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The potential cost of a failed Doha Round

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Abstract

This study offers new conclusions on the economic cost of a failed Doha Round. The first section is devoted to an analysis of how trade policies evolve in the long and medium runs. We show that even under normal economic conditions, policymakers modify tariffs to cope with the evolution of world markets. We then use the MIRAGE Computable General Equilibrium model to assess the potential outcome of the Doha Round, and then examine four protectionist scenarios. Under a scenario where applied tariffs of major economies increase up to the currently bound tariff rates, we find that world trade decreases by 7.7 percent and world welfare drops by US\$353 bn. We then compare a resort to protectionism when the Doha Development Agenda (DDA) is implemented versus a resort to protectionism when the DDA is not implemented. We find that this trade agreement could prevent the potential loss of US\$ 809 bn of trade, and could therefore act as an efficient multilateral insurance scheme against the adverse consequences of “beggar-thy-neighbor” trade policies.

JEL Classifications: F13; H26; K42

Keywords: Trade negotiations, CGE modeling, bound duties, domestic support

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1. INTRODUCTION

After seven years of negotiations, participants at the July 2008 mini-ministerial meeting of the World Trade Organization (WTO) in Geneva were unable to reach final agreement on the Doha Round liberalization modalities. Conflicts still exist over the commitments to be made by both developed and developing countries. For instance, the United States (US) is still reluctant to tackle the issue of domestic support to the cotton sector, while India and other developing countries want to avoid restrictions (e.g., the anti-concentration clause) on their ability to use flexibility in nonagricultural market access (NAMA) negotiations. Beyond these very specific disagreements, it seems that incentives to conclude the Doha Round are weak. Because large market access gains have already been achieved in the manufacturing sectors of developed-country markets (Martin and Messerlin 2007), the impetus that existed in previous multilateral negotiations has vanished. In addition, the remaining issues are more difficult to negotiate, the political costs are high, and the gains are more difficult to assess. For developed countries, liberalization of agricultural markets remains a highly complex issue. At the same time, developing countries want to maintain protection in manufacturing and avoid making new commitments regarding services based on nascent industry considerations. Finally, regional and bilateral liberalizations have reduced the market access gains expected by key players, fostering resistance to multilateral liberalizations that will erode existing preferences. Consequently, the longer the negotiations last, the weaker the incentives to conclude a successful round.

In parallel, impact assessments using a computable general equilibrium (CGE) model have provided increasingly accurate quantitative information concerning the gains and losses associated with the Doha Development Agenda (DDA). Great improvements have been made since the Uruguay Round assessment, where a lack of information on tariffs led to an overestimation of potential gains. However, improved information has shown that the gains from the Doha Round are likely to be lower than expected (Bouët 2008). The current models capture the fact that in most cases, applied tariffs are lower than their most favored nation (MFN)-bound level due to binding overhang (the gap between MFN bound and applied rates) and preferences (the gap between MFN and bilateral applied rates). In addition, the implementation of trade scenarios has become increasingly more precise, providing new detail and showing the existence of numerous flexibilities and exceptions that will limit the scope of liberalization (Jean, Laborde and Martin 2008).

The shrinking gains associated with the Doha Round have led both economists and policymakers to state that the real gains will go far beyond tariff-reduction effects and should be sought outside the standard model. For example, although gains in productivity, service liberalization, and trade facilitation may account for a large share of the positive effects of a successful round, they are only weakly represented in the CGE modeling exercises. Moreover, even if applied tariffs are not cut, the binding of tariff lines and reductions in the existing binding overhangs should have significant value in providing a more stable trade environment.

The goal of this study is not to uncover additional benefits associated with the DDA, but rather to re-examine the value of an agreement by considering potential gains and losses against a moving landscape of trade policies. Traditional impact studies have assessed the potential gains of the Doha negotiations by comparing the consequences of negotiation modalities with the status quo. Therefore, the cost of failed negotiations has been seen strictly as an opportunity cost representing unrealized gains. This approach, however, may underestimate the real losses that could be associated with failure of the DDA. Such a drastic

event would make the business-as-usual scenario uncertain because the status quo does not provide a long-term perspective on trade policies. The current trend of multilateral trade liberalization may not survive this failure; consequently, the global public good provided by the WTO—which helps to free trade in a stable and less-distorted environment—may vanish. This study therefore compares the effects of a DDA scenario with other relevant alternatives.

To this end, we examine six protectionist scenarios characterized by different approaches to the implementation of protectionism (multilateralism vs. regionalism vs. a combination of both approaches) at different orders of magnitude. Throughout the study, we take into account the commitments enforced through the current trading system, which limit the capacities of WTO members to impede international trade—in particular through binding border protection. As part of this study, we develop a new database of global trade protection for the period 1995-2006; this allows us to examine the degree to which tariff barriers have decreased since the creation of the WTO and to determine the maximum tariffs for the time period on which the study's protectionist scenario is based. We also use the MacMapHS6v2 database of applied and bound protection in 2004 to define another protectionist scenario characterized by the implementation of the highest protection authorized by the current multilateral system.

These tariff scenarios are implemented using a multicountry, multisector dynamic model called Modeling International Relationships in Applied General Equilibrium (MIRAGE), which was initially developed at Paris's Centre d'Etudes Prospectives et d'Informations Internationales (CEPII). This CGE model of the world economy enables us to evaluate the economic consequences of both cooperative and noncooperative outcomes. We find that the difference between cooperative and noncooperative scenarios represents a potential loss of US\$2,261 bn in trade (in constant terms) based on bound tariffs, and US\$1,170 bn based on the maximum tariffs implemented between 1995 and 2006.

To take another perspective, we then consider the WTO agreement as an insurance scheme against potential trade wars; to do this, we compare scenarios of protectionism with and without implementation of the DDA. Our findings show that this trade agreement could prevent the potential loss of US\$809 bn of trade and therefore acts as an efficient multilateral insurance scheme against the adverse consequences of “beggar-thy-neighbor” trade policies. The reference scenario has countries adopting bound duties; if, however, they adopt the highest tariffs implemented between 1995 and 2006, the insurance scheme is worth US\$581 bn. These new findings clearly reappraise the potential cost of a failed Doha Round. As stated by Pascal Lamy in his speech at the Lowy Institute (March 2, 2009; Sydney): “the Doha Round is the most effective way to further constrain protectionist pressures by reducing the gap between bound commitments and applied policies.”¹

The remainder of this paper is structured as follows: section 2 details our motivation for undertaking this study. Section 3 describes the utilized methodology. Section 4 presents the results of the various scenarios, both in terms of the level of border protection and in terms of the economic impact, and section 5 offers conclusions.

¹ See: <http://www.lowyinstitute.org/Publication.asp?pid=985>.

2. BACKGROUND

The purpose of this chapter is to provide a detailed background to the study. We undertake a new assessment of the Doha Round based on the most recent modalities, while also evaluating completely different trade scenarios intended to estimate the potential cost of a resort to worldwide protectionism. We believe that these latter scenarios are realistic for a number of reasons.

To begin, we consider the recent wave of protectionist and “beggar-thy-neighbor” policies adopted since early 2008 and conclude that there is no straightforward evidence indicating that the threat of trade wars has recently increased. Then, we examine historical data on world protectionism and find that trade policies offer a moving landscape, in both the medium- and long-terms. Finally, we review the economic literature and examine the rationale for these up-and-down variations in applied protection.

Has Protectionism Recently Increased?

It has often been stated that protectionism has risen among WTO members since September 2008, through a mix of increased MFN duties and nontariff barriers, and the proliferation of antidumping duties. Here are some examples of these new border measures, as told to us by WTO staff members:

- Argentina recently imposed nonautomatic licensing requirements on products such as auto parts, textiles, televisions, toys, shoes, and leather goods.
- India reportedly raised tariffs on some steel products in November 2008.
- On November 17, 2008, Mercosur member countries (Argentina, Brazil, Paraguay, and Uruguay) decided to raise their common external tariff by 5 percentage points on numerous items, including wine, peaches, dairy products, textiles, leather goods, and wooden furniture.
- On November 26, 2008, Ecuador raised its tariffs 5 to 20 percentage points on 940 products ranging from butter, turkey, crackers, and caramels to blenders, cell phones, eyeglasses, sailboats, building materials, and transport equipment.
- Russia (which is not a WTO member) has announced plans to raise import tariffs on cars and harvesters, and continues to impose Sanitary and Phyto-Sanitary (SPS) measures.
- The Ukrainian Parliament is considering raising applied tariffs.
- In December 2008, the Government of Indonesia implemented a regulation stating that imports on 500 individual tariff lines—including textiles, toys, and electronics— will require special licenses to be conditionally granted upon the approval of domestic producers.
- In December 2008, the Republic of Korea announced that its tariffs on the importation of crude oil would increase from 1 to 3 percent beginning in March 2009.
- The European Union announced its intention to re-introduce export subsidies for some dairy products as of late January 2009.

