applied tariff rates in APEC for certain core products. Applied tariffs in the APEC region range from 20 percent on air pollution technologies such as catalytic converters, to 35 percent for renewable and clean energy technologies like solar panels and wind turbines.

Although the commitment is non-binding, the APEC List is an appealing path forward in a number of ways. First, it is the first time major economies have been able to agree on a single list of EGs. Second, the APEC List uses nomenclature from the HS 2012 code, whereas the WTO list refers only to the HS 2002 code. In that sense, the APEC List provides a more updated and representative list of EGs. Finally, the APEC List is broadly representative: all but four tariff lines in the APEC List are covered in the WTO's comprehensive list. This implies that it should not be difficult for WTO members to adopt the APEC List. Indeed, WTO Director General Pascal Lamy reported to the WTO

71 Hufbauer and Kim (2012) suggest that voting be calculated in two ways: (1) one country, one vote; and (2) weighted according to a country's combined imports and exports of SETA products. This would ensure the SETA is expanded in a meaningful way.

72 Asia-Pacific Economic Cooperation, "2011 Leaders' Declaration," http://www.apec.org/Meeting-Papers/Leaders-Declarations/2011/2011_aelm.aspx (accessed on December 11, 2012).

73 "WTO Members Face Hurdle to 'Multilateralizing' APEC Green Goods Deal," *Inside US Trade,* November 2, 2012, www.insidetrade.com (accessed on November 2, 2012).

74 United States Trade Representative, "APEC List of Environmental Goods: Promoting Exports, Creating Jobs, and Advancing Green Growth and Sustainable Development," http://www.ustr.gov/about-us/press-office/fact-sheets/2012/september/apec-environmental-goods (accessed on December 11, 2012).

General Council that WTO members should consider how to multilateralize the APEC green goods deal.[75] What's more, Lamy identified an agreement on EGs as a potential outcome for the 9th WTO Ministerial Conference scheduled for December 2013 in Bali, Indonesia. The obstacle, however, is that WTO agreements are binding commitments not to exceed specified tariff rates, whereas the APEC approach represents a voluntary best efforts undertaking.

Trade Gains

To evaluate the potential payoff from an agreement on EGs we use estimates from Hufbauer, Schott and Wong (2010) and the World Bank (2007), who calculate the increase in trade that results from eliminating tariffs on selected EGs.[76]

Hufbauer, Schott and Wong (2010) estimate the trade gains from a sector initiative on EGs that would reduce tariffs to zero. The authors take a sample of 22 developed and developing countries and estimate the gains from complete tariff elimination for a list of select EGs.[77] To calculate the impact of the tariff cuts the authors multiply the tariff cut (expressed in percentage points) by a price elasticity of -2.10 for every bilateral trade relationship.[78] Their results show that exports of EGs to the 22 countries would increase by 4.1 percent, while imports by the 22 countries from the world would increase by 4.7 percent.

The 2007 World Bank study used a partial equilibrium model to estimate the impact of the elimination of tariffs on four basic clean energy technologies – wind, solar, clean coal and efficient lighting – which correspond to 12 tariff lines at the HS six-digit level.[79] The study used trade and tariff data for the top 18 greenhouse gas-emitting developing countries and assumes that tariffs on the specified EGs are completely eliminated.[80] Under this scenario, the World Bank finds that trade volumes of the specified EGs would increase by 7.2 percent.

We apply these results to current EGs trade flows to estimate the potential trade grains from the APEC and SETA initiatives. In 2010, exports of the 21 APEC members to one another were $115 billion and APEC imports from the world were $195 billion. Applying the Hufbauer, Schott and Wong (2010) coefficient (4.7 percent) suggests an additional $9.1 billion in APEC imports. Applying the World Bank (2007) coefficient (7.2 percent) suggests an additional $14.1 billion in APEC imports. Taking a simple average of the two methodologies, yields average gains of $11.6 billion imports (see table 8.6). Applying the same logic to the SETA plurilateral initiative produces an additional $9.0 billion imports. Of course one country's imports are another country's exports. Hence, averaging these calculations, we conclude that a meaningful WTO EGs agreement, even on a plurilateral basis, could deliver $10.3 billion of additional exports.

75 "Lamy Focused on Delivering Package of Outcomes by next Ministerial," *Inside US Trade,* October 4, 2012, www.insidetrade.com (accessed on November 5, 2012).

76 The list of EGs used by Hufbauer, Schott and Wong (2010) and by the World Bank (2007) overlap in 10 tariff lines.

77 The authors use a list of 45 EGs at the HS six-digit level developed by the World Bank (2007).

78 The elasticity is calculated as a simple average of all EGs observations found in Kee, Nicita and Olarreaga (2004). For a more detailed discussion of this and the methodology used to calculate GDP gains, see Annex A in Schott, Hufbauer and Wong (2010).

79 The tariff lines are: 840510, 840619, 841181, 841182, 841199, 848340, 848360, 850230, 850720, 853710, 853931, 854140.

80 The sample countries are: Argentina, Bangladesh, Brazil, Chile, China, Colombia, Egypt, India, Indonesia, Kazakhstan, Malaysia, Mexico, Nigeria, Philippines, South Africa, Thailand, Venezuela, and Zambia.

Jobs Supported

Table 8.7 translates this potential trade expansion of $10.3 billion exports to additional jobs supported, following the methodology explained in Appendix A. Jobs coefficients are derived from employees per billion US dollars of GDP in tradable sectors of the economy (based on value added in industry) for developed and developing countries. Applying these jobs coefficients to the average export gains from an EGs agreement, developing countries would collectively see export jobs expand by roughly 29,000. Among the selected countries, NAFTA (United States, Canada, and Mexico) would reap the largest gains with approximately 9,900 potential jobs, followed by New Zealand with a total of 5,900 potential jobs. Developing countries would by far reap the largest gains collectively, with approximately 228,000 jobs. Combining developed and developing countries, we calculate the global EGs trade gains of $10.3 billion would translate to total employment gains of 256,000 jobs.

GDP Increases

The payoffs from the EGs agreement extend beyond trade gains and jobs supported to include, as well, higher world GDP. Again we refer to the methodology explained in Appendix A. To calculate the world GDP increase resulting from $10.3 billion of additional exports, we use the average dollar ratio from table A.3, namely 0.46. Since dollar ratios are based on two-way trade, we double the calculated exports. Consequently, we estimate that the two-way trade gains of $20.6 billion delivered by a meaningful EGs agreement would translate to world GDP increases of approximately $9.5 billion.

9. NEW ISSUES FOR THE WTO RECOVERY PACKAGE

As the Doha talks have foundered, pundits have suggested new issues that WTO members ought to consider. Extreme voices within the pundit class argue that the WTO should discard the "20th century" questions that have occupied Doha negotiators, and instead tackle a "21st century" agenda. We regard such proposals as totally impractical: how can the WTO hope to launch negotiations on entirely new questions after it has dashed the rightful expectations of the vast majority of WTO members on questions they regard as vital?

Indeed, at this late day, we counsel against adding controversial new issues to the WTO Recovery Package. Such questions as the operation of state-owned enterprises (SOEs), undervalued currencies, and broad application of GATS Mode 4 should only be tackled once the Recovery Package has been sealed and delivered. That said, there are two topics of great interest to the business community that could be ripe subjects for task force exploration during 2013, but not fresh agreements. The first topic is "learning from regional trade agreements (RTAs)"; the second topic is "learning from bilateral investment treaties (BITs)".

Learning from RTAs

In 2009, two distinguished trade scholars, Richard Baldwin and Patrick Low, published a collection of essays under the title *Multilateralizing Regionalism*. One recurring theme was the potential extension of liberalization agreed in RTAs to the broader community of WTO members. Another theme was the call for greater transparency, not only as to the plain meaning of RTA texts but also as to their practical application.

The WTO has flexible disciplines, contained in GATT Article XXIV and GATS Article V that allow RTAs to derogate from the fundamental MFN principle. The language of those articles is vague and their application has been abused. RTAs have included important sectoral exceptions (e.g., agriculture) and embody rules of origin that effectively discriminate against third country trade and investment.

A vast literature explores these problems and offers numerous creative but impractical ideas for fixing them. The definitions and standards by which RTAs are judged against WTO norms are deliberately fuzzy and are likely to remain so. To date, efforts to negotiate new multilateral disciplines on RTAs have yielded modest and mostly hortatory results.

Uruguay Round. The Uruguay Round included an "Understanding on the Interpretation of Article XXIV of the General Agreement on Tariffs and Trade 1994" which attempted to clarify key obligations regarding the transition period for phasing in RTA liberalization ("should exceed 10 years only in exceptional cases") and the use of weighted average applied tariffs to determine whether the RTA raised barriers to third-country trade.

Doha Round. In the Doha Round, rules on RTAs have again been vetted, pursuant to paragraph 29 of the Doha Ministerial Declaration. In December 2006, the WTO General Council established a new "Transparency Mechanism for Regional Trade Agreements" that is being implemented on a provisional basis. This approach follows the precedent of the Trade Policy Review Mechanism (TPRM), which was authorized and applied provisionally until the Uruguay Round accords were signed in 1994.

As drafted, the new obligations are marginally useful. Their main objective is to get countries to notify the WTO when they are negotiating RTAs and then supplement that notice with details about the pact once it is signed (paragraph 1). The provisional accord specifies that notifications generally should be made "no later than" the time of ratification and "before the application of preferential treatment between the parties" (paragraph 3). Either the Committee on Regional Trade Agreements or the Committee on Trade and Development (for pacts between developing countries) will then review the submissions based on a "factual presentation of the RTA" prepared by the WTO Secretariat. However, the mechanism forbids the Secretariat report from making "any value judgment" and precludes the use of the report in any dispute settlement procedure (paragraphs 9 and 10). Importantly, the new mechanism also requires that members of existing RTAs notify "changes affecting the implementation of an RTA" as soon as possible after they occur, and submit a final report on the completion of the implementation of the pact (paragraphs 14 and 15). These submissions will alert WTO members when RTA preferences, or RTA provisions such as rules of origin, are modified, and afford members the opportunity for additional consultations on the RTA (paragraph 16).

The biggest problem with the new mechanism is not the notification procedures but rather the specification of what must be notified. The required data required relate primarily to tariffs on goods and other traditional border measures (including quotas and safeguard measures). For services, RTA members are supposed to submit general economic statistics; regulatory policies and practices that confer preferences on firms from RTA member countries are not included. "Relevant statistics on foreign direct investment (FDI)" are required only for services— an odd limitation.

In sum, despite the new transparency mechanism, WTO members continue to favor their traditional "don't ask too much, don't tell too much" policy toward RTAs. Moreover, they are adamant that Secretariat reports must not lay the groundwork for WTO disputes that would challenge RTA practices. These limits reflect the old "glass house syndrome": countries are reticent to "throw stones" at others for fear that their own agreements will come under scrutiny.

Improved Transparency Mechanism

Respecting these political realities, as a first step, WTO members should agree to elevate the Transparency Mechanism from the status of provisional application to definitive application. As a second step, we offer a few suggestions for exploratory analysis that could lay the groundwork for future improvement of the Transparency Mechanism. The suggestions that follow are meant to apply, in the first instance, to large RTAs, namely NAFTA, EU agreements with associated members (countries outside the core 27), Mercosur, ASEAN, and the Trans-Pacific Partnership (when ratified).

MFN Provisions. For most services, RTA rules do *not* discriminate against third country suppliers. The happy result flows from the general absence of tracing mechanisms that seek to identify the ultimate owners of service firms. Thus, a service firm with "third country" equity participation, based in one RTA partner, generally enjoys preferential access to the scheduled service market of the other RTA partners.

Moreover, in many cases, RTA provisions contain an MFN clause for access to service markets. Thus, if an RTA member subsequently concedes better access terms to a third country, the original RTA

partner will enjoy the same concession. Since services represent a growing share of world trade and investment, these provisions are both constructive and significant.

As with services, investment liberalization rules agreed in most RTAs generally do not discriminate against third countries.[81] Again, the reason is that most investment rules do not have overly strict tracing mechanisms.

Our suggestion for improving the Transparency Mechanism is that the WTO should systematically identify MFN provisions in RTAs, and indicate their scope in terms of trade or investment coverage. The initial focus, as already indicated, should be the large RTAs. In time, some of these might prove to be easy candidates for inclusion in the WTO's own rulebook.

WTO-Plus Chapters. Beyond eliminating tariffs, an important reason countries enter RTAs is to write new rules on labor, environment, investment and other frontier questions. Our suggestion for the Transparency Mechanism is to catalogue the subject matter of WTO-plus chapters, and analyze their trade and investment coverage, again with a focus on the large RTAs. As with MFN provisions, this analysis might pave the way for adoption of some WTO-plus rules by the universe of WTO members.

Rules of Origin. The World Customs Organization (WCO) has created a database of preferential rules of origin prescribed by RTAs. This information should be matched by the WTO with the MFN tariff rate schedules of the RTA members to identify sectors where the MFN tariffs do not differ greatly (say not by more than 2 percentage points). In such cases, the WTO could point out to the RTA members that rules of origin are not needed to prevent "trade deflection" – the practice of exporting goods to the lowest tariff RTA member and then transshipping them to the other members – for the simple reason that the transshipment costs will eat up the tariff advantage.