These are border measures, but numerous “bail-out” measures—apparently related to the banking and financial crisis—have also been adopted. On January 28, 2009, the US House of Representative introduced a “Buy American” provision under its stimulus plan, requiring that all public projects funded by the plan use only iron and steel produced in the

US. In early February 2009, the US Senate debated a provision to expand the requirement from iron and steel to all manufactured products. President Obama persuaded the Senate to water down the provision, which was passed as part of the stimulus package on February 10, 2009. However, the Berry Amendment was extended, stipulating that the Departments of Defense and Homeland Security must purchase military clothing and other uniform-destined textiles from US firms. US

Some of the plans recently implemented to help domestic industries or other service sectors hit by the economic crisis have been criticized as creating biased incentives for domestic firms. For example, a provision in the French plan aimed at funding the car industry was highly criticized because it required publicly funded firms to develop electric car-building capacities inside the national territory. The Indonesian plan to mitigate the effects of the global crisis includes measures that appear to favor domestic companies, such as a regulation containing a provision that all foreign drug importers must build a manufacturing plant within five years. Other examples include Italian subsidies to parmesan cheese producers, Swedish aid to Saab and Volvo, the Brazilian Central Bank's assistance to farming exporters, and the Chilean plan to help small exporters. All these measures, which in one way or another subsidize domestic firms, are questionable in terms of their compatibility with WTO law, especially if they survive the crisis (Bhagwati and Panagarya, in Baldwin and Evenett 2008). The WTO authorizes domestic subsidies that aim to restructure businesses, promote innovation, or assist displaced workers (Hufbauer and Schott, in Baldwin and Evenett 2008), but it is not always clear whether the use of these measures is linked to the financial crisis. All border measures are WTO-compatible, and some "bail-out" measures, if temporary, may be WTO-compatible. Hufbauer and Schott (2009) consider that "if the Buy American provisions are applied to signatory parties of the GPA or to NAFTA partners (Mexico and Canada), they would violate US obligations" (Hufbauer and Schott 2009, pg. 5).²

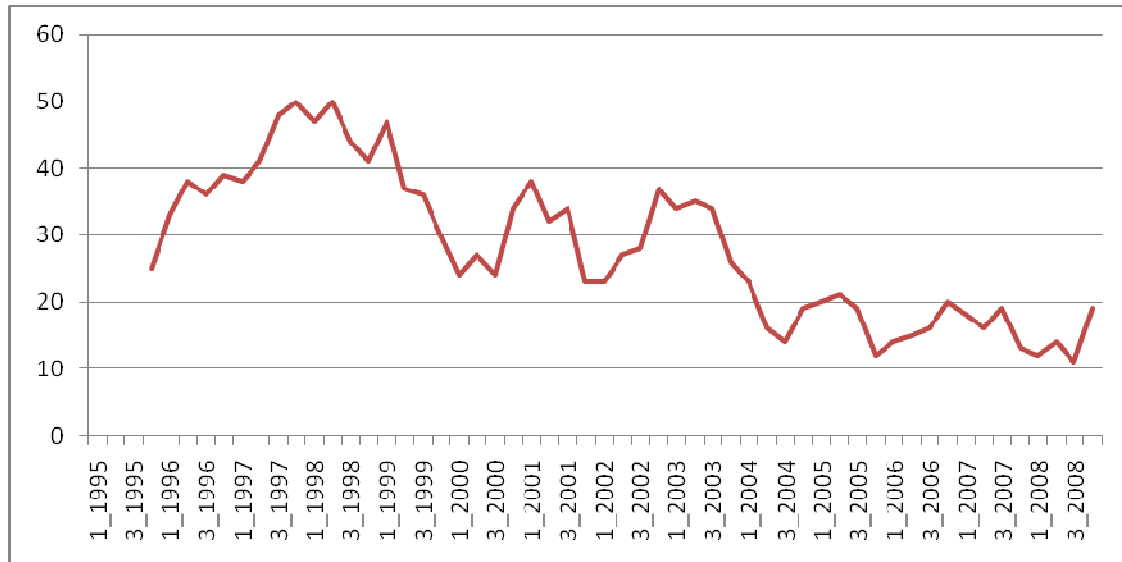
While "bail-out" and restructuring measures may be understood as attempts to circumvent the disastrous economic impact of the banking and financial crisis, we do not see a recent increase of "beggar-thy-neighbor" protectionist policies. Most of the figures indicating increasing import tariffs or antidumping procedures do not make temporal comparisons (e.g., the report to the Trade Policy Review Body [TPRB] by WTO staff), or they use 2007 as a reference year for comparison. The monthly newsletter of the Institute for the Integration of Latin America and the Caribbean (INTAL) states that "according to the information from the International Trade Centre (ITC) and the WTO, during the first half of 2008 the number of antidumping cases raised by 40 percent" (INTAL 2009, 4). The newsletter, however, does not specify whether this refers to an increase since the first half of 2007, nor does it provide any medium-term references. Gamberoni and Newfarmer (2009) affirm that after a period of slowdown, the number of antidumping cases (in terms of both investigations initiated and imposition of duties) surged in 2008, particularly in the second half of the year. Furthermore, the authors find that compared with 2007, antidumping initiations grew by 15 percent, and findings with impositions of duties grew by 22 percent. Again, however, it is not clear that 2007 is the correct year for comparison.

Figure 1 indicates trade disputes handled by the WTO from 1995 to 2008. Given that seasonal variations are large, the data are aggregated into four consecutive quarters. Of course, a lag exists between the time that a protectionist measure was implemented and the

² The GPA is the WTO's Government Procurement Agreement, and NAFTA is the North American Free Trade Agreement, which involves the United States, Canada, and Mexico.

time a complaint was filed. As a result, the observed increase in the number of trade disputes during the last quarter of 2008 might reflect the increase in antidumping procedures noted in early 2008. However, this phenomenon is not unique; it also occurred in 2000 and 2002.

Figure 1. Trade disputes handled by the WTO's Dispute Settlement Body, 1995-2008



Source: WTO website (http://www.wto.org/english/tratop_e/dispu_e/dispu_status_e.htm)

Note: Data are aggregated into four consecutive quarters to account for large seasonal variations.

It should be noted, however, that it is difficult to obtain reliable information on these matters. For example, WTO staff members refer to protectionist measures, but concede that “the information on changes in trade policies and trade-related policies contained in this report has been collected by the Secretariat from a variety of public and official sources. In some cases it has been possible to verify the information through formal channels, but in most cases it has not.” (WTO Secretariat, 2009, Para. 5)

The Moving Landscape of Trade Policies

It has often been stated that pressure for protectionism is cyclical. Although this statement is difficult to support with concrete evidence, it has been reliably demonstrated that protectionism was cyclical in rich countries from the end of the 18th to the middle of the 20th century (see Messerlin 1985; Bairoch 1995 and Irwin 1992 among others). However, it is unclear whether this applies to all countries throughout the world, because no historical database on applied protection exists at the global level. In addition, a decreasing national average can hide increases in tariffs at the product level. For these reasons, we herein examine the frequency of yearly tariff increases in 164 countries between 1995 and 2006 using the TRAINS (TRade Analysis and INformation System) database.³

At the global level, the frequency of tariff increases is significant in all sectors, even though, at close to 5 percent, it isn't large. While this frequency is higher than 20 percent in

³ Given that the ad-valorem equivalent of specific tariffs may vary due to modification of unit values, combined with the fact that we focus on discretionary variations of import duties, we neutralize the effect of unit value variations. Appendix Table C.1 gives some of these calculations.

the case of five countries (see Table C.1, Appendix C), tariff increases are generally more frequent in the agricultural sector.⁴ This is particularly true in rich countries, such as the EU, the US, and Japan, as well as in Norway and middle-income countries such as Poland and the Ukraine. In Norway, for example, while annual tariff increases occurred in only 0.2 percent of all nonagricultural cases from 1995 to 2006, they were noted in 22 percent of agricultural cases.

Table 1. Frequency of most favored nation tariff increases, 1995-2006 (percent)

A. All sectors							
WTO	4.66	LDCs	4.09	MICs	5.18	OECD	3.32
Non-WTO	5.30	Non-LDCs	4.89	Non-MICs	3.80	Non-OECD	4.93
B. NAMA							
WTO	4.46	LDCs	4.06	MICs	5.01	OECD	2.58
Non-WTO	4.99	Non-LDCs	4.64	Non-MICs	3.50	Non-OECD	4.79
C. AMA							
WTO	6.00	LDCs	4.29	MICs	6.24	OECD	8.36
Non WTO	6.97	Non-LDCs	6.55	Non-MICs	5.81	Non-OECD	5.81

Sources: TTrade Analysis and INformation System (TRAINS) database and authors' calculations.

Notes: WTO indicates World Trade Organization; NAMA, nonagricultural market access; AMA, agricultural market access; LDCs, least-developed countries; MICs, middle-income countries; and OECD, Organization for Economic Co-operation and Development.

Does this behavior differ across countries according to specific characteristics? In particular, is WTO membership or the level of national income associated with the level or frequency of MFN tariff increases? Table 1 provides some answers by displaying the frequency of MFN tariff increases from 1995 to 2006 based on whether or not countries are WTO members; whether or not they are classified as least-developed countries (LDCs), middle-income countries (MICs), or members of the Organization for Economic Cooperation and Development (OECD); and whether the calculations are for all sectors, for agricultural sectors, or for nonagricultural sectors.

From this, we see that the propensity to augment MFN tariffs is lower among WTO members compared with non-WTO members, and it is lower in industry than in agriculture. It appears that LDCs⁵ raised their MFN tariffs less frequently than the world average, while MICs did so more often. The propensity of OECD countries to augment their MFN tariffs was low in industry but relatively high in agriculture (i.e., higher than in the cases of MICs and LDCs).

Economic Crisis, Trade Wars, and Retaliations

The current financial crisis ostensibly fosters demand for protectionism and could lead to new trade barriers, as occurred after the October 1929 crisis. A parallel can easily be drawn between the current situation and the one that existed then; in the early 1930s,

⁴ Due to the volatility of agricultural prices, governments adjust trade policies more frequently. This is consistent with the political economy model used to define trade policy scenarios; in the Jean, Laborde, and Martin (2008) model, lobbies have domestic price targets.

⁵ These findings are consistent with those from previous reports (e.g., Laborde 2008) emphasizing the fact that LDCs have less sophisticated trade policies than more developed economies, in particular due to the lack of administrative capacity.

unemployment was rising, fear of deflation prevailed, and a lack of public resources (which was more pronounced in countries that paid war reparations) prevented governments from remedying the economic crisis. Moreover, as in 1930, the current context of decreasing prices can mechanically reinforce protection because specific duties (which are defined as monetary amounts by physical units, and are numerous in agriculture) become increasingly more restrictive when world prices are down. In this type of economic context, protectionism is a tempting policy instrument for policymakers; it increases domestic prices, supports domestic activity, and provides new public income ... albeit short-sightedly. In the Republican platform of the 1928 presidential election, the tariff was presented as the “household remedy” (Isaacs 1948), in that it was aimed at increasing domestic prices and economic activity. However, the role of the Smoot-Hawley Tariff Act and the subsequent tariff retaliations in the decline of trade after 1930 should not be overestimated. Recent evaluations (Irwin 1998; Madsen 2001) show that discretionary increases in tariff rates only explain a minor part of the post-1929 contraction of trade. For example, Madsen (2001) estimates that, from 1929 to 1932, real world trade declined by approximately 14 percent because of decreasing national incomes, by 8 percent because of discretionary tariff increases, by 5 percent because of deflation-induced tariff increases, and by 6 percent as a result of nontariff barriers.

It has been theoretically and empirically proven that trade openness is employment-creating and income-supporting in sectors in which an economy has a comparative advantage, but that it has a negative impact on employment and incomes in sectors where the economy has a comparative disadvantage. This implies that trade openness leads to restructuring of an economy (which can be costly) and is less unpopular in times of economic growth. During economic recession, the job market provides fewer opportunities, and any threat to existing jobs is perceived negatively. In times of stagnation, lobbying for protection will increase above the usual levels in sectors lacking a comparative advantage, especially when those sectors are small and geographically/socially homogenous (Olson 1965). This explains why demand for protection is currently so strong in the US automobile and textile/apparel sectors, in the European agricultural and automobile sectors, in the Japanese agricultural sector, and so on.

Finally, governments do not always correctly anticipate world retaliation and counter-retaliation, as was the case with the US in 1930 and also last year when, in the middle of the food crisis, governments implemented export bans and export restrictions in successive rounds of retaliation and counter-retaliation. The economic theory of retaliation concludes the following:

- A trade war does not systematically eliminate all trade (Johnson 1953).
- Policy instruments are not equivalent; in particular, quantitative restrictions are more damaging than tariff barriers (Tower 1975).
- Large countries can benefit from a trade war, while small countries always lose (Johnson 1953); this point is noted by Hadi Soesastro (in Baldwin and Evenett 2009) when he states that the largest economies should be more tempted by protectionism today.
- Trade wars may be long and damaging when countries do not identify the originator of the process (Axelrod 1981); conversely, countries have to be “nice” in order to reestablish cooperation as quickly as possible.

Finally, there is another factor that should contribute to rising protectionism. The failure to yet reach a multilateral trade agreement mainly comes from disagreements between rich and

emerging countries, for example, between India and the US on the Special Safeguard Mechanism in agriculture; between the US and West Africa on cotton; and between the EU and Brazil on tariff reductions in agriculture. This clearly defines lines of demarcation that could be the basis for future trade disputes.

Thus, we see that there is no strong evidence of rising protectionism today, at least up through March 2009. However, it is also clear that policymakers have historically changed trade policies in reaction to their current economic conditions. In fact, even in the post-World War II period—which is a remarkable period of history in terms of the increasing liberalization of trade policies—trading partners (including WTO members) have frequently augmented their tariff protection when needed. This is particularly true for MICs in all sectors and for OECD countries in agriculture.

3. ALTERNATIVE SCENARIOS AND METHODOLOGY

Against this background, we herein seek to compare the magnitude of gains from trade cooperation compared with noncooperation, and to explore how a negotiated DDA may be able to protect the world trading system from a rise in protectionism. We examine various scenarios comparing the implementation of the July 2008 package, including different non cooperative scenarios (i.e., the implementation of bound duty levels, the implementation of the highest MFN tariff applied during the 1995-2006 period for each importing country and product, etc.) and the implementation of these noncooperative scenarios with and without the implementation of the DDA. The last element will indicate how a new trade negotiation could insure the world trading system against the risk of trade wars.

These assessments are carried out using the MIRAGE model of the world economy, with protection data derived from the MacMapHS6 database and a new historical database on applied MFN protection. The remainder of this chapter offers an overview of the methodology utilized in this study, followed by a detailed description of each of the modeled scenarios.

Methodology

Tariff reform is implemented at the disaggregation level of the MacMapHS6v2.1 database (Laborde 2008) with bound and applied tariff data for 2004 at the HS6 (Harmonized System level 6) product level (including 5,113 products, 170 importing countries, and 208 exporting countries).⁶ We add several updates to account for all major changes that occurred up until 2008, including major regional trade agreements (RTAs), new WTO members (such as the Ukraine), and the trade policy consequences of ongoing domestic reforms (such as the EU sugar trade reform). The TRAINS database is used to investigate tariff changes since 1995; a special procedure is adopted to ensure comparability of MFN tariff rates between the MacMapHS6 and TRAINS databases. To ensure intertemporal comparison of nominal protection, all specific tariffs are converted using the reference group unit values from MacMapHS6v2. However, for the purpose of tariff reduction formula classification, the official guidelines for computing unit values are used. All trade policy scenarios are implemented on a yearly basis, following the relevant timelines in each case.

The political economy model developed by Jean, Laborde, and Martin (2008) is used when sensitive products are selected to implement tariff scenarios (i.e., in both DDA scenarios and in all FTA agreements studied, both for the baseline and relevant scenarios). An extension of this model is used to define the binding strategy of developing countries in the DDA scenario. Indeed, for a particular scenario, when we combine tariff increases with DDA implementation, it is very important to have a theoretically-based approach to define the new bound tariffs, particularly for countries that benefit from wide flexibilities to achieve their new binding coverage goal (Small and Vulnerable Economies – SVEs – and LDCs in particular). In such cases, we replace the base year of the applied tariff (i.e., 2004) with the highest tariff during the period 1995-2006 to compute the political cost of any new commitments.⁷ Here, the DDA modalities (WTO 2008a) define the overall constraints faced

⁶ Slight modifications have been made to the MacMapHS6v2.1 dataset: Malaysia's tariffs on tobacco products are updated (lowered), marginal protection on Chinese cereal Tariff Rate Quotas (TRQs) are reduced, and the protection faced on sugar and bananas from ACP (African-Caribbean-Pacific) countries in the EU market is modified to better capture preference erosion mechanisms.

⁷ This affects Equation 6 of the Jean, Laborde and Martin (2008) model.

by each country. Finally, when WTO members liberalize under the DDA, market access for non-WTO members remains unchanged.

Tariffs are aggregated from the HS6 level to match the aggregation of the model (see below) using the reference group weighting scheme methodology (see Boumellassa, Laborde, and Mitaritonna 2009); the tariffs are then implemented in MIRAGE, assuming perfect competition across all sectors. (A full description of the model is available in Decreux and Valin 2007.) Based on standard and robust assumptions, it should be noted that the model may underestimate the positive effects of trade reform, particularly when such reform drives new investments, technology improvements, or important trade or production diversification.

In each country, a representative consumer maximizes a CES-LES (Constant Elasticity of Substitution – Linear Expenditure System) utility function under a budget constraint to allocate his income across goods. The origin of goods is determined by a CES nested structure following the Armington assumption. In addition, Northern countries are assumed to produce higher-quality industrial goods compared with those supplied by Southern countries. On the production side, value-added and intermediate goods are complements under a Leontief hypothesis. The value-added is a CES function of unskilled labor and a composite of skilled labor and capital, allowing reduced substitutability between the last two production factors. In agriculture and mining, production also depends on land and natural resources. Investment is savings-driven, and the current account is assumed to be constant in terms of global gross domestic product. This last assumption is important because it means that tariff reductions (under the DDA scenarios) and tariff increases (under the protectionist scenarios) will have positively correlated impacts on both imports and exports for every country.

Macroeconomic data (such as world trade flows, production, consumption, and intermediate use of commodities and services) are derived from the GTAP 7 database. Twenty-seven regions are identified in the model (including eight high-income regions), and mapped to the main trade blocks. Sectoral decomposition is highly detailed in terms of agriculture and agri-food business (12 sectors) because most of the protection is concentrated in this sector. All other sectors are nonagricultural, including 13 industrial sectors and two service sectors.⁸

A baseline is implemented from 2008 to 2025, depicting the world without a new multilateral agreement. Concerning trade reform, the following post-2004 agreements are included in the baseline:

- full free trade agreements (FTA) for the Association of Southeast Asian Nations (ASEAN), the Monetary and Economic Community of Central Africa (CEMAC), the Common Market for Eastern and Southern Africa (COMESA), and the Southern African Development Community (SADC);
- economic partnership agreements (EPA) between Asian, Caribbean, and Pacific (ACP) countries and the EU;
- implementation of FTAs between the EU and India, the EU and ASEAN countries, the US and Colombia, the US and Oman, the US and Bahrain, the US and Morocco, the US and Australia, Mercosur countries and Colombia, and China and Chile;

⁸ The sectoral and geographic decomposition is presented in Appendix A, including correspondence with GTAP sectors.