Taking the process a bit further, RTA partners – starting with the large RTAs – should seek to harmonize (within a margin of 2 percentage points) the tariffs that each member applies to third countries on an MFN basis. To facilitate the harmonization process, the WTO could identify sectors where RTA members could easily attain a reasonable degree of harmonization in applied tariffs, and thereafter eliminate rules of origin since "trade deflection" would no longer be a serious problem.

Learning from BITs

Over 3,100 Bilateral Investment Treaties are now in force, and the number is growing by about 50 a year. While these cover two-thirds of global FDI, UNCTAD (which tracks the statistics) estimates that 14,000 BITs would be needed to ensure relatively full coverage for WTO members.[82] Investment chapters in many RTAs amplify the investment protections and rules contained in BITs, but again many WTO members do not belong to these RTAs. Moreover, the BITs and RTAs are by no means cut from the same template. Global corporations must dedicate skilled professionals to keep track of their rights in multiple countries. Government agencies charged with welcoming inward foreign direct investment (FDI) are equally challenged trying to keep up with the BIT and RTA terms offered

81 However, some RTAs offer a fixed number of licenses for branches or subsidiaries of companies based in the partner country, but not based elsewhere.

82 UNCTAD, World Investment Report 2011, p. xvii.

by their neighbors. All in all, the present landscape of international investment rules calls out for rationalization.

Past Attempts. But the attempt to construct multilateral standards must proceed with caution. In 1970, Paul Goldberg and Charles Kindleberger advocated a "GATT for Investment".[83] The fact of little progress during the subsequent four decades speaks to formidable headwinds. The Marrakesh Agreement that concluded the Uruguay Round in 1994 contained only a modest code on investment issues, the Agreement on Trade-Related Investment Measures (TRIMs) that curtailed performance requirements linked to inward FDI. In the late 1990s, the OECD launched negotiations for a Multilateral Agreement on Investment (MAI), but talks were abandoned in the face of public opposition and a French veto.[84] At the Singapore WTO Ministerial (1996), investment was put on the Doha Round agenda, only to be dropped at the Cancun Ministerial (2003) owing to opposition from developing countries led by Brazil and India. Yet, throughout this period, the policy environment for MNCs and FDI has become progressively more favorable, reflected in thousands of new BITs, scores of RTAs, lower corporate taxes, and an array of investment incentives.

Political Resistance. Underlying these cross-currents are deep political forces. Countries want the freedom to wall-off select sectors of the national economy from foreign ownership – natural resources, telecommunications and transport hubs come to mind. They want the power to exclude certain foreign corporations from acquiring domestic companies by invoking loosely defined "national interest" and "national security" filters. At the same time, most countries have learned that inward foreign investment creates jobs, fosters exports, improves productivity, and links the local economy to global value chains. As one means of attracting MNCs, many countries are willing to tie their hands with respect to the right of establishment (apart from excluded sectors), national treatment (once the foreign firm has established a business presence), compensation for expropriated assets or regulatory takings, and other matters. But other countries want to retain the power to pick and choose among suitors in the MNC gallery. India and China come to mind. Hence it has been difficult to make headway on multilateral rules.

Common Provisions. That said, we think the WTO can do useful work preparing the ground for a multilateral framework. The place to start is systematic analysis of the terms and coverage of existing BITs and RTAs. For this exercise, the WTO should seek cooperation with UNCTAD and other specialized agencies. Here are suggested specifics:

- Examine the definitions of covered "investment" and the relevant fractions of world FDI and associated interests. For example, to what extent are minority (non-controlling) interests covered?; are bonds and trade credits covered?; what about copyrights and patents?

- Identify the sectors excluded from the right of establishment, and survey the scope of "national interest" and "national security" screens.

83 Paul M. Goldberg and Charles P Kindleberger. 1970. Toward a GATT for Investment: A Proposal for the Supervision of the Multinational Corporation. *Law and Policy in International Business* 2, no. 2:295-325. A contemporary advocate was C. Fred Bergsten. 1974. Coming Investment Wars? *Foreign Affairs* 53: 136-39.

84 Edward M. Graham. 2000. *Fighting the Wrong Enemy: Antiglobal Activists and Multinational Enterprises.* Washington: Peterson Institute for International Economics.

- Assess the extent to which foreign investors are guaranteed the right to repatriate earnings and capital.
- Assess the extent to which foreign investors are allowed to bring in foreign managerial and technical personnel (GATS Mode 4).
- Summarize definitions and provisions calling for "sustainable development", a relatively new topic for BITs and RTAs.
- Evaluate the scope of national treatment provisions: do they cover licenses and permits?; taxation?: industry subsidies?; environmental obligations?
- Evaluate the provisions for dispute settlement and compensation: do they ensure arbitration (e.g., under ICSID procedures)?; do they only contemplate diplomatic representation?; are awards enforceable in any jurisdiction where the defending government or company has property?

We speculate that broad agreement between BIT and RTA provisions will be found for many topics, and the provisions in question will have widespread coverage. If that's right, then perhaps the ground will be prepared for WTO members to discuss a multilateral framework of common rules, even if minimalist in nature.

FDI Protectionism. We seriously doubt that the WTO can write rules to curtail FDI protectionism. But the WTO Director General can use his bully pulpit to raise awareness among G-20 leaders, and he can draw on extensive UNCTAD analysis to build his case. Evidence gathered by UNCTAD on FDI policy changes shows a marked shift, in the past three years, from an overwhelming preponderance of new liberalization (formerly about 90 percent of policy changes) to a growing appearance of new restrictions (recently about 25 percent of policy changes).[85] New restrictive measures apply both to FDI inflows and FDI outflows (particularly in Europe). This is worrisome, because FDI serves as the lynchpin of global value chains (GVCs), the likely engine for trade growth over the decades ahead. While restrictive measures are not the main reason for the sharp fall in FDI flows from their peak of $2.1 trillion (2007) to around about $1.6 trillion (2012), they may have contributed, and that adds to concern about policy trends. Again, our suggestion is that the WTO Director General should use his soap-box, not attempt to engage in the institution in writing new rules.

85 UNCTAD, World Investment Report 2012.

10. DISPUTE SETTLEMENT SYSTEM REFORMS[86]

Introduction

The dispute settlement system, created by the Dispute Settlement Understanding (DSU), is often called the "crown jewel" of the World Trade Organization. Between its inception in 1995 and 2011, the Dispute Settlement Body (DSB) – the organizational structure of the DSU, comprised of consultation services, initial panels and the Appellate Body – has handled 427 complaints, brought by members at all levels of development.[87] In the great majority of cases, the losing member alters its laws or regulations to conform to the WTO rule book, without further ado. In fact, many complaints are settled through consultations, and over the entire period 1995 to 2011, only 132 panel reports have been circulated, and appeals taken to the Appellate Body in just 90 cases. In 25 of the decided cases, a subsequent arbitration was held to determine a "reasonable period of time" for compliance (DSU Article 21.3), and in 12 cases (with some overlap), a subsequent arbitration was held to determine the appropriate level of retaliation ("suspension of concessions" under DSU Article 21.6).

While on the whole the DSU has performed admirably, during the long course of Doha Round discussions, several technical reforms have been proposed, in an effort to allow for more participation by all WTO members and ensure full consideration of the issues. The proposals deal with such matters as:

- The extension of third party rights in panel and Appellate Body hearings;
- Improved conditions for members to join in consultations;
- Better notification of mutually agreed solutions between contesting members;
- Better "special and differential treatment" for developing country members;
- Interim review and remand procedures at the discretion of the Appellate Body;
- Enhanced compensation as a temporary remedy for breaching WTO law.

Some of these technical reforms should be acceptable to all WTO members, as part of the WTO Recovery Package. During 2013, however, these and more ambitious reforms ought to be considered with an eye on the two overriding problems facing the dispute settlement system: time and money. Both problems result from the fact that the system was designed by governments largely to protect themselves from litigation, rather than to rigorously enforce the rulebook.

Lost Time

Everything takes too long and deadlines keep stretching. Some of the proposed technical reforms, such as adding a remand or interim review procedure, would inevitably add to the delay. As general advice, once a company decides to pursue a case through its government, it can easily take three

86 Gary Horlick, a trade attorney both highly experienced and widely recognized, made valuable suggestions for this section.

87 For a complete statistical analysis of complaints through 2011, see Kara Leitner and Simon Lester, "WTO Dispute Settlement 1995-2011 – A Statistical Analysis," Journal of International Economic Law, vol. 15, no. 1, March 2012.

years to secure both a panel report and an Appellate Body decision. If the losing government does not comply, it may take another two years for the "suspension of concessions" to be authorized and force a satisfactory resolution.

As tables 10.1 and 10.2 show, in recent cases, the average time for consultation is around 80 days, the average time for completion of panel reports is around 470 days, and the average time for completion of recent Appellate Body decisions is 130 days.[88] Adding the average times for these three phases, and assuming the losing country complies without objection in 120 days,[89] the overall time for WTO machinery to deliver satisfactory result *in an average case* is around 800 days. While statistics are not available, bureaucratic delay might add another 180 days for a company to persuade its government to launch a meritorious case in the WTO. All in all, the *average* time line from a company decision to launch a case and final resolution can easily reach 980 days, almost three years. This is the *average*; and, when the losing country refuses to comply, the retaliation process will take another two years.

Important reasons for slow panel reports are: (a) it takes weeks or months for the contesting members to agree on a panel; (b) panelists are typically busy experts drawn from far corners of the globe, making it difficult to coordinate their schedules for hearings in Geneva; (c) translation of decisions into the three WTO languages (English, French, Spanish) is usually delayed by backlogs. Apart from delays in issuing panel reports, other parts of the overall process also work too slowly.

At a national level, each business community should press its government to establish and adhere to short timelines for the decision whether or not to bring a case to the WTO. To accelerate the WTO's own consultation and panel process, and to ensure impartiality, several changes are necessary:

- Sitting government officials should not serve as panelists, and the bar against nationals of a contesting party serving on panels should be dropped.
- All panel and Appellate body hearings should be simultaneously webcast.
- The mandatory 60-day consultation period before setting up a panel should be eliminated.
- If contesting parties cannot agree on a panel within 30 days, the Director General should select panelists from a standing roster within the next 15 days.
- As with other WTO documents, panel rulings should be circulated first in English so that Appellate Body review can proceed while translations are done.

88 The DSU commends the Appellate Body to complete its review of panel reports within 60 days, and suggests that no more than 15 months should elapse between the establishment of a panel and the determination of the "reasonable period of time" for a losing party to comply. However, these guidelines are honored in the breach. The panel process can be initiated 60 days after the first request for consultations.

89 Under DSU Article 21.3, the guideline maximum for the "reasonable period of time" for a country to comply is 15 months (450 days) after the panel report or Appellate Body decision was adopted. In difficult cases, even this time window is breached. In fact, there is far too much compliance abuse, as explained by David J. Townsend and Steve Charnovitz, "Preventing Opportunistic Uncompliance by WTO Members", Journal of International Economic Law, volume 14, number 4, June 2011.

Lost Money

For the private sector, delays in WTO justice are exacerbated by the fact that there is no compensation for litigation costs or retrospective damages, even when the complaint prevails hands down. That winnows out a lot of meritorious cases in which the WTO rulebook is ignored, since almost no government is willing to bring a case without private sector pressure. The Geneva mindset has so far rejected every proposal for retroactive remedies and monetary damages, arguing such suggestions are "dangerous," even though retaliation by raising tariffs sideswipes innocent buyers, both households and business firms. Needed are remedies that make the aggrieved private parties whole, along with escalating penalties when losing members are slow to comply. Specific recommendations include:

- Losing members should pay the litigation costs of prevailing members, capped at a reasonable figure such as $5 million. The arbitrator should determine the level of costs and the financial obligation of each party. WTO members should be encouraged to compensate the litigation costs incurred by private firms before compensating their own costs; moreover private firms that stand behind WTO cases should be obligated to pay the litigation costs of the WTO opposing member in the event of an adverse decision.

- Panelists should have the power, at their discretion, to award retrospective money damages to the prevailing member, from the time a complaint is filed until the time the panel report is circulated. Any damages so awarded should be paid over by the prevailing member to the injured private parties.

- If the losing member takes more than a "reasonable period of time" to correct its WTO violation, then the compliance panel should have the power to assess money damages to compensate the prevailing member (and its private firms) for the excessive delay. Moreover, the compliance panel should have the power to levy progressive penalty damages the longer the losing member drags its feet.

Extension of the DSU

We also suggest for consideration – not necessarily for an agreement in 2013 – an optional extension of the DSU for resolving disputes between RTA partners. As mentioned, and despite its flaws, the DSU is rightly called the "crown jewel" of the WTO system. By contrast, most RTAs have weak or non-existent dispute settlement systems. Often that reflects the preference of RTA members – they want prescriptive not binding rules, and they want differences to be resolved by diplomats, not jurists. However, some RTAs might prefer a robust dispute settlement system. If it was available, these RTAs might want the tested system of Geneva jurisprudence.

Accordingly, we commend WTO members to consider opening the DSU to RTA partners on their request. This would require a pact between the WTO and the RTA dealing with such matters as expenses, conduct of hearings, and publication of panel reports and Appellate Body decisions. One immediate concern might be an overload on the DSU system. Along the lines we have already suggested, the panel process could be streamlined, and Appellate Body members might be required to spend more months in Geneva (currently the world load is no more than half time). Moreover, any WTO/RTA pact could give a preference, as needed, to cases within the WTO system.

APPENDIX A

Calculating Export Gains, Jobs Supported and GDP Increases

We use three metrics to quantify the potential payoffs from the seven agreements examined in this Policy Brief: export gains, jobs supported, and GDP increases. The starting point for assessing six of the seven agreements is the dollar amount of export gains (where the methodology used for calculating export gains is explained agreement-by-agreement). In the case of food export controls, the starting point is the GDP cost to food importing countries.

For the six agreements where we start with calculated export gains, we build on these estimates to calculate jobs supported and GDP increases. To calculate these benefits we start with employment and GDP data by country group as outlined in Tables A.1 and A.2.

Export Jobs Supported

If concluded, the six agreements will expand the number of jobs supported through larger exports of goods and services. The concept of "jobs supported" is not equivalent to "jobs added," since two-way trade expansion will realign the labor force between sectors. It must be emphasized, however, that export jobs are generally better paid than jobs in other sectors of the economy.

Table A.1 shows the estimated jobs coefficients per billion dollars of exports for developed and developing countries by region. The jobs coefficients are derived from employees per billion US dollars of GDP in the tradable sectors of the economy (based on value added data for industry). These figures provide the basis for determining the potential jobs supported from each agreement. An important methodological caveat must be noted: exporting firms consistently exhibit higher labor productivity than non-exporting firms. For this reason, we have cut in half the jobs coefficients calculated for industry at large in each region to obtain a rough estimate of the jobs coefficients for each billion dollars of additional exports.

Since labor productivity is much lower in developing countries, the resulting jobs coefficients are more than double and in many cases quadruple the coefficients for developed countries. Developed countries have an average of 5,500 employees per billion US dollars of merchandise exports; East Asia and the Pacific have on average approximately 42,000 employees; and South Asia is even higher with 122,500 employees. These job coefficients are used in the calculations for all agreements with merchandise export gains.[90] For the International Services Agreement (ISA), since comparable regional data is not available for employees per billion US dollars of GDP in tradable services sectors, we use detailed financial and business services employment data for OECD countries to estimate the jobs coefficients and thereby jobs supported in tradable services. This data is reported in the tables for chapter 2.

90 We do assume that the same jobs coefficients (derived from employees per billion US dollars of GDP in the tradable sectors) apply to service exports for agreements like the Information Digital Economy Agreement (IDEA), where the calculated export gains include exports in both goods and services.

GDP Increases

Table A.2 shows average GDP per capita and employment share of the population in 2010, distinguishing between country income levels and regions. Of all regions, North America and Europe & Central Asia exhibit the highest figures for GDP per capita, approximately $47,000 and $22,400 respectively. Among developing countries, the regions of Latin America & the Caribbean and Europe & Central Asia have the highest GDP per capita of $8,700 and $7,500 respectively, while South Asia and Sub-Saharan Africa have the lowest levels. It is worth noting that GDP per working person is nearly ten times higher in OECD countries than in middle income countries; while the income of least developed countries (LDCs) (as designated by the United Nations) is a small fraction of the OECD average.

These fundamental differences are reflected in the calculations of potential GDP increases. Based on the methodology set forth in Hufbauer, Schott and Wong (2010), we utilize GDP coefficients per billion dollars of two-way trade to capture the GDP increases that arise through multiple channels when trade expands.[91] These GDP coefficients are called "dollar ratios" and relate the dollar increase in GDP to the dollar increase in two-way trade. It must be emphasized that "dollar ratios" are based on two-way trade (exports plus imports), based on the well-established proposition that larger imports are just as important as larger exports, as they "both contribute to higher GDP through lower consumer prices, more variety, greater productivity, and improved allocation of resources" (Hufbauer, Schott and Wong 2010). To account for the imports implied by the export gains resulting from the six agreements under examination, we double the calculated export gains on the assumption that the additional imports will equal additional exports (this is true for the world as a whole and roughly true for each country).

Table A.3 presents the dollar ratios, based on regression models and computable general equilibrium (CGE) models constructed by different scholars. As shown on table A.3, there is a large variation in the growth ratio estimates. The smaller growth ratios are generated by so-called "plain vanilla" CGE models, which attribute GDP gains largely to the reallocation of resources to sectors with comparative advantage. The larger ratios are generated by regression models as well as CGE models, which incorporate structural changes in the analysis; importantly, these models account for a broader range of gains from international trade expansion, such as greater product variety in imports, higher firm productivity in both importing and exporting countries, and economies of scale and scope.[92] We believe the latter framework better captures the payoff from expanded international trade.

Recognizing the wide variation in estimated national and regional growth ratios, we calculate a single growth ratio for the world. For the GDP increase calculations in this Policy Brief, we utilize the simple average dollar ratio for the world, namely 0.46, reported at the foot of table A.3. This ratio suggests that, over the long term, a $10 billion growth in two-way trade in goods and services will boost world GDP by $4.6 billion. To calculate GDP increases, the dollar ratio is applied to twice the dollar-amount of export gains (to account for higher imports) calculated in six of the agreements. In the case of food export controls, the GDP increase is calculated as the losses averted by food importing countries. The average dollar ratio of 0.46 is similar to the 0.48 figures derived in Brown, Deardorff, and Stern (2001), a well-respected global study of multilateral and regional trade liberalization

91 For detail on the multiple channels by which trade expansion increases GDP, see Bradford, Grieco and Hufbauer (2005).

92 For more detail see Hufbauer, Schott, and Wong (2010), pp. 110 – 112

using CGE analysis, and OECD (2003a) a study on economic growth in developed countries using regression analysis.

It is worth noting that using a single average dollar ratio for the world creates broad estimates of GDP increases that probably do not capture the distributional effects of individual agreements on advanced countries, emerging countries, and least developed countries. Estimated dollar ratios for developing countries based on trade expansion scenarios often exceed the ratios estimated for developed countries. The reason is that developing countries usually have higher pre-existing trade barriers, and the payoff from trade liberalization is greater when the starting point is a highly protected economy. It seems likely that in the case of agreements such as trade facilitation, which may have a larger relative effect on trade expansion in developing countries, the estimated GDP increases we report may be understated. Conversely, in the case of agreements with a higher relative impact on developed countries, such as services, the estimated GDP increases may be overstated.

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Table 2.1

Estimated gains to merchandise exports from trade facilitation improvements

	Export gains			
	Billions of dollars		Percent	
Country region	World Bank[2]	PIIE[3]	World Bank	PIIE
Developed countries[1]	949	475	8,9	4,5
Developing countries	1 137	569	19,7	9,9
East Asia	534	267	19,8	9,9
East Europe and Central Asia	202	101	16,7	8,4
Latin America and Caribbean	301	151	29,5	14,8
Middle East and North Africa	30	15	20,0	10,0
South Asia	10	5	2,9	1,5
Sub-Saharan Africa	60	30	27,0	13,5
Total[4]	2 086	1 043	28,6	14,3

1 The estimate for developed country export gains was scaled to developing country exports gains [1,137*0.84 = 949] using the ratio of developed country export gains to developing country export gains from improvements to trade facilitation [39.5/47.3 = 0.84], from Hufbauer, Schott, and Wong (2010).

2 Estimates are based on World Bank simulations which assume each country improves its trade environment quality halfway to the top performer in that region. See Wilson and Portugal-Perez (2010), Figure 4. Potential trade gains are calculated from 2011 trade data using the IMF's Direction of Trade Statistics, (accessed June 2012).

3 PIIE estimates halve the export gains estimates based on World Bank simulations. This is because a trade facilitation agreement only represents the beginning and not the end of slashing avoidable trade costs. Among issues not covered in the trade facilitation agreement are rules of origin in regional trade agreements, intermodal transport frictions (boat to rail, etc.), and free trade in logistics services (customs brokers, express delivery, trucking, etc.). The halved numbers thus better reflect the potential trade gains from an agreement that will not immediately resolve all of these issues.

4 Total is comprised of subtotals for developed countries and developing countries.

Sources: Hufbauer, Vieiro and Wilson (2012) and Wilson and Portugal-Perez (2010).

Table 2.2

Estimated jobs supported from trade facilitation improvements to merchandise exports

Country region	Export gains[1] ($ billions)	Employees per billion US$ value added in industry[2]	Estimated jobs supported (thousands)
Developed countries	475	5 500	2 610
Developing countries	569	–	18 022
East Asia	267	41 500	11 081
East Europe and Central Asia	101	21 500	2 172
Latin America and Caribbean	151	19 500	2 935
Middle East and North Africa	15	12 500	188
South Asia	5	122 500	613
Sub-Saharan Africa	30	34 500	1 035
Total[3]	1 043	–	20 632

1 Export gains are drawn from PIIE estimates, from Table 2.1

2 Regional values based on the World Bank region designations (see Appendix, table A.1).

3 Total is comprised of subtotals for developed countries and developing countries.

Sources: Employees per value added calculated from World Bank World Development Indicators database and International Labor Organization (ILO), Global Employment Trends, 2012; Jobs supported from authors' calculations.

Table 2.3

Estimated GDP increase from two-way trade gains from improvements in trade facilitation
(billions of dollars)

Region	Export gains	Two-way trade gains[1]	GDP increase[2]
Developed countries	475	949	437
Developing countries	569	1 137	523
East Asia	267	534	246
East Europe and Central Asia	101	202	93
Latin America and Caribbean	151	301	138
Middle East and North Africa	15	30	14
South Asia	5	10	5
Sub-Saharan Africa	30	60	28
Total	1 043	2 086	960

1 Two-way trade gains are calculated as double the amount of exports.

2 Following the methodology in Appendix A, to calculate GDP increases, we apply an average dollar ratio of 0.46 to two-way trade figures.

Source: Authors' calculations.

Table 2.4

Contribution of improvements in trade facilitation indicators (TFIs) to the reduction in trade costs (percent)

Trade Facilitation Indicator (TFI)	**Potential reduction in trade costs** (percent)
a. Information availability	–
b. Involvement of trade community	–
c. Advance rulings	3,7
d. Appeal procedures	–
e. Fees and charges	1,7
f. Formalities: documents	0,2
g. Formalities: automation	2,7
h. Formalities: procedures	5,4
i. Cooperation: internal	–
j. Cooperation: external	1,2
k. Consularization[1]	–

1 Refers to consular transaction requirements: the procedure of obtaining from a consul of the importing country any customs documentation related to importing a good, such as a consular invoice or visa for a commercial invoice, certificate of origin, shippers' export declaration, etc.

Notes:

A dash (–) represents a TFI that is non-significant or does not bear the expected sign.

For a detailed explanation of the TFIs see pp. 13-26 of Moïsé, Orliac and Minor (2011).

Source: Moïsé, Orliac and Minor (2011).

Table 3.1

Tradable services in the United States

Industry	NAICS code	Value add to US GDP ($ billions)[1]	Employment (thousands)	Share of private sector employment[2] (percent)
Information	51	403	2 720	2,4
Finance and insurance	52	623	5 720	5,1
Real estate and rental and leasing	53	1 242	2 015	1,8
Professional, scientific, and technical services	54	1 765	7 603	6,8
Management of companies and enterprises	55	1 096	1 853	1,6
Arts, entertainment, and recreation	71	139	1 944	1,7
Other services, except government	81	357	6 743	6,0

NAIC = North American Industry Classificiation System

1 Data for 'value add to US GDP' is from 2010.

2 Private sector employment excludes public sector employees.

Sources: Jensen (2011), Hufbauer, Moran and Oldenski (forthcoming).

Table 3.2

Tariff equivalents of services barriers for 21 countries (percent)

Country	Current tariff equivalent
Argentina	33,1
Australia	16,1
Brazil	55,5
Canada	15,4
China	67,9
Colombia	40,9
European Union	6,7
India	68,1
Indonesia	67,9
Japan	16,8
Korea	25,0
Malaysia	28,8
Mexico	44,3
Norway	0,0
Pakistan	68,1
Philippines	55,4
South Africa	39,7
Switzerland	3,4
Thailand	44,1
Turkey	43,9
United States	6,0

Source: Hufbauer, Schott and Wong (2010), Appendix B, table B.2

Table 3.3

Services Trade Restrictiveness Index (STRI) for 21 countries

Country	STRI
Argentina	17,0
Australia	20,2
Brazil	22,5
Canada	21,6
China	36,6
Colombia	18,3
EU-20	26,1
India	65,7
Indonesia	50,0
Japan	23,4
Korea	23,1
Malaysia	46,4
Mexico	29,5
New Zealand	11,0
Norway	n.a
Pakistan	28,3
Philippines	53,5
South Africa	34,5
Switzerland	n.a
Thailand	48,0
Turkey	25,0
United States	17,7

n.a. = not available

Note: For a detailed discussion of the STRI see Borchert, Gootiz and Mattoo (2012).