- all ongoing WTO accession commitments, including those of the most recent members (Ukraine, Cape Verde, and Vietnam);
- an updated Japanese GSP (Generalized System of Preferences) scheme in favor of LDC countries;
- modified bound tariffs on EU poultry;
- the EU inclusion of Romania and Bulgaria in 2007; and
- the end of the EU EBA (Everything But Arms) regime for protocol products (sugar, banana, and rice).

This baseline serves as a point of comparison for all modeled scenarios, and the projected results are reported for 2025. The analysis does not account for the surge in world prices for energy and food products observed between 2004 and 2008.

Descriptions of the Modeled Scenarios

The seven scenarios analyzed herein include the Doha compromise of July 2008, four alternative scenarios driven by the failure of negotiations, and two scenarios combining the implementation of the Doha compromise of July 2008 and a global resort to protectionism. Specific names and descriptions are as follows:

1. **DDA Scenario:** Implementation of the July 2008 DDA modalities.
2. **Up-to-the-Bound Scenario:** Non-FTA applied tariffs are increased to existing bound levels.
3. **Bound&DDA Scenario:** Implementation of the July 2008 DDA modalities, plus increase of non-FTA applied tariffs to their new, post-DDA bound levels.
4. **Up-to-the-Max Scenario:** Non-FTA applied tariffs are increased to their maximum level since 1995, capped by the existing bound tariffs.
5. **Max&DDA Scenario:** Implementation of the July 2008 DDA modalities, plus increase of non-FTA applied tariffs to their maximum level since 1995, capped by the new, post-DDA bound tariffs.
6. **FTA-HICs:** An FTA covering 95 percent of tariff lines implemented among high- income countries.
7. **Max and FTA-HICs Scenario:** A combination of the Up-to-the-Max and FTA-HIC scenarios.

The DDA Scenario

The first scenario represents a successful Doha outcome based on the July 2008 modalities. After seven years of trade talks, market access modalities have reached a high level of sophistication. Even if the general philosophy is simple, progressive tariff-cut formulas for both agricultural and nonagricultural goods have introduced flexibilities with different degrees of special and differential treatment for different groups of developing countries. Following our previous work (Laborde, Martin, and van der Mensbrugghe 2008 and Berisha et al. 2008), this scenario implements all the details of these modalities⁹ in terms of market access, including tariff-cutting formulas, country and product flexibilities (sensitive and

⁹ A full description of the modalities implemented in this study is provided in Laborde, Martin, and van der Mensbrugghe (2008). This scenario is based on the May 2008 modalities (WTO 2008a and WTO 2008b).

special products), and special provisions for tariff escalation, tropical products, and long-standing preferences. This scenario does not account for changes in the sectoral initiative resulting from the lack of agreement on this issue.

For the duty-free-quota-free market access initiative for LDCs and OECD members (excluding South Korea but including Mexico and Turkey), we assume a 3 percent exemption clause in terms of products.¹⁰ Export subsidies are phased out by 2013 for developed countries.

Concerning domestic support, the DDA scenario includes the overall constraint on overall trade-distorting support (OTDS) for the US and the EU. In contrast with most traditional exercises, where domestic support commitments are translated as ad valorem or specific subsidy caps for current applied policies, we explicitly introduce the OTDS as an overall limit for domestic support spending for each year. In the dynamic context, and due to the growth of production in the baseline, the initial agricultural subsidy rates based on 2004 prices may lead to a violation of the new commitments. In our simulation, it appears that only the US¹¹ will face a real constraint, forcing it to modify its distorting production programs. With the reduction scheme of the OTDS on one hand, and increasing production on the other, we estimate that subsidy rates on production and some production factors should start to decrease by 2011 and will need to be halved by 2025 to stay below the final US\$16.4 bn limit. Any domestic support reduction will affect all sectors uniformly. Since this paper focuses on tariffs and tariff changes across scenarios, we do not introduce program-specific modeling of domestic support policies, nor do we develop a political economy model to explain how reduced domestic support should be handled across commodities. Our goal is purely to show that, even if they do not drive domestic support reduction today, the new OTDS commitments will have real value in the medium run. The consequences of this treatment are discussed in Appendix B.

Due to the complexity of integrating other DDA elements into the simulations, we omit other sources of potential gains, such as liberalization in services, WTO rules, trade facilitation, and intellectual property rights.

The Up-to-the-Bound Scenario

Two protectionist scenarios are analyzed in order to offer a contrasting picture to the DDA scenario. The first option, the Up-to-the-Bound scenario, examines the possibility of WTO member countries raising their tariffs to their Uruguay Round bound level over a five-year period (2009-14). The scenario assumes that the entire binding overhang will be eliminated. For unbound lines, the existing average binding overhang is used to compute new tariff targets.¹² This scenario represents a strong increase in protection by eliminating all unilateral liberalization, but it does not represent an open trade war between WTO members. Existing commitments are still respected.¹³

¹⁰ This scenario mimics Scenario F in Berisha et al. (2008).

¹¹ The recent CAP (Common Agricultural Policy) reform allows the EU to largely reallocate domestic programs to the green box.

¹² Technically, we estimate the following relationship for each country: $\text{Bound_Rate} = a \text{ MFN_rate} + b$ on bound lines; we then apply parameters a and b on the applied MFN rate to build theoretical bound tariffs for the unbound lines.

¹³ Even while countries adhere to their commitments, we may imagine that they could use additional tools (e.g., using contingent protection and initiating litigation for the purpose of retaliation) to increase their protection above bound levels.

On one hand, this scenario may appear extreme, especially given that during the Uruguay Round, many developing countries used a ceiling option to bind their tariffs to levels they have never (and will never) apply. Countries also apply zero tariffs on a large selection of raw materials and imported inputs, even if the existing bound tariffs are strictly positive. On the other hand, the Up-to-the-Bound scenario is not the worst that could be anticipated; many countries have not bound their import tariffs and remain unconstrained by any upward limitation. In our scenario, in some cases applying the country-specific existing binding overhang can underestimate the desire to impose high protection on specific products. Moreover, antidumping duties and safeguard mechanisms can be activated and can restrict trade, even in rich countries where binding overhangs are either limited or nonexistent.

Under this scenario, only MFN applied rates and nonreciprocal, preferential rates are modified. The only nonreciprocal program maintained is the EU's EBA initiative; this is due to the way in which this program has been implemented and renewed in the EU's legislation.¹⁴

The Bound&DDA Scenario

The Up-to-the-Bound and Bound&DDA scenarios are designed to measure the extent to which the implementation of the July 2008 package could reduce the cost of a new trade war by lowering bound duties. The Bound&DDA scenario combines the DDA and the Up-to-the-Bound scenarios, but uses bound duties derived from the July 2008 package. Therefore, the difference between this scenario and the Up-to-the-Bound scenario is the extent to which a new trade agreement under the DDA could reduce the capacity of WTO members to augment MFN tariffs. It is also important to note that the treatment of bound tariffs is very different under this scenario compared with the Up-to-the-Bound scenario. Contrary to the earlier scenario, under which an average binding margin is applied uniformly based on existing binding overhang, under the Bound&DDA scenario we apply the new DDA constraints in terms of binding rules (based on the Jean, Laborde, and Martin [2008] political economy approach combined with past trade policy behavior). As above, only MFN applied rates and nonreciprocal preferential rates are modified.

The Up-to-the-Max Scenario

To adopt a more realistic protectionist scenario, historical data are used to determine the highest applied protection rate implemented by every country during 1995-2006. We then select the minimum level from the historical maximum and the existing bound level. This scenario corresponds to the situation in which governments apply the most adverse trade policies of the past ten years, while still respecting their Uruguay Round commitments.¹⁵ On an historical basis, tariffs evolve in response to changes in world prices, domestic production structures, and political pressures. This scenario allows us to capture the share of binding overhang that is really relevant for private agents, because it corresponds with the behavior exhibited by policymakers since the end of the Uruguay Round. It is important to note that for all scenarios with increasing tariffs, the preferential tariffs protected by bilateral or regional agreements remain unchanged.

¹⁴ It is important to note that, given the implementation of the EPA between the EU and the ACP countries, LDC preferences in the EU are not protected by a bilateral agreement.

¹⁵ During this period, trade policies have been adjusted in reaction to highly contrasting situations (i.e., slow vs. fast growth, low vs. high agricultural prices, and so on).

The Max&DDA Scenario

Under this scenario, we combine the scenario of the DDA plus the Up-to-the Max scenario by using the new bound duties defined in the July 2008 package, so the tariff applied is the lesser of the highest duty applied during 1995-2006 and the newly defined bound duty. The difference between these scenarios can also be represented as the benefit from the DDA as an insurance scheme against trade wars. As above, only MFN applied rates and nonreciprocal preferential rates are modified.