Source: Services Trade Restrictions Database, 2012, http://iresearch.worldbank.org/servicestrade/

Figure 3.1

Correlation between Tarrif Equivalent Barrier (TEB) and Services Trade Restrictiveness Index (STRI)

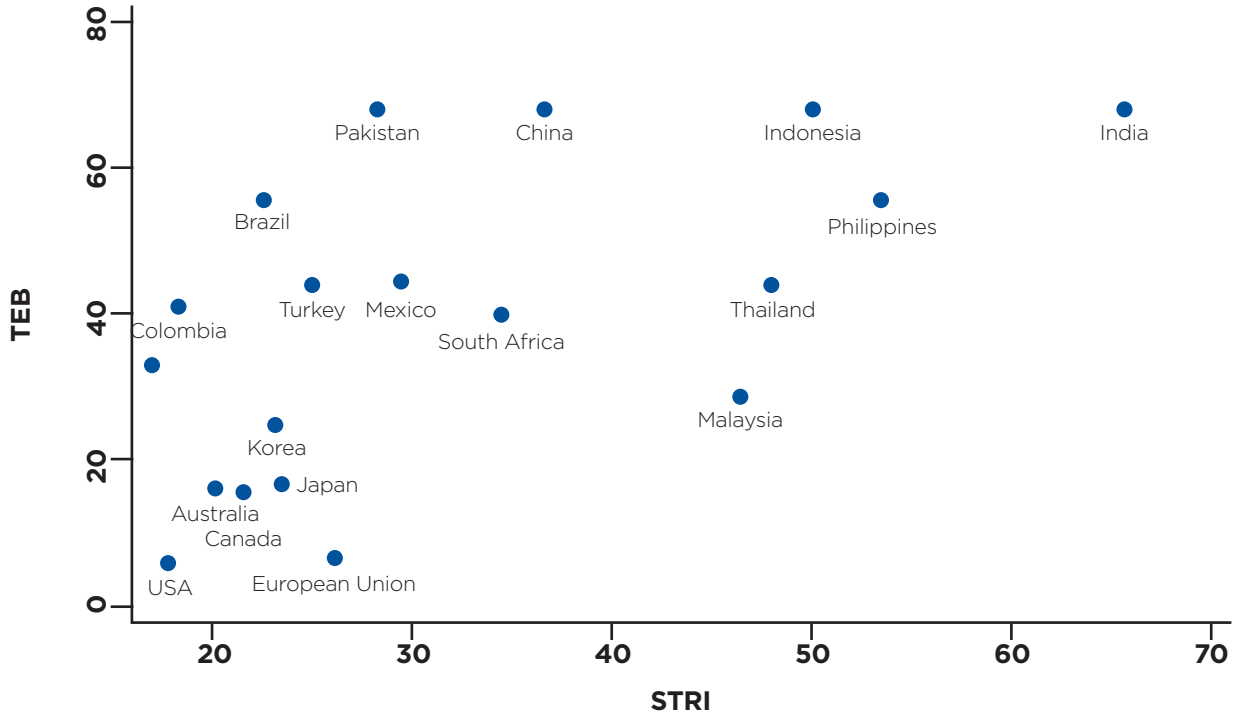

Table 3.4

Estimated export gains from liberalization of services trade, 2010

Country	GDP ($ billions)	Financial intermediation, real estate, rental, and business activities[1] (percent of GDP)	Estimated value added in tradable services[2] ($ billions)	Estimated export gains[3] ($ billions)
Australia*	1 132	32	356	21
Austria	377	24	90	5
Belgium	467	30	142	8
Canada*	1 577	26	410	25
Chile	216	21	45	3
Czech Republic	198	18	36	2
Denmark	312	27	84	5
Estonia	19	24	4	0
Finland	236	24	57	3
France	2 549	34	867	52
Germany	3 259	30	993	60
Greece	299	20	61	4
Hungary	129	23	30	2
Iceland*	13	37	5	0
Ireland*	205	28	57	3
Israel*	217	28	61	4
Italy*	2 044	28	580	35
Japan*	5 488	28	1 534	92
Korea	1 014	19	193	12
Luxembourg	53	51	27	2
Mexico*	1 036	21	216	13
Netherlands	774	28	215	13
New Zealand*	142	30	43	3
Norway	418	20	82	5
Poland	470	18	85	5
Portugal	227	23	52	3
Slovak Republic	87	19	17	1
Slovenia	47	23	11	1
Spain	1 383	23	316	19
Sweden	462	25	113	7
Switzerland	529	23	121	7
Turkey	731	22	162	10
United Kingdom	2 252	34	758	45
United States*	14 447	34	4 937	296
OECD total	42 811	30	12 760	766
Rest of world total	20 325	n.a.	n.a.	363
World[4] total	63 136	n.a.	n.a.	1 129

n.a. = not available

1 Activity category based on the ISIC Rev. 3 industrial classification system.

2 Financial and business services are used as a narrowly defined estimate of tradable services. The broad services categories that are reported to facilitate country comparison often create overlap with non-tradable service activities, making it difficult to accurately estimate tradable services. On the other hand, data on financial and business services underestimates the magnitude of tradable services, as the data does not include tradable activities such as in the information industry.

3 Export gains are calculated using an export-to-sales ratio of 0.06, the estimated increase in exports-to-sales if policy impediments to business services trade were eliminated. For a more detailed explanation see Hufabauer, Jensen, and Stephenson (2012).

4 World export gains are estimated by scaling world GDP to the ratio between OECD export gains and OECD GDP.

Note: Countries marked with an asterik indicate data for 2009, with the exception of Canada and New Zealand with data for 2007.

Sources: GDP data from World Bank, World Development Indicators database; services value added data from OECD, dataset National Accounts at a Glance, 2011; export gains from authors' calculations.

Table 3.5

Estimated jobs supported from liberalization of services trade, 2010

Country	Value added in tradable services ($ billions)	Employees in tradable services[1] (thousands)	Employees per billion US$ value added in tradable services	Estimated export gains ($ billions)	Estimated job gains (thousands)
Australia*	356	1 712	4 802	21	103
Austria	90	478	5 294	5	29
Belgium	142	800	5 655	8	48
Canada*	410	2 444	5 960	25	147
Chile	45	573	12 828	3	34
Czech Republic	36	357	9 809	2	21
Denmark	84	253	3 029	5	15
Estonia	4	41	9 053	0	2
Finland	57	220	3 865	3	13
France	867	3 759	4 337	52	226
Germany	993	3 511	3 537	60	211
Greece	61	337	5 499	4	20
Hungary	30	251	8 378	2	15
Iceland*	5	18	3 919	0	1
Ireland*	57	286	4 973	3	17
Israel*	61	488	8 019	4	29
Italy*	580	2 234	3 851	35	134
Japan*	1 534	4 700	3 064	92	282
Korea	193	2 207	11 431	12	132
Luxembourg	27	102	3 771	2	6
Mexico*	216	1 671	7 724	13	100
Netherlands	215	757	3 529	13	45
New Zealand*	43	326	7 527	3	20
Norway	82	213	2 584	5	13
Poland	85	1 041	12 196	5	62
Portugal	52	272	5 189	3	16
Slovak Republic	17	289	17 278	1	17
Slovenia	11	72	6 599	1	4
Spain	316	1 396	4 423	19	84
Sweden	113	516	4 547	7	31
Switzerland	121	622	5 141	7	37
Turkey	162	763	4 721	10	46
United Kingdom	758	3 286	4 335	45	197
United States*	4 937	24 318	4 926	296	1 459
OECD total	12 760	58 599	4 592	766	3 619
Rest of world total[2]	n.a.	n.a	13 777	363	5 008
World total	n.a.	n.a	n.a.	1 129	8 627

n.a. = not available

1 For countries reporting by the ISIC Rev. 3 industrial classification system, includes employment in Financial intermediation (Section J, Divisions 65 - 67); and Real estate, renting and business activities (Section K, Divisions 70 - 74). For countries using the ISIC Rev. 4 industrial classificaion system, includes employment in Financial and insurance activities (Section K, Divisions 64 - 66); Real estate activities (Section L, Division 68); and Professional, scientific, and technical activities (Section M, Divisions 69 - 75).

2 Rest of world employees per billion US$ value added in tradable services is estimated as triple the amount for OECD countries, since the developing country ratio of employees per billion US$ services value added is on average 3 times the developed country ratio.

Notes:

Asteriks indicate countries for which 2010 data was not available, in which case the most recent data available was used. OECD employment data was available for all countries except the United States; US 2010 employment data sourced from US Bureau of Labor Statistics, Employment by major industry sector, 2012.

Sources: Value added and employment data from OECD National Accounts at a Glance 2011 and OECD Annual Labour Force Statistics (ALFS) database; jobs supported from authors' calculations.

Table 3.6

Estimated GDP increase from liberalization of services trade (billions of dollars)

Country	Estimated export gains	Two-way trade gains[1]	GDP increase[2]
Australia*	21	43	20
Austria	5	11	5
Belgium	8	17	8
Canada*	25	49	23
Chile	3	5	2
Czech Republic	2	4	2
Denmark	5	10	5
Estonia	0	1	0
Finland	3	7	3
France	52	104	48
Germany	60	119	55
Greece	4	7	3
Hungary	2	4	2
Iceland*	0	1	0
Ireland*	3	7	3
Israel*	4	7	3
Italy*	35	70	32
Japan*	92	184	85
Korea	12	23	11
Luxembourg	2	3	1
Mexico*	13	26	12
Netherlands	13	26	12
New Zealand*	3	5	2
Norway	5	10	5
Poland	5	10	5
Portugal	3	6	3
Slovak Republic	1	2	1
Slovenia	1	1	1
Spain	19	38	17
Sweden	7	14	6
Switzerland	7	15	7
Turkey	10	19	9
United Kingdom	45	91	42
United States*	296	592	272
OECD total	766	1 531	704
Rest of world total	363	727	334
World total	1 129	2 258	1 039

1 Two-way trade gains calculated as double the amount of exports.

2 Following the methodology in Appendix A, to calculate GDP increase, an average dollar ratio of 0.46 is applied to two-way trade.

Note: Asteriks indicate countries for which 2010 data was not available, in which case the most recent data available was used.

Source: Authors' calculations.

Table 4.1

Members of the Information Technology Agreement (ITA)[1]

Original members	Additional members
Australia	Albania
Canada	Bahrain
Cost Rica	Bulgaria
Czech Rebpulic	China
El Salvador	Colombia
EU-15[2]	Croatia
Estonia	Dominican Republic
Hong Kong	Egypt
Iceland	El Salvador
India	EU-15[4]
Indonesia	Georgia
Israel	Guatemala
Japan	Honduras
Korea	Jordan
Macao	Kuwait
Malaysia	Kyrgyz Republic
New Zealand	Mauritius
Norway	Moldova
Philippines	Morocco
Poland	Nicaragua
Romania	Oman
Singapore	Panama
Slovak Republic	Peru
Switzerland[3]	Saudi Arabia
Taipei	Ukraine
Thailand	United Arab Emirates
Turkey	
United States	

1 Members as of May 2012.

2 Includes: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, United Kingdom.

3 Switzerland joined on behalf of the customs union between Switzerland and Liechtenstein.

4 Includes the EU-15 countries plus Bulgaria, Cyprus, Latvia, Lithuania, Slovenai, Hungary and Malta.

Source: WTO, 2012, http://wto.org

Table 4.2

Top 20 exporters and importers of IT products in 2010

Exports			Imports		
Country	**Value** ($ billions)	**Share of world exports** (percent)	**Country**	**Value** ($ billions)	**Share of world imports** (percent)
China	386,5	27,5	EU-27	387,0	25,0
EU-27	267,4	19,0	China	291,7	18,8
United States	133,6	9,5	United States	222,0	14,3
Singapore	122,5	8,7	Singapore	86,7	5,6
Taipei	100,6	7,2	Japan	69,1	4,5
Korea	97,9	7,0	Taipei	56,5	3,6
Japan	84,5	6,0	Mexico*	54,5	3,5
Malaysia	60,5	4,3	Korea	54,5	3,5
Mexico*	37,5	2,7	Malaysia	50,2	3,2
Thailand	31,3	2,2	Thailand	26,9	1,7
Philippines	29,2	2,1	Canada	25,7	1,7
Canada	9,6	0,7	Philippines	18,8	1,2
Israel	6,8	0,5	India	16,7	1,1
Switzerland	5,2	0,4	Brazil*	16,4	1,1
Vietnam	5,0	0,4	Russia*	15,8	1,0
India	4,3	0,3	Australia	15,5	1,0
Indonesia	3,9	0,3	Hong Kong	14,1	0,9
Norway	3,2	0,2	UAE	12,6	0,8
UAE	2,6	0,2	Indonesia	11,5	0,7
Australia	1,9	0,1	Switzerland	8,7	0,6
Total	1 394,0	99,1	Total	1 454,9	94,0
ITA member total	1 356,5	96,5	ITA member total	1 368,2	88,4
World total	1 406,0	100,0	World total	1 548,0	100,0

UAE = United Arab Emirates

ITA = Information Technology Agreement

Notes:

1. 'IT products' include only those products covered by the ITA. IT products that are grouped together with other non-IT products in tariff and trade classifications are excluded.
2. An asterisk indicates the country is a non-ITA member. All other countries are ITA members.
3. Switzerland represents the customs union between Switzerland and Liechtenstein.

Source: World Trade Organization, 2012, http://wto.org.