FTA-HICs Scenario

Another potential effect of failed Doha negotiations is that countries may be more likely to seek market access gains through bilateral or plurilateral agreements. It is possible to imagine a multiplication of FTAs that would further complicate what is already “a spaghetti bowl” of agreements, thereby increasing trade costs due to a lack of transparency and the complexity of overlapping rules of origin. However, this study focuses on the implementation of one plurilateral agreement (i.e., the FTA-HICs scenario). This scenario assumes that HICs will adopt a zero-for-zero approach, whereby each member of the plurilateral agreement will liberalize 95 percent of its tariff lines.¹⁶ Several considerations justify this choice. First, North-South and South-South negotiations are still difficult to conduct, are often delayed, and—especially within the South—are weakly enforced. Second, HICs will place the responsibility for the failure of the DDA on a lack of commitment on the part of MICs to open their own markets. In return, the HICs may decide to move more quickly toward freer trade with countries ready to do this. Finally, by implementing a 95 percent duty-free agreement, rich countries will comply with article XXIV under the GATT, and will protect their sensitive sectors, especially agriculture. At the same time, an FTA will not entail commitments regarding export subsidies and domestic support policies, which is another delicate issue for some OECD countries.

The Max&FTA-HICs Scenario

The Max&FTA-HICs scenario combines a rise in protection to past levels with the implementation of an HIC FTA. An HIC FTA will lead to increased differences between insiders and outsiders and will trigger retaliatory trade blocks. Thus, this scenario may represent a stage that could follow the FTA-HIC scenario.

¹⁶ Nonliberalized products are selected using the Jean, Laborde, and Martin (2008) political economy criterion.

4. RESULTS

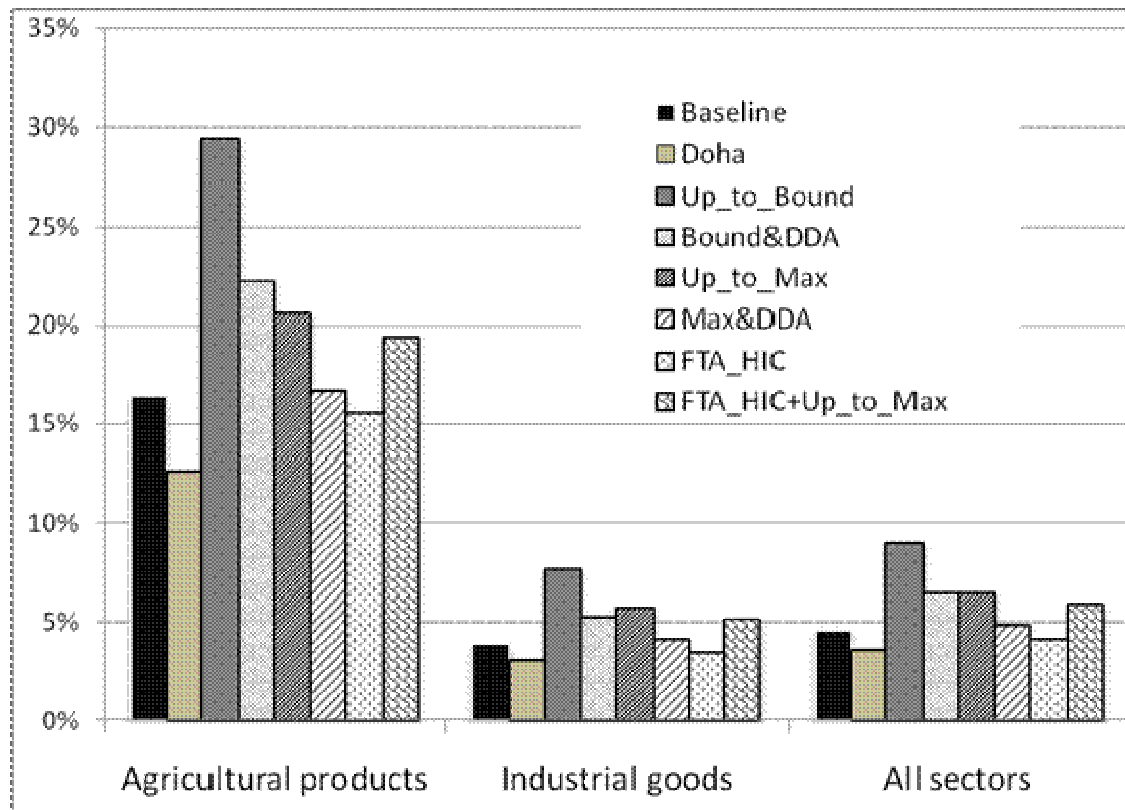
The Impact on Protection and Market Access

Figure 2 displays the consequences of the seven scenarios modeled herein on average world tariffs. Under the DDA scenario, projected world protection is reduced from 4.6 to 3.6 percent, representing a 22 percent reduction compared with the baseline. In contrast, under the Up-to-the-Bound scenario, on average, protection nearly doubles. The elimination of unilateral tariff reductions enacted during the past ten years, represented by the Up-to-the-Max scenario, has a more limited impact but still represents an increase of 41 percent in world tariffs compared with the baseline (from 4.6 percent to 6.4 percent). Even with its limited geographical scope, the implementation of the FTA-HICs scenario affects global-level protection through its impact on important economic zones, particularly trade inside “the Quad” (Canada, the EU, Japan and the US). This FTA will exclude many agricultural products; consequently, the average rate of tariff cut under this scenario is lower for agricultural products (5 percent) than for nonagricultural products (11 percent).

The implementation of the July 2008 package has a significant impact on potential future trade wars. If the DDA is not implemented, current protection could double if countries resort to bound levels; in contrast, protection increases by only 41 percent when the DDA is implemented. Under the Max&DDA scenario, world protection increases by only 5 percent, whereas under the Up-to-the-Max scenario it increases by 41 percent. These comparisons show the extent to which the implementation of the July 2008 package could allow us to avoid the costs of protectionism.

As is clearly shown in Figure 2, variations in protection differ even more when we look specifically at agriculture. World agricultural protection decreases by 23 percent if the July 2008 package is implemented, whereas it is 1.8 times higher if bound duties are applied. When we compare world agricultural protection under the DDA (12.6 percent) to that under a global resort to bound duties (29.4 percent), we get a ratio of 1 to 2.33. When the reference is maximum duties applied in the 1995-2006 period, the ratio is 1 to 1.63. If we compare world bound protection in agriculture with and without the implementation of the DDA, the ratio is 1 to 1.32.

Figure 2. Average world tariffs by scenario, 2025 levels



Source: MAcMapHS6v2.1, TRAINS, and authors' calculations using the reference group-weighting scheme.

Table 2 and Table 3 present the results of protection applied on imports and faced by exports, respectively, for groups of countries. The DDA scenario cuts the applied protection by one-third for HICs and by one-tenth for MICs, which is a significant achievement compared with previous rounds of the GATT. This scenario also locks existing market access due to unilateral liberalization on the basis of MFN or nonreciprocal preferences. Indeed, under the Up-to-the-Bound scenario, protection increases by 48 percent in HICs, by 132 percent in MICs, and by 270 percent in LDCs compared with the baseline levels. Under the Up-to-the-Max scenario, protection in the same three groups of countries increases by 23 percent, 56 percent, and 67 percent, respectively. Interestingly, for HICs, the combination of the FTA and the increase in tariffs applied to other countries to past-observed levels (Max&FTA-HICs scenario) leaves the average level of applied protection unchanged.

It is notable that implementation of the July 2008 package provides better access to HIC markets (from 3 percent down to 1.9 percent in all sectors, but from 15.6 percent to 10.3 percent in agriculture), whereas variation in the protection applied by MICs is small (from 8.5 percent down to 7.8 percent in all sectors), and that by LDCs is nonexistent. At the same time, the July 2008 package gives world exporters an insurance policy against the potential rise in applied protection by MICs and LDCs: while protection increases from 8.6 percent to 14 percent (the bound level) when the DDA is applied, it increases to 19.8 percent when it is not. As far as LDCs are concerned, when we compare the Up-to-the-Bound and Bound&DDA scenarios, tariffs increase more in the second instance. Indeed, the flexibilities granted by the DDA modalities to bind tariffs will provide more freedom to

increase tariffs compared to the homogenous binding overhang rate applied to build the Up-to-the-Bound scenario. By using the political economy model in binding tariffs combined with the new rules, governments can achieve higher levels of protection than are possible using a homogenous rate of binding overhang computed on existing bound tariff lines. This is consistent with the idea that unbound products are most sensitive.

Table 2. Protection applied on imports, by country category and scenario

Country category/sector		Scenario							
		1.	2.	3.	4.	5.	6.	7.	
			Up-to-the-Bound	Bound & DDA	Up-to-the-Max	Max & DDA		Max & FTA-HIC	
		Baseline	DDA				FTA-HIC	FTA-HIC	
HICs									
Agricultural products		15.6	10.3	22.9	15.6	18.5	13.6	14.3	16.7
Industrial goods		2.2	1.4	3.3	2.1	2.8	1.6	1.6	2.0
All sectors		3.0	1.9	4.4	3.1	3.7	2.3	2.4	2.9
MICs									
Agricultural products		18.3	17.6	40.8	33.4	24.9	23.0	18.3	24.9
Industrial goods		7.9	7.0	17.9	12.2	12.9	10.2	7.9	12.9
All sectors		8.6	7.8	19.8	14.0	13.3	10.9	8.6	13.3
LDCs									
Agricultural products		11.6	11.6	65.3	65.5	20.0	20.0	11.6	20.0
Industrial goods		9.2	9.2	31.4	34.2	16.5	14.3	9.2	16.5
All sectors		9.8	9.8	36.1	38.6	16.3	14.6	9.8	16.3
World									
Agricultural products		16.4	12.6	29.4	22.2	20.6	16.7	15.5	19.3
Industrial goods		3.9	3.0	7.6	5.3	5.7	4.2	3.5	5.2
All sectors		4.6	3.6	9.0	6.4	6.4	4.8	4.2	5.9

Sources: MAcMapHSv2.1, TRAINS, and authors' calculations using the reference group-weighting scheme.

Notes: HICs indicates high-income countries; MICs, middle-income countries; and LDCs, least-developed countries.

It is worthwhile to examine which group of countries is most severely affected by these scenarios in terms of access to foreign markets (Table 3). In relative terms, the DDA scenario manages to deliver homogeneous market access gains with an average decrease of about 20 percent of the tariffs faced by three groups of countries: from 4.6 percent to 3.6 percent for both HIC and MIC countries, and from 4 to 3.2 percent for LDCs. In contrast, the other scenarios have significantly different results. Although the two protectionist scenarios have similar effects for HICs and MICs (97 and 93 percent, respectively, under the Up-to-the-Bound scenario and 42 and 37 percent, respectively, under the Up-to-the-Max scenario), the LDCs are more severely affected due to losses of nonreciprocal preferences,¹⁷ in particular, the protection faced by LDCs is nearly tripled in the US and Japan. Consequently, the implementation of the DDA is of great interest to LDCs, not only because it improves access to foreign markets (albeit at the price of eroded preferences), but also because it locks unilateral schemes, particularly the most recent initiatives. DDA implementation will eliminate a potential rise in the protection facing their exports: based on

¹⁷ With the exception of the EU market, where the EBA program is maintained.

the maximum protection faced during 1995-2006, the protection facing LDC exports increases from 4.6 to 6.4 percent if the DDA is not implemented, but only by 4.8 percent if the DDA is applied. Of course the FTA-HICs scenario only benefits HIC countries (a 14 percent decrease in faced protection) but to a lesser degree than the DDA scenario.

Table 3. Protection faced by exports, by country category and scenario

Country category/sector	Baseline	Scenario						
		1	2	3	4	5	6	7
		DDA	Up-to-the-Bound	Bound & DDA	Up-to-the-Max	Max & DDA	FTA-HIC	Max & FTA-HIC
HICs								
Agricultural products	16.1	11.9	28.5	21.1	20.3	16.1	14.6	18.2
Industrial goods	3.8	3.0	7.7	5.4	5.6	4.2	3.2	4.8
<i>All sectors</i>	<i>4.6</i>	<i>3.6</i>	<i>9.0</i>	<i>6.4</i>	<i>6.5</i>	<i>5.0</i>	<i>3.9</i>	<i>5.6</i>
MICs								
Agricultural products	17.1	13.8	30.6	23.7	21.2	17.7	17.1	21.2
Industrial goods	4.0	3.0	7.5	5.0	5.9	4.0	4.0	5.9
<i>All sectors</i>	<i>4.6</i>	<i>3.6</i>	<i>8.9</i>	<i>6.4</i>	<i>6.3</i>	<i>4.6</i>	<i>4.6</i>	<i>6.3</i>
LDCs								
Agricultural products	9.9	8.2	30.2	24.0	14.6	12.6	9.9	14.6
Industrial goods	3.9	2.7	9.4	6.2	9.0	4.5	3.9	9.0
<i>All sectors</i>	<i>4.0</i>	<i>3.2</i>	<i>11.7</i>	<i>8.5</i>	<i>7.3</i>	<i>4.7</i>	<i>4.0</i>	<i>7.3</i>
World								
Agricultural products	16.4	12.6	29.4	22.2	20.6	16.7	15.5	19.3
Industrial goods	3.9	3.0	7.6	5.3	5.7	4.2	3.5	5.2
<i>All sectors</i>	<i>4.6</i>	<i>3.6</i>	<i>9.0</i>	<i>6.4</i>	<i>6.4</i>	<i>4.8</i>	<i>4.2</i>	<i>5.9</i>

Sources: MAcMapHS6v2.1, TRAINS, and authors' calculations using the reference group weighting scheme.

Notes: HICs indicates high-income countries; MICs, middle-income countries; and LDCs, least-developed countries.

Economic Impacts

The MIRAGE model is used to assess the economic impacts of these different tariff and domestic support scenarios to 2025.

Economic Impacts at the Global Level

Table 4 indicates the global results for all scenarios for the world economy in 2025 compared with the baseline. Under the DDA scenario, focusing only on part of the DDA agenda (the tariff liberalization and domestic support discipline), we see that world trade increases in 2025 by a mere 1.9 percent (US\$363 bn), and real world income by US\$59 bn. This confirms the findings of other studies (see Decreux and Fontagné 2006 and Bouët, Mevel, and Orden 2006), except that the gains here are slightly lower, mainly because the baseline includes numerous RTAs that already reduce applied tariffs without DDA implementation. Nevertheless, these numbers are driven by the assumption that no major political shock will occur if the DDA is not signed; this assumption should be considered carefully.

In case of the Up-to-the-Bound scenario, world trade contracts by 9.9 percent (US\$1,899 bn) and world real income by US \$353 bn. In the case of the less damaging Up-

to-the-Max scenario, world trade declines less (by 4.2 percent or US\$808 bn), but the increase in duties has a particular impact on agricultural exports (-9.4 percent), which would negatively affect the agricultural exports of developing countries (-11.5 percent). In addition, the export of industrial goods from developing countries also faces a substantial reduction (-4.4 percent).

Table 4. Global changes in exports and welfare by scenario, 2025

Country category/sector	Scenario						
	1	2	3	4	5	6	7
	DDA	Up-to- the- Bound	Bound & DDA	Up-to- the-Max	Max & DDA	FTA-HIC	Max & FTA-HIC
Change from baseline in 2025 (percent)							
Global goods and services exports by volume	1.90	-9.93	-5.70	-4.23	-1.19	0.56	-3.48
Agrifood sector	5.47	-20.26	-13.42	-9.36	-4.52	0.62	-8.53
Industry	1.96	-9.77	-5.07	-4.36	-0.95	0.66	-3.50
Global welfare	0.09	-0.51	-0.25	-0.19	-0.04	0.01	-0.19
North	0.07	-0.32	-0.20	-0.14	-0.08	0.02	-0.12
South	0.13	-1.00	-0.35	-0.32	0.06	-0.02	-0.35
Change from baseline in 2025 (value in constant 2004 US\$ bn)							
Global goods and services exports by volume	363	-1,899	-1,090	-808	-227	108	-665
Agrifood sector	73	-269	-178	-124	-60	8	-113
Industry	279	-1,389	-721	-621	-135	94	-497
Global welfare	59	-353	-169	-134	-26	4	-128
North	33	-156	-100	-70	-37	-9	-59
South	26	-197	-69	-64	11	-5	-69

Source: Authors' calculations based on MIRAGE simulations.

Notes: Welfare changes are computed as the equivalent variation. Export volumes are defined using a Fisher index. Intra-EU trade flows are excluded.

In the case of implementation of the July 2008 package and a subsequent increase in protection to bound levels, the decrease in world exports is only US\$1,090 bn, whereas it is US\$1,899 bn if the DDA is not applied. Thus, according to this assessment, DDA implementation has the capacity to prevent a potential loss of US\$809 bn in trade. If protectionism increases to the maximum protection applied during the 1996-2006 period, the DDA acts as an insurance policy worth US\$581 bn in trade.

It is important to note that the establishment of an HIC free-trade zone increases world trade by only 0.6 percent, because this agreement removes tariff barriers between countries that already operate under near free-trade conditions while at the same time allowing them to exempt 5 percent of their highly protected products from this process. This is not a major shock for world trade compared with protectionist scenarios or the failure of the DDA. While the HIC-FTA scenario benefits developed countries, resulting in a 0.02 percent increase in their real income, the trade diversion effect means that developing countries are negatively affected, incurring a 0.02 percent decline in their real income. When combined with the Up-to-the-Max scenario, the HIC-FTA scenario does not prevent a contraction of world trade, which declines by 3.5 percent (scenario Max&HIC-FTA).

The Economic Impact at the Country Level

In this section, we focus on the impact of various scenarios on national macroeconomic variables. In order to simplify the presentation, we focus on 17 countries/zones rather than the full 27. Table 5 illustrates how the various scenarios affect the value of the countries' exports. The Doha agreement is not projected to have any effects that are surprising in comparison to previous assessments. However, a look at the protectionist scenarios without implementation of the DDA reveals that some countries could be greatly affected by a global resort to protectionism. Brazil, for example, is highly specialized in agriculture, which is particularly affected by an increase in protectionism. Recall that the Up-to-the-Bound scenario increases world agricultural protection by 13 percentage points, but only increases that for industry by 3.7 percentage points (see Table 2). For this reason, Brazil's exports are especially reduced under the Up-to-the-Bound scenario (by 25.6 percent), which begs the question: Could the DDA serve as an insurance scheme against a potential rise of protectionism for Brazil? According to our findings, if the DDA is implemented, Brazil's exports would be reduced by only 7.4 percent if bound duties are adopted. The same mechanism is in play for the Up-to-the-Max and Max&DDA scenarios, but the magnitude of the results are significantly smaller.