Table 4.3

Trade gains from the Information Digital Economy Agreement proposal, 2010 (billions of US dollars)

	ITA countries										
	China		European Union		India		Japan		United States		Total two-way trade
	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	
Current trade[1]	311,1	172,4	109,5	232,1	6,1	24,8	108,0	64,8	76,6	192,0	1 297,4
Trade gains											
Product expansion[2]	55,9	14,7	21,1	27,1	1,2	2,4	12,7	13,6	10,0	40,2	198,9
Country expansion[3]	12,4	4,7	17,2	-5,0	0,3	-0,6	2,6	0,5	16,0	26,4	74,5
Computer and related services[4]	6,3	3,2	34,9	14,9	49,4	34,2	0,9	3,9	12,9	16,1	176,7
Telecommunication services[4]	1,6	1,5	13,7	14,1	2,4	1,0	0,7	1,1	9,5	7,8	53,4
Trade gains total	76,2	24,1	86,9	51,1	53,3	37,0	16,9	19,1	48,4	90,5	503,5

	Non-ITA countries												
	Argentina		Brazil		Chile		Mexico		Russia		South Africa		Total two-way trade
	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	
Current trade[5]	0,1	3,1	1,1	14,2	0,1	2,4	36,1	48,1	1,0	14,2	0,5	6,7	127,6
Trade gains													
Product expansion	0,0	0,7	0,4	2,2	0,0	0,6	25,2	6,4	0,6	3,5	0,1	1,3	41,0
Country expansion	0,1	1,2	1,3	0,5	0,0	0,5	0,6	0,3	0,0	0,1	0,0	0,1	4,7
Computer and related services	12,6	16,1	12,6	16,1	12,6	16,1	12,6	16,1	n.a.	n.a.	n.a.	n.a.	114,8
Telecommunication services	9,5	7,8	9,5	7,8	9,5	7,8	9,5	7,8	n.a.	n.a.	n.a.	n.a.	69,2
Trade gains total	22,2	25,8	23,8	26,6	22,1	25,0	47,9	30,6	0,6	3,6	0,1	1,4	229,8

1 Trade among ITA countries under the current ITA product list.

2 Trade of ITA goods with ITA countries under the expanded ITA list of products.

3 Country expansion includes all six non-ITA countries: Argentina, Brazil, Chile, Mexico, Russia and South Africa.

4 Trade expansion from including these services in an ITA agreement.

5 Trade with ITA countries under the current ITA product list.

Notes:

Total two-way trade includes exports and imports for all countries in each respective category (ITA countries and non-ITA countries).

Including computer and telecommunications services in the expanded ITA is assumed to have the same effect on all non-ITA countries.

Source: ECIPE (2011).

Table 4.4

Estimated jobs supported from the IDEA proposal

Country	Export gains[1] ($ billions)	Employees per billion US$ value added in industry[2]	Estimated job growth from product expansion (thousands)	Estimated job growth from country expansion (thousands)	Estimated total job growth (thousands)
ITA countries					
China	68,3	41 500	2 319,9	514,6	2 830,0
European Union	38,3	5 500	116,1	94,6	211,0
India	1,5	122 500	147,0	36,8	184,0
Japan	15,3	5 500	69,9	14,3	84,0
United States	26,0	5 500	55.0[3]	88,0	143,0
Non-ITA countries					
Argentina	0,1	9 750	0,3	1,0	1,0
Brazil	1,7	9 750	3,9	12,7	17,0
Chile	0,0	9 750	0,1	0,3	0,4
Mexico	25,8	9 750	245,7	5,9	252,0
Russia	0,6	21 500	13,4	0,1	13,5
South Africa	0,1	17 250	1,7	0,5	2,0
Total	177,8	–	2 917,9	768,6	3 737,9

IDEA = Information Digital Economy Agreement proposal

1 Calculated as the sum of exports from product expansion and country expansion as part of the trade gains from the IDEA proposal, from table 4.3.

2 Aggregate regional values are applied to each country; based on the World Bank region designation (see Appendix, table A.1).

3 A study conducted by the ITIF (see Ezell 2012) found similar results, estimating that ITA expansion of product coverage would lead to 60,000 US jobs.

Sources: Exports from ECIPE (2011); employees per value added calculated from World Bank World Development

Indicators database and International Labor Organization (ILO), Global Employment Trends, 2012; jobs supported from authors' calculations.

Table 4.5

Estimated GDP increase based on estimated trade gains from the IDEA proposal
(billions of dollars)

Country	Export gains[1]	Import gains	Two-way trade gains[2]	GDP gains[3]
ITA countries				
China	68,3	19,4	87,7	40,3
European Union	38,3	22,1	60,4	27,8
India	1,5	1,8	3,3	1,5
Japan	15,3	14,1	29,4	13,5
United States	26,0	66,6	92,6	42,6
Non-ITA countries				
Argentina	0,1	1,9	2,0	0,9
Brazil	1,7	2,7	4,4	2,0
Chile	0,0	1,1	1,1	0,5
Mexico	25,8	6,7	32,5	15,0
Russia	0,6	3,6	4,2	1,9
South Africa	0,1	1,38	1,5	0,7
ITA member total	149,4	124,0	273,4	125,8
Non-ITA member total	28,4	17,4	45,8	21,1
Total	177,8	141,4	319,2	146,8

IDEA = Information Digital Economy Agreement

1 Export gains calculated as the sum of exports from product expansion and country expansion as part of the trade gains from the IDEA proposal, from table 4.3

2 Calculated as the sum of exports and imports for each country, from table 4.3.

3 Calculated using the average dollar ratio of 0.46 from table A.3. See Appendix A for an explanation of the methodology for calculating GDP increases.

Sources: Trade data from ECIPE (2011); GDP increases from authors' calculations.

Box 4.1

Tariff revenue implications of e-commerce

Mattoo, Perez-Esteve and Schuknecht (2001) estimate the tariff revenue implications if all software and "digitisable" media product were traded electronically. The authors first examine existing tariff rates applied to software and digitisable media products. They find that the tariff revenue is relatively low. Of the 29 countries sampled, roughly 60 percent apply a weighted average tariff of less than 10 percent. What's more, the estimated tariff revenue collected on software and digitisable media products from the sample countries was $850 million, just 0.80 percent of total import duties and 0.03 percent of total fiscal revenue for the selected countries. This implies that if trade in software and digitisable media is all moved online, there would not be a substantial revenue loss. The results vary between countries; the United States would lose 0.00 percent of its total fiscal revenue, while China would lose around 0.95 percent of its total fiscal revenue. The authors also examine the potential revenue from applying tariffs to IT trade in 1999 that takes place electronically. The authors find that if a 5 percent tariff was levied against electronic services trade in 1999, the associated tariff revenue would be $17.5 billion, which is 0.5 percent of total world tax revenue.

Source: Mattoo, Perez-Esteve and Schuknecht (2001).

Table 5.1

UN-designated least developed countries (LDCs)

Afghanistan	Liberia
Angola	Madagascar
Banglasdesh	Malawi
Benin	Mali
Bhutan	Mauritania
Burkina Faso	Mozambique
Burundi	Myanmar
Cambodia	Nepal
Central African Republic	Niger
Chad	Rwanda
Comoros	Samoa
Democratic Republic of Congo	Sao Tome & Principe
Djibouti	Senegal
East Timor	Sierra Leone
Equatorial Guinea	Solomon Islands
Eritrea	Somalia
Ethiopia	Sudan
The Gambia	Tanzania
Guinea	Togo
Guinea-Bissau	Tuvalu
Haiti	Uganda
Kiribati	Vanuatu
Lao PDR	Yemen
Lesotho	Zambia

Note: There are 48 LDCs in total; 33 in Africa, 14 in Asia and the Pacific, and 1 in Latin America according to UN broad regional classifications.

Source: United Nations, 2012, http://www.unohrlls.org/

Table 5.2

Improving DFQF market access for LDCs in OECD countries

Year	Country & program	Product coverage
2001	United States, African Growth and Opportunity Act[1]	Varies up to 98%
2001	European Union, Everything but Arms (EBA)	100% phased in by 2010 (arms and ammunitions excluded)
2001	New Zealand	100% immediate DFQF
2002	Norway[2]	100% immediate DFQF
2002	Iceland	Expanded but not 100%
2003	Australia	100% immediate DFQF
2003	Canada[3]	98.9% immediate (quota-controlled dairy, poulty, eggs excluded)
2005	Turkey implements EBA	100% phased in by 2010
2007	Japan	98% immediate (rice, sugar, fish, leather products excluded)
2007	Switzerland	100% phased in by 2010
2008	South Korea	Presidential decree providing duty-free access for LDCs expanded to 85%; 95% to be phased in by 2012

OECD = Organization for Economic Cooperation and Development

DFQF = Duty-free quota-free

1 Only sub-Saharan African countries are eligible.

2 In 2008, the Norwegian program also expanded DFQF market access outside of LDCs to 14 low income countries with populations less than 75 million.

3 Includes provisions for substantially simplied rules of origin.

Note: For a more comprehensive table of existing preference schemes of both developed and developed countries see Annex table 6 from WTO (2012), WT/COMTD/LDC/W/56.

Source: Elliot (2009).

Table 5.3

Leading merchandise exports of LDCs, 2011 (millions of dollars and percentage)

		LDC exports				
HS 2007 chapter code	Product description	Export value	Exports to developed economies	Exports to developing economies	Share of total LDC exports	Share of world exports
27	Mineral fuels, mineral oils and products of distillation; bituminous substances; mineral waxes	97 382	37 821	78 858	59,4	3,7
61	Articles of apparel and clothing accessories, knitted or crocheted	14 493	13 541	708	8,8	9,0
62	Articles of apparel and clothing accessories, not knitted or crocheted	11 435	10 476	813	7,0	7,0
74	Copper and articles thereof	6 930	552	6 378	4,2	4,3
26	Ores, slag, and ash	5 718	1 804	3 796	3,5	2,1
3	Fish and crustaceans, molluscs, and other acquatic invertebrates	2 491	1 375	1 088	1,5	3,1
76	Aluminium and articles therof	1 452	1 377	73	0,9	1,1
9	Coffee, tea, mate and spices	2 508	1 755	702	1,5	6,1
71	Natural or cultural pearls, precious or semi-precious stones, precious metals, metals clad with precious metal, and articles therof; imitation jewellery, coin	3 008	1 972	1 034	1,8	0,8
44	Wood and articles of wood; wood charcoal	1 904	164	1 737	1,2	1,9
24	Tobacco and unmanufactured tobacco substitutes	1 137	636	271	0,7	3,4
12	Oil seeds and oleaginous fruits; miscellaneous grains, seeds and fruit; industrial or medicinal plants; straw and fodder	911	181	727	0,6	1,3
64	Footwear, gaiters; parts of such articles	1 136	1 005	111	0,7	1,2
28	Inorganic chemicals; organic or inorganic compounds of precious metals, rare-eath metals, radioactive elements or isotopes	848	554	48	0,5	0,7
81	Other base metals; cermets	659	173	486	0,4	3,7
52	Cotton	1 352	140	1 209	0,8	2,8
63	Other made up textile articles; sets; worn clothing and worn textile articles; rags	911	774	122	0,6	2,2
40	Rubber and articles thereof	817	321	465	0,5	0,4
53	Other vegetable textile fibres; paper yarn and woven fabrics of paper yarn	384	81	272	0,2	13,9
99	Commodities not specified according to kind	448	432	15	0,3	0,2
Total	All listed commodities	155 925	75 134	79 616	95,1	3,2
Total	All commodities	163 958	78 858	83 364	100,0	1,0

HS = Harmonized System

LDCs = least developed countries

Note: For a more detailed breakdown of products at the HS 4 digit level see WTO (2012), Annex table 3.

Source: WTO (2012), Annex table 3.

Table 5.4

CGE model results of exports and GDP increases in 2020 from implementing 100 percent DFQF market access for LDCs in two scenarios (percent change)

	Exports		GDP increases (volume)	
County/region	**DFQF in OECD only**	**DFQF in OECD plus emerging markets**	**DFQF in OECD only**	**DFQF in OECD plus emerging markets**
DFQF recipients				
Bangladesh	4,16	4,82	0,17	0,24
Ethiopia	1,35	2,24	0,21	0,31
Madagascar	-0,03	0,57	-0,01	0,04
Malawi	12,97	13,91	1,21	1,40
Mozambique	0,39	1,41	0,15	0,41
Rest of Africa[1]	0,08	0,22	0,02	0,05
Rest of Southeast Asia[2]	2,52	2,55	0,42	0,43
Senegal	1,16	9,38	0,15	0,92
Rest of world[3]				
Australia and New Zealand	-0,01	-0,02	0,00	0,00
Bolivia	-0,03	-0,04	0,00	0,00
Brazil	-0,03	0,00	0,00	0,00
Canada	-0,01	-0,01	0,00	0,00
Central America	0,14	0,14	0,00	0,00
China	-0,03	-0,02	0,00	0,00
EFTA4	0,01	0,00	0,00	0,00
European Union	-0,01	-0,01	0,00	0,00
India	-0,01	0,64	0,00	-0,02
Indonesia	-0,03	-0,03	-0,01	-0,01
Japan	0,00	0,00	0,00	0,00
South Korea	-0,09	-0,09	0,04	0,04
Mauritius	0,03	0,05	0,01	0,01
Mexico	-0,01	-0,01	0,00	0,00
Middle East and North Africa	0,01	0,00	0,00	0,00
Nigeria	0,01	-0,13	0,00	-0,05
Pakistan	-0,04	-0,06	0,00	-0,01
Paraguay	-0,04	-0,03	-0,02	
Philippines	-0,01	-0,02	0,00	0,00
Rest of Asia and Oceania	0,00	0,01	0,00	0,01
Rest of Eastern Europe	0,00	0,01	0,00	0,00
Rest of Latin America	-0,05	-0,04	-0,01	-0,01
South Africa	0,02	0,03	0,00	0,00
Sri Lanka	-0,01	-0,05	0,00	-0,01
Turkey	0,04	0,04	0,00	0,00
United States	0,03	0,04	0,00	0,00
Vietnam	-0,01	-0,01	0,00	0,00

CGE = computable general equilibrium

EFTA = European Free Trade Association

OECD = Organization for Economic Cooperation and Development

1 Contains a mix of African LDCs, as well as other low- and middle-income countries, making the effect on LDCs difficult to interpret cleanly.