Traditionally, assessments of the Doha agreement conclude that the potential effects for the EU and the US are small. This study arrives at the same conclusion (e.g., the increase in EU exports by 2025 is only 2.9 percent). However, we also assess the benefits of the DDA. First, we compare it (as a cooperative scenario) with non cooperative scenarios; for example, we find that the Up-to the-Bound scenario results in a 10.4 percent decline of EU exports and a 2.9 percent decline of US exports. Second, we examine how the DDA prevents the loss of exports related to increased protection; for example, the difference between the Up-to-the-Bound and Bound&DDA scenarios is 5 percent for the EU and 2.4 percent for the US. Table 4 illustrates that this new evaluation emphasizes the importance of the DDA for these large economies.

Variations in exports are also explained through the macroeconomic closure of the model, which supposes that each current account must remain constant. Under the Up-to-the-Bound and Up-to-the-Max scenarios, each country increases its applied protection, thereby decreasing its imports; in this case, the real exchange rate may appreciate in order to keep the current account constant.

Table 5. Changes in value of exports by scenario compared with baseline, 2025 (percent)

Country/grouping	DDA	Up-to-the-Bound	Bound & DDA	Up-to-the-Max	Max & DDA	FTA-HIC	Max & FTA-HIC
ASEAN LICs	2.1	-18.7	-30.8	-10.7	-5.3	0.1	-10.8
ASEAN MICs	2.2	-16.3	-8.0	-8.1	-3.8	-0.2	-8.4
ANZCERTA	3.3	-9.4	-1.0	-3.0	1.4	1.5	-1.0
Bangladesh	5.8	-51.8	-52.5	-9.6	-10.8	-0.5	-10.1
Brazil	4.0	-25.6	-7.4	-5.9	-0.7	-0.2	-6.2
Canada	0.5	-1.9	-1.7	-0.8	0.1	0.2	-0.4
Central Africa	0.1	-28.9	-26.9	-7.1	-7.1	-0.1	-7.2
China, excluding Hong Kong	4.7	-3.3	-1.2	-1.5	3.9	-0.1	-1.8
European Union	2.9	-10.4	-5.4	-8.6	-4.6	1.6	-6.3
India	1.8	-38.9	-12.7	-12.7	-3.1	-0.4	-13.1
Japan	3.2	-3.0	1.1	-1.7	2.1	1.3	-0.4
Mexico	0.6	-13.2	-5.2	-3.6	-2.0	-0.5	-4.2
Middle East and North Africa	4.4	-11.8	-1.4	-5.1	-0.2	-0.2	-5.3
Pakistan	2.1	-42.0	-35.3	-27.6	-20.9	-0.5	-28.1
Turkey	0.6	-12.4	-7.8	-5.7	-4.7	-0.8	-6.8
US	1.9	-2.9	-0.5	-1.0	1.0	1.6	0.5

Source: Authors' calculations based on MIRAGE simulations.

Notes: Intra-EU trade flows are excluded. ASEAN indicates Association of South East Asian Nations; ANZCERTA, the Australia and New Zealand group; LICs, low-income countries; and MICs, middle-income countries.

Table 5 presents the welfare impacts of various scenarios. The DDA scenario yields gains for all regions except Mexico.¹⁸ This loss can be explained by an erosion of preferences toward Canada and the US in the case of an agreed multilateral liberalization. In general, welfare gains under the DDA scenario are small; they are significant only for Brazil, Bangladesh, and the ASEAN MIC zone.

A rise of protectionism would mainly hurt MICs and LDCs. As pointed out, in the case of the Up-to-the-Bound scenario, the relative loss of welfare is three times larger for developing countries than for developed countries (see Table 4). Asian developing countries are particularly affected (see Bangladesh, India, and Pakistan in Table 6). The implementation of the DDA is important for these countries as an insurance against the risk of trade wars, particularly for India. We see a few cases for which increasing protectionism is beneficial. For instance, Canada takes advantage of increased preferential margins into NAFTA markets, while limited increases of its own tariffs improve the country's terms of trade (optimal tariff argument) and generate only small domestic distortions.

¹⁸ Nigeria and the rest of Eastern Africa are also affected by slight decreases in welfare.

Table 6. Changes in welfare by scenario compared with baseline, 2025

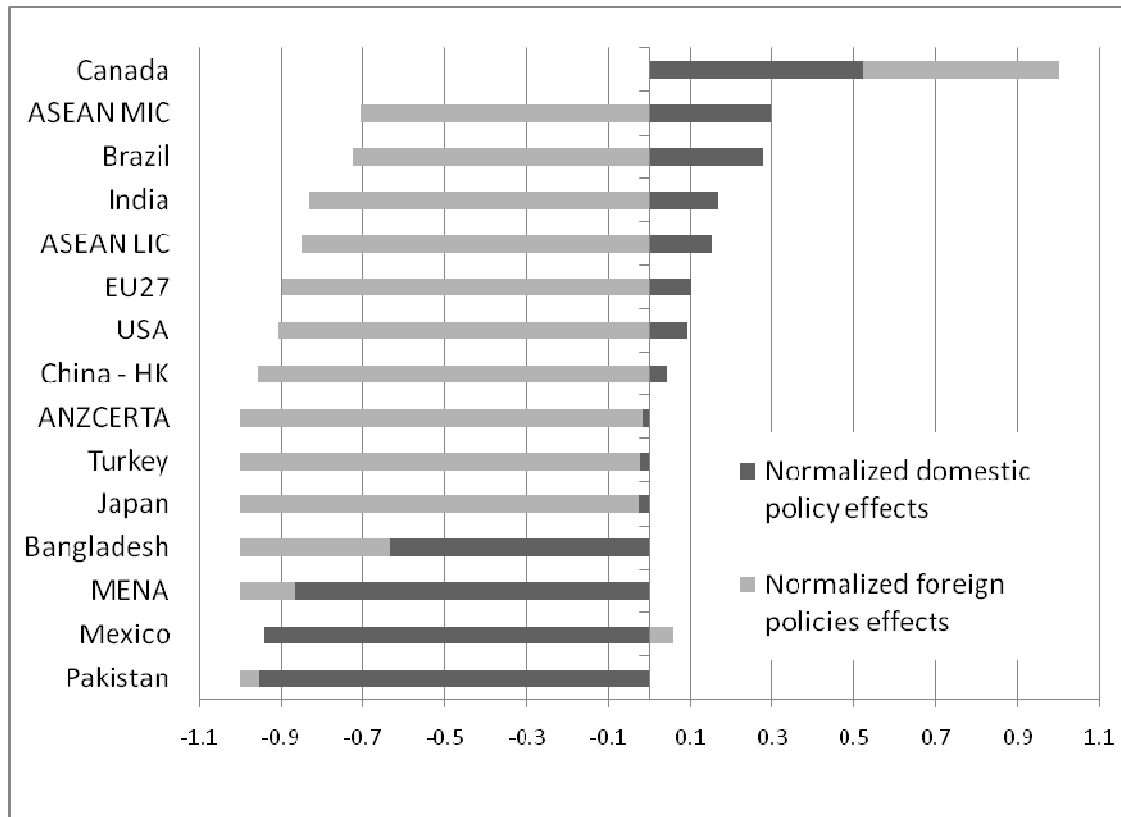
Country/grouping	DDA	Up-to-the-Bound	Bound & DDA	Up-to-the-Max	Max & DDA	FTA-HIC	Max & FTA-HIC
ASEAN LICs	0.4	-1.7	-1.3	-1.2	-0.1	0.0	-1.2
ASEAN MICs	0.6	-1.3	-0.2	-0.4	-0.1	-0.1	-0.6
ANZCERTA	0.1	-0.2	-0.1	-0.1	0.0	0.0	-0.0
Bangladesh	0.7	-2.0	-2.0	-0.6	-0.6	-0.0	-0.6
Brazil	0.3	-0.4	0.1	-0.1	0.2	-0.0	-0.1
Canada	0.0	0.0	0.1	0.1	0.1	-0.0	0.1
Central Africa	0.0	-0.0	0.2	0.8	0.8	-0.0	0.8
China, excluding Hong Kong	0.1	-0.5	0.2	-0.2	0.1	-0.0	-0.2
European Union	0.1	-0.5	-0.4	-0.3	-0.2	0.0	-0.2
India	0.0	-1.8	-0.8	-0.4	-0.1	-0.0	-0.4
Japan	0.2	-0.3	0.0	-0.1	0.1	0.1	-0.1
Mexico	-0.1	-1.7	-0.6	-0.2	-0.1	-0.1	-0.3
Middle East and North Africa	0.1	-0.6	-0.2	-0.2	-0.0	-0.0	-0.2
Pakistan	0.2	-2.1	-2.2	-2.0	-1.7	-0.0	-2.1
Turkey	0.1	-0.6	-0.3	-0.4	-0.3	-0.1	-0.5
US	0.0	-0.2	-0.1	-0.1	-0.0	0.0	-0.0

Source: Authors' calculations based on MIRAGE simulations.

Notes: Intra-EU trade flows are excluded. ASEAN indicates the Association of Southeast Asian nations; ANZCERTA, the Australia and New Zealand group; LICs, low-income countries; and MICs, middle-income countries.