2 Includes the LDCs Cambodia and Laos, as well as oil exporter Brunei.

3 'Rest of world' includes both preference-giving countries who may suffer some market disruption, as well as other developing countries who may suffer preference erosion from expanding preferences for LDCs.

4 EFTA includes Iceland, Liechtenstein, Norway and Switzerland.

Notes: Emerging markets include Brazil, China and India.

Source: Bouët et al. (2010), Annex table 3.

Table 5.5

Impact on production in selected preference-giving countries of moving to full DFQF market access for LDCs

Country & product	Percent change in production of selected goods[1]
Canada	
Animal products, meat	-0,01
Milk	-0,03
Japan	
Fish	-0,01
Rice	0,00
Sugar	-0,35
United States	
Sugar	0,01
Textiles	-0,45
Apparel	-0,13

DFQF = duty-free quota-free

LDCs = least developed countries

1 Product categories overlap but do not exactly coincide with products excluded from current preference programs for LDCs.

Note: For more detailed data showing percent changes in production volume by preference-giving country and sector see Bouët et al. (2010), table 5.

Source: Center for Global Development (2010), Annex table 2.

Table 5.6

Percent change in exports from expanding DFQF market access to full coverage for two models (percent change)

	DFQF provided in OECD markets only			DFQF provided in OECD plus Brazil, China, India		
	General Equilibrium		*Partial Equilibrium*	*General Equilibrium*		*Partial Equilibrium*
Selected LDCs	**97% product coverage**	**100% product coverage**	**Gains moving from 97% product coverage to 100%**	**97% product coverage**	**100% product coverage**	**Gains moving from 97% product coverage to 100%**
Bangladesh	0,06	4,16	28,96	0,15	4,82	38,55
Cambodia1	0,05	2,52	31,27	0,06	2,55	32,96
Ethiopia2	0,02	1,35	n.a.	0,22	2,24	n.a.
Madagascar	0,01	-0,03	-0,74	0,07	0,57	20,61
Malawi	0,01	12,97	215,08	0,02	13,91	240,41
Mozambique	0,00	0,39	16,29	0,01	1,41	128,11
Senegal	0,00	1,16	8,46	0,27	9,38	64,83
All WTO LDCs[2] (percent)	–	–	16,97	–	–	44,36
All WTO LDCs[2] (million dollars)	–	–	2 108	–	–	7 731

OECD = Organization for Economic Cooperation and Development

LDCs = least developed countries

"–" or n.a. = not applicable

1 In the general equilibrium analysis, the results are for a regional aggregate including Laos and Brunei, as well as Cambodia, which dominates the outcome.

2 In the partial equilibrium analysis, results are only presented for WTO members, including the 32 LDCs that were WTO members in 2008. Among 'Selected LDCS', Ethiopia is the only non-WTO country. Emerging markets in this model include South Korea and Mexico in addition to Brazil, China, and India.

Note: The partial equilibrium model produces estimates that are markedly higher than the results from the general equilibrium model. Partial equilibrium modeling takes into account only potential changes in demand for LDC products in the liberalizing countries once trade barriers are removed and not potential supply constraints in the exporting LDCs.

Source: Center for Global Development (2010), Annex table 1.

Table 5.7

Estimated jobs supported from expanding DFQF market access from 97 percent to full coverage of LDCs exports in OECD and emerging markets

LDC WTO member	Export gains[1]		Estimated employees per billion US$ value added in industry[2]	Estimated jobs supported
	Percent	Value (millions)		
Angola	1,8	115,9	36 000	4 172
Bangladesh	38,6	1 249,7	122 500	153 088
Benin	72,6	83,5	36 000	3 006
Burkina Faso	14,3	12,0	36 000	432
Burundi	0,5	0,2	36 000	7
Cambodia	33,0	668,4	41 500	27 739
Cape Verde	13,1	1,1	36 000	40
Central African Republic	21,2	4,0	36 000	144
Chad	3,6	17,2	36 000	619
Democratic Republic of Congo	1,3	3,4	36 000	122
Djibouti	48,8	2,0	12 500	25
Gambia	289,7	42,0	36 000	1 512
Guinea	18,7	59,4	36 000	2 138
Guinea Bissau	118,8	100,0	36 000	3 600
Haiti	41,7	145,4	20 000	2 900
Lesotho	0,3	1,3	36 000	47
Madagascar	20,6	89,2	36 000	3 211
Malawi	240,4	351,0	36 000	12 636
Maldives	26,5	25,5	122 500	3 124
Mali	4,0	19,8	36 000	713
Mauritania	4,3	6,4	36 000	230
Mozambique	128,1	141,3	36 000	5 087
Nepal	645,0	3 958,5	122 500	484 916
Niger	17,7	31,1	36 000	1 116
Rwanda	48,8	8,0	36 000	288
Senegal	64,8	167,9	36 000	6 044
Sierra Leone	174,1	43,7	36 000	1 573
Solomon Islands	7,1	5,7	41 500	237
Tanzania	72,3	301,1	36 000	10 840
Togo	29,4	20,8	36 000	749
Uganda	10,5	12,9	36 000	464
Zambia	10,1	42,1	36 000	15 156
Total	44,4	7 730,6	–	745 976

1 Export gains are drawn from the partial equilibrium model estimates. These gains represent the increase in LDC WTO member exports to select markets including developed markets: United States, Canada, Japan, Norway, Switzerland; and emerging markets: Brazil, China, India, South Korea, Mexico.

2 Aggregate regional values are applied to each LDC; based on the World Bank region designation for each country (see Appendix, table A.1).

Sources: Export gains from Laborde (2008), table 4; employees per value added calculated from World Bank World Development Indicators database and International Labor Organization (ILO), Global Employment Trends, 2012; jobs supported from authors' calculations.

Box 6.1

Examples of export subsidy practices

- Direct export subsidies contingent on export performance.
- The sale of non-commercial stocks of agricultural products for export at prices below comparable prices for such goods on the domestic market.
- Producer financed subsidies: example, government programs which require a levy on all production which is then used to subsidize the export of a certain portion of that production.
- Cost reduction measures such as subsidies to reduce the cost of marketing goods for export, including the cost of handling and international freight.
- Transport subsidies applied to exports only, like those designed to bring exportable products to one central point for shipping.
- Subsidies on incorporated products. For example, subsidies to wheat that are contingent on its incorporation in export products like biscuits.

Source: World Trade Organization, 2012, http://wto.org.

Table 6.1

WTO commitments on agricultural export subsidies, 1995 to 2000

Country	Number of commitments made	Total value of commitments ($ millions)	Committed reduction in value of subsidies (percent)
Australia	5	468	12%
Brazil	16	529	3%
Bulgaria	44	657	14%
Canada	11	2 348	11%
Colombia	18	2 101	2%
Cyprus	9	–	–
Czech Republic	16	1 045	14%
EU	20	66 530	7%
Hungary	16	591	21%
Iceland	2	124	9%
Indonesia	1	156	3%
Israel	6	308	3%
Mexico	5	4 076	3%
New Zealand	0	577	29%
Norway	10	614	18%
Panama	1	–	–
Poland	17	3 713	8%
Romania	13	–	n.a.
Slovak Republic	17	355	15%
South Africa	62	883	19%
Switzerland	5	1 798	13%
Turkey	44	3 956	13%
United States	13	5 288	13%
Uruguay	3	10	0%
Venezuela	72	193	3%
Total	426	96 320	10%

n.a. = not applicable

Notes:

1. A dash (–) means data for that country was not available.
2. The number of commitments made represents the number of agricultural goods for which a country agreed to cut subsidies. For example Iceland agreed to cut susidies to two categories of goods: rice and meat products.
3. The value of commitments refers to the maximum value of permitted export subsidies.

Sources: Hoekman and Messerlin (2006); and WTO Background paper by the Secretariat, 2002, TN/AG/S/8.

Table 6.2

Reciprocity measure of gains from eliminating agricultural export subsidies
(millions of US dollars)

	Concession given by:				
Concessions given to:	**Canada**	**European Union**	**Norway**	**Switzerland**	**United States**
Australia	3	363	5	11	3
Argentina	1	97	1	9	*
Brazil	*	197	1	8	1
Bulgaria	*	8	*	*	*
Canada	–	184	2	4	1
China	*	91	1	2	*
Colombia	*	16	*	1	*
European Union	8	–	18	43	7
Hong Kong	*	23	*	1	*
Iceland	*	*	*	*	*
India	*	43	*	1	*
Indonesia	*	6	*	3	*
Japan	*	16	*	1	*
Korea	*	11	*	*	*
Malaysia	*	18	*	12	*
Mexico	*	39	*	1	*
New Zealand	4	538	6	17	5
Norway	*	14	–	1	*
Pakistan	*	7	*	*	*
Philippines	*	6	*	1	*
Romania	*	3	*	*	*
Singapore	*	28	*	1	*
South Africa	*	31	*	1	*
Switzerland	*	63	2	–	*
Taiwan	*	6	*	*	*
Thailand	*	138	*	3	*
Turkey	*	14	*	1	*
United States	1	559	3	11	–
Memorandum					
Other developing countries	1	263	2	14	1
Least developed countries	*	11	*	1	*
Non-WTO countries	1	88	1	3	1
World	21	2 882	42	151	21

Notes:

1. An asterisk (*) represents a value that is positive but less than $0.5 million.
2. A dash (–) means not applicable.
3. Rows are countries receiving concessions through the elimination of export subsidies on their imports. Columns are countries giving concessions through the elimination of export subsidies on their exports.
4. Reciprocity measure is revenue equivalent of concessions on export subsidies.

Source: Hufbauer, Schott and Wong (2010).

Table 6.3

Export gains and GDP increases from eliminating agricultural export subsidies (millions of US dollars)

	Export gains		GDP increases	
Country group	**50 % reduction**	**Total elimination**	**50 % reduction**	**Total elimination**
Developed countries	738	1 935	2 532	5 535
Developing countries	1 529	3 214	(588)	(1 077)
Least developed countries	96	197	(56)	(110)
World	2 363	5 345	1 889	4 348

Notes:

1. GDP increases are calculated as the sum of changes in consumer and producer surplus and government revenue.
2. The 50 percent reduction scenario represents a 50 percent reduction in bound export subsidies, including export credits, which are treated as an additional export subsidy.
3. The country groups cover 175 countries, including the 15 EU countries individually. Developed countries are classified according to World Bank definitions, while least developed and developing use the United Nations definition.

Source: UNCTAD (2006).

Table 6.4

Estimated jobs supported from eliminating agricultural export subsidies

Country group	Export revenue gains from total elimination ($ millions)	Employees per billion US$ value added in industry[1]	Estimated jobs supported (thousands)
Developed countries	1 935	5 500	10,6
Developing countries[2]	3 214	38 500	123,7
Least developed countries[3]	197	37 000	7,3
World	5 345	–	141,7

"–" = not available

1 Regional values based on the World Bank region designations (see Appendix, table A.1).

2 Developing country employees per billion US$ value added in industry are estimated as seven times the employees for developed countries, since the developing country ratio of employees per billion US$ industry value added is on average seven times the developed country ratio.

3 According to the UN, the 48 LDCs classify into 3 broad regions: 33 in Africa, 14 in Asia and the Pacific, and 1 in Latin America. Least developed country employees per billion US$ value added in industry are estimated as a weighted average of the employees per billion US$ value by LDC region.

Sources: Export gains from UNCTAD (2006); employees per value added calculated from World Bank World Development Indicators database and International Labor Organization (ILO), Global Employment Trends, 2012; jobs supported from authors' calculations.

Table 6.5

Estimated GDP increases from eliminating agricultural export subsidies (millions of dollars)

Country group	Export revenue gains from total elimination	Two-way trade gains[1]	GDP increases[2]
Developed countries	1 935	3 870	1 780
Developing countries	3 214	6 428	2 957
Least developed countries	197	394	181
World	5 345	10 690	4 917

1 Calculated as double the amount of export gains.

2 Following the methodology in Appendix A, to calculate GDP increases, an average dollar ratio of 0.46 is applied to two-way trade.

Source: Authors' calculations.

Table 7.1

Implementation of export restriction during the 2006-2008 food crisis

Country	Export restriction
Argentina	Export ban on rice, except to Brazil; raised export tax on soybeans; imposed export tax on corn, wheat and beef
Bangladesh	Export ban on certain varieties of rice
Bolivia	Export ban on grain and meat products
Brazil	Temporary export ban on rice exports
Cambodia	Two month export ban on rice
China	Export ban on rice, maize; export quota on some grain powders; increase taxes on food exports; removal of VAT rebate for grain exports; provisional export tax on grains and grain products; export duties on wheat, barley, oats
Ecuador	Export restrictions
Egypt	Export ban on rice
Ethiopia	Export ban on certain cereals; ban on grain stockpiling; suspension of World Food Program's local purchases for emergency interventions
India	Export ban on maize, some varieties of wheat, oils, milk powder
Indonesia	Only the state procurement agency is allowed to sell overseas, when national stock are above certain threshold and domestic price below government target price
Iran	Export tax on World Food Program purchases
Kazakhstan	Export ban on wheat, sunflower seeds; export tariffs on cereals
Madagascar	Export ban on rice
Malaysia	Exports of flour allowed only with special license
Nepal	Export ban on rice and wheat
Pakistan	Export ban on wheat sold by private companies; 35% export tariff on wheat and wheat products
Russia	Increased export tariff on wheat from 10% to 40%
Tanzania	Ban on the re-export of rice; export ban on other agricultural commodities
Thailand	Export ban on rice
Vietnam	Export ban on rice
Zambia	Export ban of any new maize contracts

Source: Bouët and Debucquet (2010).

Table 7.2

Agricultural exports, 2011

Country	Argicultural exports ($ millions)[1]	Share of world exports (percent)
Argentina	9 193	5,70
Bangladesh	6	0,00
Bolivia	59	0,04
Brazil	5 201	3,23
Cambodia	75	0,05
China	1 120	0,69
Ecuador	30	0,02
Egypt	271	0,17
Ethiopia	27	0,02
India	5 769	3,58
Indonesia	58	0,04
Iran	298	0,19
Kazakhstan	2 416	1,50
Madagascar	1	0,00
Malaysia	28	0,02
Nepal	1	0,00
Pakistan	4 394	2,73
Russia	4 645	2,88
Tanzania	n.a	n.a
Thailand	10 912	6,70
Vietnam	6 496	4,03
Zambia	101	0,06
Total	51 102	31,70

n.a. = not available

1 Includes cereal, wheat, maize and rice.

Source: FAOSTAT, 2012, http://faostat3.fao.org/home/index.html#HOME

Table 7.3

Estimated cost of food export controls during the 2006 – 2008 food crisis

Commodity	World imports MY 2011/2012[1] (million mt)	World price in 2011[2] (current US dollars/mt)	Estimated price increase from food export controls (percent)[3]	Estimated cost increase from food export controls (current US dollars/mt)	Estimated cost to importing countries from higher prices for two years (millions)
Maize (corn)	98	292	8	315	4 579
Rice	35	543	51	820	19 385
Wheat	148	316	23	389	21 513
Total	281	–	–	–	45 477

mt = metric tons

MY = marketing year

1 Aggregated based on local marketing year; MY 2011/2012 is a projected estimate.

2 World price is an annual average.

3 Based on experience in 2006 - 2008.

Sources: World imports data from US Department of Agriculture, World Agricultural Supply and Demand Estimates, October 2012; world price data from World Bank, Development Prospects Group, Commodity Price Data; percent price increase from Hoekman and Martin (2012) and Anderson and Nelson (2012).

Table 8.1

SETA List of Environmental Goods (EGs)

	HS code	HS code description
Products categorized as 'renewable energy' only from the WTO (2011)[1]		
1	390799	Other polyesters: Other
2	401699	Articles of vulcanised rubber nes, except hard rubber
3	470710	Recovered (waste & scrap) unbleached kraft paper/paperboard/corrugated paper
4	470720	Other paper or paperboard made mainly of bleached chemical
5	470730	Paper or paperboard made mainly of mechanical pulp (for example, newspapers, journals and similar printed matter)
6	470790	Waste, scrap of paper, board, nes
7	730820	Towers & lattice masts
8	840682	Other turbines of an output not exceeding 40 MW
9	841861	Other refrigerating or freezing equipment, heat pumps: Compression-type units whose condensers are heat exchangers
10	841869	Other refrigerating or freezing equipment, heat pumps: Parts
11	841919	Instantaneous or storage water heaters, non-electric: Other
12	847920	Machinery for the extraction or preparation of animal or fixed vegetable fats or oils
13	848340	Gears, gearing (excl. toothed wheels, chain sprockets, other transmission elements); ball or roller screws; gear boxes, other speed changers
14	848360	Clutches & shaft couplings (incl. universal joints)
15	850161	AC generators (alternators), of an output greater than 75 kVA
16	850162	AC generators (alternators), of an output exceeding 75 kVA but not exceeding 375 kVA
17	850163	AC generators (alternators), of an output exceeding 375 kVA but not exceeding 750 kVA
18	850164	AC generators (alternators), of an output exceeding 750 kVA
19	850231	Other generating sets: Wind-powered
20	850239	Other generating sets: other
21	850610	Primary cells & primary batteries, manganese dioxide
22	850630	Primary cells & primary batteries, mercuric oxide
23	850640	Primary cells & primary batteries, silver oxide
24	850650	Primary cells & primary batteries, lithium
25	850660	Primary cells & primary batteries, air-zinc
26	850690	Primary cells & primary batteries; parts
27	850720	Other lead -- Acid accumulators
28	850740	Nickel-iron
29	853710	For a voltage not exceeding 1,000 V
30	854140	Photosensitive semiconductor devices, including photovoltaic cells whether or not assembled in modules or made up into panels; light emitting diodes
31	900190	Prisms, mirros and optical elements nes
32	900290	Mounted lenses, prisms, mirros, optical elements, nes
Other Products[2]		
33	220710	Undenatured ethyl alcohol of an alcoholic strength
34	382490	Chemical preparations, allied; other[3]
35	841011	Hydraulic turbines and water wheels of a power not exceeding 1,000 kW
36	841090	Parts, including regulators
37	841181	Other gas turbines of a power not exceeding 5,000 kW
38	841182	Other gas turbines of a power exceeding 5,000 kW
39	850300	Parts suitable for use solely or principally with the machines of heading 85.01 or 85.02

nes = not elswhere specified
SETA = Sustainable Energy Trade Agreement
Notes:

1 The list of 32 EGs found under the sole category of 'renewable energy' come from the list found in the Annex II. A of the WTO (2011) plus 6 EGs selected by Hufbauer and Kim (2012) that are described both as 'renewable energy' and another category such as 'environmental technologies', plus un-denatured ethyl alcohol (HS 220710). The WTO (2011) reviewed all proposals of EGs of interest, put forward by the members, and presented a comprehensive list which covers 408 EGs at the HS six digit level.

2 Other products are selected based on authors' judgment. Except for HS 220710, all other products are also found in the WTO (2011) but labeled not only 'renewable energy' but also something else (e.g. 'environmental technologies').

3 There is currently no specific customs classification for biodiesel for biofuel production. Biodiesel is classified under HS code 382490 which covers some other products.

Table 8.2

Trade of 39 SETA EGs between selected countries, 2010 (millions of US dollars)

	Exports of SETA EGs to SETA	Imports of SETA EGs from world
Core countries		
Australia	478	2 967
Chile[1]	22	710
Colombia	44	477
EU-27	23 065	47 472
Japan	18 288	7 322
Korea[1]	5 740	9 653
NAFTA	16 406	35 351
New Zealand	90	287
Peru	23	417
Singapore	1 810	3 551
Candidate countries		
Brazil	1 436	2 776
China	31 373	31 543
India[1]	1 743	3 205
Indonesia	1 140	2 458
Turkey	388	3 242
South Africa	302	876
Total	102 349	152 307

SETA = Sustainable Energy Trade Agreement

1 Data for year 2009.

Note: Exports and imports are to/from one country to the other core and candidate countries.

Sources: Hufbauer and Kim (2012); UN Comtrade, 2011, http://comtrade.un.org.

Table 8.3

Tariff rates for 39 SETA EGs for select countries (percentages)

Country	MFN bound rates	MFN applied rates	Effective applied rates
Developed country members			
Australia	9,2	2,7	2,1
EU-27	11,5	4,6	2,3
Japan	1,5	0,5	0,3
Korea	6,5	5,6	5,6
NAFTA	7,1	2,0	1,4
New Zealand	16,1	3,3	2,9
Singapore	6,4	0,0	0,0
Developing country members			
Brazil	29,3	11,3	11,0
Chile	25,0	6,0	5,2
China	4,8	4,5	4,1
Colombia	36,9	9,7	8,5
India	33,3	9,0	8,9
Indonesia	37,1	5,3	2,2
Peru	30,0	2,1	1,9
South Africa	21,2	3,5	1,9
Turkey	14,1	2,7	0,4

SETA = Sustainable Energy Trade Agreement

Notes:

1. Tarrifs rates are a weighted average of all 39 EGS. Tariff data is from 2010, except for India where tariff data comes from 2009.

2. "Developed" and "developing" country status are taken from World Bank classifications.

Sources: Hufbauer and Kim (2012); World Bank, 2012, http://worldbank.org; TRAINS, accessed through World Integrated Trade Solutions, 2011, https://wits.worldbank.org

Table 8.4

APEC List of Environmental Goods (EGs)

	HS code[1]	HS code description
1	441872	Other assembled flooring panels, multilayer, of bamboo
2	840290	Stem or other vapour generating boilers; super-heated water boilers and parts
3	840410	Condensers for steam or vapour power units
4	840420	Auxiliary plant for steam or vapour generating boilers
5	840490	Steam, vapour generating boiler auxiliary plant parts
6	840690	Parts of steam and vapour turbines
7	841182	Gas turbine engines, nes of a power greater than 5,000 kW
8	841199	Parts of gas turbine engines, except turbo-jet/prop
9	841290	Parts of hydraulic/pneumatic/other power engines
10	841780	Industrial furnace, oven, incinerator non-electric, and parts thereof
11	841790	Parts of industrial or laboratory furnances and ovens
12	841919	Instantaneous or storage water heaters, non-electric, solar water heaters
13	841939	Non-domestic, non-electric dryers
14	841960	Machinery for liquefying air or other gases
15	841989	Machinery for the treatment of materials by temperature change, and parts nes
16	841990	Parts of machinery, laboratory, industrial heating and cooling machinery
17	842121	Water filtering or purifying machinery or apparatus
18	842129	Filtering or purifying machinery for liquids, other
19	842139	Filtering or purifying machinery for gases, other
20	842199	Parts for filtering or purifying machines for liquids or gases
21	847420	Machines to crush or grind stone, or and minerals
22	847982	Machines to mix, knead, crush, grind, etc, nes.
23	847989	Machines and mechanical appliances, nes
24	847990	Parts of machines and mechanical appliances nes
25	850164	AC generators or an output greater than 750 kVA
26	850231	Wind-powered generating sets, rotary convertors and equipment
27	850239	Electric generating sets, rotary convertors and biogas generator sets
28	850300	Parts for electric motors and generators
29	850490	Parts of electrical transformers and inductors
30	851410	Industrial or laboratory furnaces and ovens, electrical furnaces and ovens
31	851420	Furnaces and ovens functions by induction or dielectricl loss
32	851430	Industrial or laboratory electric furnaces and ovens, nes
33	851490	Parts of industrial or laboratory electric furnances and ovens or dielectric heating equipment
34	854140	Photosensitive, photovoltaic or LED semiconductor devices.
35	854390	Parts of electrical machines and apparatus nes
36	901380	Optical devices, appliances and instrusments nes
37	901390	Parts and accessories of optical devices, appliances and instruments nes
38	901580	Surveying instruments and appliances nes
39	902610	Instruments for measuring or checking the flow, level or pressures of liquids or gases
40	902620	Equipment to measure or check pressure of liquids or gases
41	902680	Equipment to measures and check or variables of gas or liquid nes
42	902690	Parts of equipment to measure and check pressure, level or pressure of liquids or gases
43	902710	Gas or smoke analysis apparatus
44	902720	Chromatographs and electrophoresis insturments
45	902730	Spectrometers, spectrophotometers and spectrographs using optical radiations
46	902750	Other instruments and apparatus using optial radiation
47	902780	Instruments and appartus for physical or chemical analysis nes
48	902790	Microtomes, parts of scientific analysis equipment
49	903149	Optical instruments and other measures and checking instruments nes
50	903180	Measuring or checking equipment nes
51	903190	Parts and access for measuring or checking equipment nes
52	903289	Automatic regulating or controlling equipment
53	903290	Parts and accessories for automatic controls
54	903300	Parts and accessories for optical or electrical instruments nes

nes = not elsewhere specified
APEC = Asia Pacific Economic Cooperation
HS = Harmonized System
1 The APEC List uses HS nomenclature from 2002, 2007 and 2012.
Source: APEC Leader's Declaration Annex C, September 8-9, 2012, http://apec.org

Table 8.5

Trade of APEC EGs, 2010[1] (millions of US dollars)

Country	Exports of APEC EGs to APEC	Imports of APEC EGs from World
Australia	916,7	5 530,5
Brunei Darussalam[2]	n.a	n.a
Canada	4 073,2	9 175,1
Chile	40,5	1 020,1
China	15 831,5	49 249,7
Hong Kong	109,8	9 077,2
Indonesia	223,1	3 206,4
Japan	37 065,0	13 353,3
Korea, Rep	9 455,5	24 432,6
Malaysia	2 968,8	5 040,3
Mexico	5 632,4	8 304,4
New Zealand	94,4	500,3
Papua New Guinea2	n.a	n.a
Peru	4,1	553,3
Philippines	273,4	1 275,2
Russia	185,7	7 182,7
Singapore	9 846,6	10 755,8
Taipei2	n.a	n.a
Thailand	1 667,5	4 662,9
United States	26 634,5	39 881,6
Viet Nam	195,7	1 993,4
Total	115 218,4	195 194,8

n.a. = not available

1 While the original APEC EG list contains 54 products at HS 6 digit levels, we only include 50 products (48 from the HS 2002 and 2 from HS 2007) here since 4 products identified in the APEC list are from the HS 2012 for which trade data is not available in UN Comtrade.

2 Trade data from HS 2002 not available.

Source: Hufbauer and Kim (2012).

Table 8.6

Estimated trade gains from an EGs agreement[1]

	Number of EG tariff lines covered[2]	Participating countries	Trade coverage (billions)[3]	Potential trade gains (billions of dollars)		
				PIIE estimates[4]	World Bank estimates	Average trade gains
APEC Green Growth Deal	54	21 APEC members	195,2	9,1	14,1	11,6
SETA initiative	39	10 core, 6 candidate countries	152,3	7,1	11,0	9,0

1 Trade gains are calculated using estimates from Hufbauer, Schott and Wong (2010) and the World Bank (2007). Both studies estimate the impact on trade from the elimination of tariffs on a select list of EGs. Although the lists of EGs used by Hufbauer, Schott and Wong (2010) and the World Bank (2007) differ from the APEC and SETA lists, we assume that the effects of eliminating tariffs are similar.

2 Refers to HS nomenclature at the six digit level.

3 Trade coverage and potential trade gains refer to EGs imports of the relevant countries from the world.

4 PIIE estimates refer to the work of Hufbauer, Schott and Wong (2010).

Sources: Hufbauer and Kim (2012); Hufbauer, Schott and Wong (2010); World Bank (2007); authors' own calculations.

Table 8.7

Estimated jobs supported of selected countries from an EGs agreement

	Export gains[1] ($ millions)			Estimated employees per billion US$ value added in industry[2]	Estimated jobs supported[3]
	Average SETA export gains	Average APEC export gains	Total average export gains		
Selected developed countries					
Australia	572	328	450	5 550	2 498
NAFTA3	176	3 402	1 789	5 550	9 929
Chile	28	60	44	5 550	244
Japan	25	792	408	5 550	2 264
Korea	211	1 449	830	5 550	4 607
New Zealand	2 096	30	1 063	5 550	5 900
Singapore	17	638	327	5 550	1 815
Selected developing countries					
China	1 871	2 921	2 396	41 500	99 434
Indonesia	146	190	168	41 500	6 972
Peru	434	33	1	20 000	20
Total developed countries	3 360	6 997	5 178	5 550	28 738
Total developing countries[5]	5 672	4 578	5 125	44 400	227 550
Total world	9 032	11 575	10 303	–	256 288

1 The number of imports from the world of SETA and APEC are taken from table 8.3 and table 8.5 respectively, and used as an approximation of the total number of exports to the world.

2 Jobs coefficients for each country are based on regional aggregate values (see Appendix, table A.1).

3 Estimated jobs supported based on the total average export gains.

4 NAFTA includes the United States, Canada and Mexico.

5 Developing country employees per billion US$ value added in industry are estimated as 8 times the employees for developed countries, since by region the developing country ratio of employees per billion US$ industry value added is on average 8 to 9 times the developed country ratio.

Notes:

Average export gains for SETA and APEC are calculated by averaging the trade gains estimates from Hufbauer, Schott and Wong (2010) based on a coefficient of 4.7 percent and the trade gain estimatse of the World Bank (2007) based on a coefficient of 7.2 percent.

Totals include all APEC members and all SETA core and candidate countries, see table 8.3 and 8.5 for a comprehensive list of all countries.

Sources: Hufbauer and Kim (2012); Hufbauer, Schott and Wong (2010); World Bank (2007); employees per value added calculated from World Bank World Development Indicators database and International Labor Organization (ILO), Global Employment Trends, 2012; jobs supported from authors' calculations.

Table 10.1

WTO Dispute Settlement System average period of resolution

Complainant	Respondent	Request for consultation	Request for establishment of a panel[1]	Panel report circulated	Number of days between request for consultation and the establishment of a panel	Numbers of days to resolve[2]
China	European Union	4-Feb-10	18-May-10	28-Oct-11	103	528
China	United States	14-Sep-09	9-Dec-09	13-Dec-10	86	369
China	European Union	17-Apr-09	23-Jun-09	29-Sep-10	67	463
United States	European Union	9-Mar-07	24-May-07	9-Jun-08	76	382
European Union	Canada	8-Nov-04	13-Jan-05	31-Mar-08	66	1 173
Brazil	United States	21-May-02	Jun-02	11-Jul-03	11	405
Japan	United States	30-Jan-02	4-Apr-02	14-Aug-03	64	497
India	United States	11-Jan-02	7-May-02	20-Jun-03	116	409
Canada	United States	17-Jan-01	23-Aug-01	15-Jul-02	218	326
Canada	United States	19-May-00	24-Jul-00	29-Jun-01	66	340
European Union	United States	4-Mar-99	11-May-99	17-Jul-00	68	433
United States	Korea	16-Feb-99	11-May-99	1-May-00	84	356
European Union	United States	25-Nov-98	26-Jan-99	22-Dec-99	62	330
Canada	European Union	28-May-98	8-Oct-98	18-Sep-00	133	711
United States	Ireland	14-Feb-97	25-Feb-97	5-Feb-98	11	345
Average					82,1	471,1

1 The request for establishment of a panel initiaties the phase of adjudication and is circulated to the entire WTO membership. The complainant may make a request 60 days after the respondent receives the request for consulation. A request may be made sooner than 60 days if the respondent does not respond to the request for consultation, or if the consulting parties consider that consulations have failed to settle the dispute.

2 Refers to the number of days between the request to establish a panel and the circulation of the panel report.

Source: World Trade Organization, 2012, http://wto.org

Table 10.2

WTO Appellate Body average period of resolution

Appellant	Appellee	Request for appeal	Appellate Body report circulated	Numbers of days to resolve[1]
China	United States	20-Jul-12	18-Oct-12	90
United States, Canada	United States, Canada	23-Mar-12; 28-Mar-12	29-Jun-12	96
United States, Mexico	United States, Mexico	20-Jan-12; 25-Jan-12	16-May-12	115
United States	Indonesia	5-Jan-12	4-Apr-12	90
Philippines, EU	Philippines, EU	23-Sep-11; 28-Sep-11	21-Dec-11	87
China, United States	China, United States	31-Aug-11; 6-Sep-11	30-Jan-12	149
China	United States	24-May-11	5-Sep-11	104
EU, United States	EU, United States	1-Apr-2011; 28-Apr-11	12-Mar-12	333
EU, China	EU, China	25-Mar-11; 30-Mar-11	15-Jul-11	110
Thailand	Philippines	22-Feb-11	17-Jun-11	115
China	United States	1-Dec-10	11-Mar-11	100
EU, United States	EU, United States	21-Jul-10; 19-Aug-10	18-May-11	287
Australia, New Zealand	Australia, New Zealand	31-Aug-10; 13-Sep-10	29-Nov-10	84
China, United States	China, United States	22-Sep-09; 5-Oct-09	21-Dec-09	84
Japan, United States	Japan, United States	11-Oct-06; 23-Oct-06	9-Jan-07	84
Average				129

1 The number of days to resolve refers to time between the appeal and when the Appellate Boday report was circulated.

Notes:

1. When both countries have submitted an appeal to the Appellate Body, the 'number of days to resolve' is an average of the number of days to resolve both appeals.

2. Article 17.5 of the WTO rules governing dispute settlement procedures states that "as a general rule, the proceedings shall not exceed 60 days" and "in no case shall exceed 90 days." However, the Appellate Body does have the right to delay issuing the report provided it informs the Dispute Settlement Body in writing before the 60 day period expires.

Source: World Trade Organization, 2012, http://wto.org.

Table A.1

Employees per billion US dollars of GDP in tradables, 2010

Country group	Total GDP (current US billions of dollars)	Value added in industry[2] (current US billions of dollars)	Employees in industry (millions)	Employees per billion US$ value added in industry[3]	Estimated employees per billion US$ in exporting firms (halved)
Developed economies[1]	42 808	9 884	105	11 000	5 500
Developing economies					
East Asia and the Pacific	7 630	3 486	289	83 000	41 500
Eastern Europe and Central Asia	3 059	900	39	43 000	21 500
Latin America and Caribbean	4 982	1 438	58	40 000	20 000
Middle East and North Africa	1 068	1 156	29	25 000	12 500
South Asia	2 090	518	127	245 000	122 500
Sub-Saharan Africa	1 097	364	26	72 000	36 000

1 Developed economies include the United States, Canada, the European Union, Japan, South Korea and other OECD members.

2 Value added in industry used as the best estimate of GDP from tradeables.

3 Rounded to nearest 1000. These values are halved for calculations of "jobs supported".

Note: Industry corresponds to International Standard Industrial Classification (ISIC) divisions 10-45 and includes manufacturing.

Sources: GDP and value added data from the World Bank, World Development Indicators database; employment data from International Labor Organization (ILO), Global Employment Trends, 2012; job coefficients from authors' calculations.

Table A.2

GDP per capita and employment share by region, 2010

Country group	GDP per capita (current US dollars)	Employment share of working population[1] (percent)	GDP per working person (GDP per capita / employment share)
Income level			
High income	38 229	55	69 046
OECD members	34 602	55	62 971
Middle income	3 957	60	6 589
Upper middle income	6 257	64	9 703
Lower middle income	1 676	55	3 048
Low income	532	71	750
LDCs	747	69	1 077
Region			
East Asia & Pacific	7 399	69	10 783
Developing only	3 894	70	5 573
Europe & Central Asia	22 435	53	42 497
Developing only	7 551	53	14 164
Latin America & the Caribbean	8 799	61	14 312
Developing only	8 650	62	14 032
Middle East & North Africa	6 585	43	15 282
Developing only	3 639	41	8 899
North America	46 660	58	80 601
South Asia	1 254	55	2 283
Sub-Saharan Africa	1 309	64	2 047
Developing only	1 293	64	2 023

OECD = Organization for Economic Cooperation and Development, LDCs = Least Developed Countries

1 Working population is considered the 15+ years of age.

Note: Upper middle income includes the BRIC countries of Brazil, China, and Russia.

Source: World Bank, World Development Indicators database.

Table A.3

Dollar ratios of GDP increase related to two-way trade increase, from regression and computable general equilibrium (CGE) models

Study	Covered trade (base year)	Model type	Dollar ratio
OECD (2003a)	Developed countries (2000)	Regression	0,48
Cline (2004)	Various developing countries	Regression	1,09
Freund and Bolaky (2008)	Global economic performance (2000)	Regression	0,75
Anderson, Martin, and van der Mensbrugghe (2006)	Global liberalization (2008)	CGE	0,13
Brown, Kiyota, and Stern (2005)	Free Trade Area of the Americas (FTAA) (1997)	CGE	0,91
Brown, Deardorff, and Stern (2001)	Uruguay Round (1995)	CGE	0,48
Decreux and Fontagne (2009)	Goods, services, and trade facilitation (2020)	CGE	0,37
Decreux and Fontagne (2008)	Goods and services (2025)	CGE	0,96
Francois, van Meijl, and van Tongeren (2005)	Doha Round (2001)	CGE	0,11
Gilbert (2009)	Uruguay Round (2004)	CGE	0,06
Gilbert (2009)	Transportation costs (2004)	CGE	0,39
Scollay and Gilbert (2001)	APEC liberalization (1995)	CGE	0,12
Lodefalk and Kinnmann (2006)	Doha Round (2001)	CGE	0,12
Simple average			**0,46**

APEC = Asia Pacific Economic Cooperation forum

OECD = Organization for Economic Cooperation and Development

Notes: The dollar ratio is the ratio of the dollar increase in GDP over the dollar increase in two-way trade. As an example, the dollar ratio in Decreux and Fontagne (2009), from their simulation of a liberalization scenario in goods and services trade as well as trade facilitation improvement, is 0.37. This number is the ratio between the dollar GDP growth in this scenario, $165 billion, and the related two-way trade growth, $452 billion. For more detailed explanations regarding data and calculations, see table A.1 in Hufbauer, Schott, and Wong (2010).

Sources: Hufbauer, Schott, and Wong (2010); in addition to the studies in the table, UN Comtrade Database, 2009, via World Integrated Trade Solution; IMF, World Economic Outlook, April 2009, www.imf.org.