As illustrated by the Canadian case, tariff changes—either generated by a country's own policy reform or that of other countries—may have different, even opposite, effects on welfare. Decomposition of the mechanisms that affect welfare is crucial to understanding the results. In particular, it is important to assess the strength of the “what I do is what I get” argument. Indeed, in the context of changing global trade policy, a country will be affected both by changes in its own tariffs (domestic policy effect) and by changes in its partners' tariffs (the foreign policy effect). Due to intracountry reallocation of resources, imported inputs, and the model closure (that is, the fixed current account), it is difficult for us to speak about “import-led effects” and “export-led effects.” Both domestic and foreign policy effects have negative and positive outcomes. As previously stated, for a domestic tariff increase we have (a) a positive effect on welfare related to the “optimal tariff” argument, and (b) a negative effect on welfare led by increasing distortions in domestic economies; while for a foreign tariff increase we have (a) a positive effect on exporters benefiting from preferences on increasingly protected markets, and (b) a negative effect on exporters facing increased barriers.

Figure 3. Relative impacts of foreign and domestic policies on welfare results, Up-to-the Max scenario



Source: Authors' calculations based on MIRAGE simulations.

Notes: LIC indicates low-income countries; MIC, middle-income countries; ANZCERTA, the Australia and New Zealand group; and MENA, the Middle East and North Africa.

Keeping in mind that the CGE effects are not additive and that any decomposition is path-dependent, we use a methodology aimed at reducing this issue (Laborde 2009) to compute normalized relative effects of “domestic” and “foreign” reform. As is clear from Figure 3, in the case of Up-to-the Max scenario, we see that different countries respond differently to these conflicting effects. Several large countries/groups of countries (Canada, ASEAN, Brazil, India, EU27 European Union 27 countries, and so on) can benefit from their own tariff increases. On the other hand, in some small countries, recent adoptions of highly distorting trade policies mean that a return to high tariffs would be detrimental.

For most exporters, tariff increases on destination markets will have drastic negative effects and will dominate the welfare changes. This is particularly true for Asian countries (e.g., China and Japan) that have no preferential access. Except for a few countries that benefit from large preferential access (e.g., Canada and Mexico), the overall rise in protection at the global level still delivers positive effects: the increased value of existing preferences outweighs the loss of market access in third countries.

Table 7. Changes in factor remunerations for three scenarios compared with baseline, 2025 (percent)

Country/ grouping	Real return to capital			Real return to land			Skilled real wages			Unskilled real wages in agriculture			Unskilled real wages in nonagriculture		
	DDA	Bound	Bound & DDA	DDA	Bound	Bound & DDA	DDA	Bound	Bound & DDA	DDA	Bound	Bound & DDA	DDA	Bound	Bound & DDA
ASEAN LICs	-0.2	-4.3	-8.8	0.9	-7.2	-8.8	0.4	-4.1	-7.6	0.8	-6.6	-8.9	0.4	-5.5	-9.4
ASEAN MICs	0.3	-5.4	-3.2	1.9	-6.7	-5.4	1.0	-6.1	-2.1	1.6	-7.5	-5.4	0.8	-7.4	-3.4
ANZCERTA	0.2	-0.4	0.1	3.3	-5.4	-1.6	0.2	-0.8	-0.2	3.3	-4.3	-0.8	0.1	-0.8	-0.2
Bangladesh	-0.5	-4.7	-4.8	6.8	10.8	10.8	-0.5	-6.0	-6.2	4.7	6.0	6.0	-0.9	-6.2	-6.3
Brazil	0.3	-2.0	-1.0	4.8	-10.3	-1.6	0.1	-0.5	0.2	4.2	-8.5	-1.8	-0.1	-2.0	-0.8
Canada	0.3	-0.2	-0.1	3.0	-3.8	-1.6	0.1	-0.2	0.1	1.9	-2.0	-0.2	0.1	-0.2	-0.1
Central Africa	0.0	-8.3	-8.1	-0.1	-4.5	-4.1	-0.0	1.4	1.8	0.0	-5.7	-5.1	-0.0	-2.6	-2.4
China, excluding Hong Kong	0.1	-0.1	-0.6	0.7	-0.1	0.0	0.5	-0.9	-0.2	0.6	-0.2	-0.0	0.5	-0.6	-0.2
European Union	0.2	-0.3	-0.1	-1.8	-0.1	-1.1	0.2	-0.8	-0.5	-1.9	-0.6	-1.3	0.2	-0.4	-0.2
India	-0.1	-2.9	-2.2	0.3	2.8	3.7	0.0	-5.3	-2.0	0.2	0.1	1.6	0.0	-4.4	-2.0
Japan	0.3	-0.0	0.0	-6.5	1.0	-2.4	0.5	-0.4	0.0	-5.2	0.8	-2.6	0.4	-0.3	0.0
Mexico	0.2	0.4	0.3	1.9	-1.1	-0.1	-0.1	-3.4	-1.2	1.3	-1.5	-0.3	-0.1	-2.6	-1.0
Middle East and North Africa	0.3	-1.6	-0.4	2.5	1.5	1.7	0.3	-2.4	-0.5	2.0	0.6	1.2	0.2	-2.0	-0.4
Pakistan	-0.2	-3.1	-1.9	0.7	0.8	1.1	0.1	-6.6	-7.6	0.6	-1.5	-1.2	0.1	-6.8	-6.7
Turkey	0.0	-2.9	-2.0	0.4	-0.0	-0.7	0.1	-1.4	-0.5	0.4	-0.6	-0.8	0.1	-2.0	-1.2
US	-0.2	0.0	0.2	-5.8	-1.4	-0.6	0.1	-0.3	-0.2	-2.7	-0.7	-0.2	0.1	-0.2	-0.1

Source: Authors' calculations based on MIRAGE simulations.

Notes: ASEAN indicates Association of Southeast Asian Nations; LIC, low-income countries; MIC, middle-income countries; and ANZCERTA, the Australia and New Zealand group. Real factor returns are computed as the nominal value deflated by the representative household price index.

Finally, we examine how the real remuneration of specific factors (e.g., unskilled agricultural labor) varies under the DDA, Up-to-the-Bound, and Bound&DDA scenarios (see Table 7). The objective here is simply to illustrate the differences in how some productive factors are affected by further liberalization of a country's economy or by a global resort to protectionism, and whether the "insurance scheme" discussed herein takes effect at these factor levels.

In agricultural countries, such as Australia, New Zealand, and Brazil, productive factors related to agriculture (such as land and unskilled agricultural labor) clearly support the DDA and oppose increased global protection to bound levels. In Brazil, for example, real remuneration of land and unskilled agricultural labor increases by 4.8 and 4.2 percent, respectively, if the DDA is implemented, whereas they decline by 10.3 percent and 8.5 percent, respectively, if the Up-to-the-Bound scenario is implemented. The DDA also provides insurance for land and unskilled agricultural labor in these countries; under the Bound&DDA scenario, remuneration declines, but to a lesser extent (1.6 and 1.8 percent, respectively, in the case of Brazil). The same mechanism works in Asian MICs and in Central Africa, where the DDA provides insurance for these poor countries by circumventing the negative effects of increased global protectionism.

In rich countries, such as Japan, Korea, and the EFTA (European Free Trade Association) countries, land and unskilled agricultural labor interests support increased protectionism and oppose further liberalization. In the case of the EU and the US, any reform will cause a decline in the real remuneration of these factors. Indeed, for the agricultural sectors in both regions, the DDA will have adverse effects (such as reduction in subsidies or protective tariffs), but tariff increases by trade partners will also hurt agricultural interests. In the case of the Up-to-the-Bound and Bound&DDA scenarios, the negative effects are smaller.

It is notable that in rich countries (e.g., Australia and New Zealand, Canada, the EU, Japan, and the US), skilled labor and capital generally support increased multilateral trade openness, which increases their real remuneration, and oppose increased protectionism, which reduces their real remuneration. The differences in the real remuneration resulting from these trade policies are less than those related to land and unskilled agricultural labor; this can be explained by differences in the degree of intersectoral mobility. These results are consistent with the traditional Heckscher-Ohlin-Samuelson framework.

What is Really at Stake?

Our present results provide a clear re-assessment of what is really at stake with regard to the Doha Round. A disagreement among WTO countries over the DDA would signal international noncooperation. If countries subsequently implement protectionist policies, the loss could be much greater. This exercise provides clear insight into what could be lost as a result of the failure of the DDA. A simple comparison reveals a potential loss of US\$1,171 bn in world trade. Not only would the failure of the DDA prevent an increase of US\$363 bn in world trade coming from new commitments on tariffs and domestic support, but a worldwide move toward protectionism would further cause world trade to contract by US\$808 bn if the highest duties applied during the 1995-2006 are implemented (a realistic scenario). If an increase in bound duties is the relevant reference point, the potential cost of a failed DDA reaches US\$2,262 bn in the volume of annual trade in 2025.

Moreover, the DDA will not only increase trade, it will also reinforce binding commitments and reduce existing bound duties. As such, it will function for international public good by making the trade environment more secure and decreasing the costs associated with potential trade wars. We demonstrate this by comparing the application of bound duties based on their current levels with those based on the level of bound duties implied under the DDA; this exercise indicates that the DDA is worth US\$809 bn in the volume trade and US\$184 bn in real income.¹⁹

Strikingly, these conclusions are especially true for poor countries. In terms of real income, if we consider the real value of DDA as an insurance policy against protectionism, about two-thirds of the global value of US\$184 bn (i.e., \$128 bn) represents benefits to developing countries (see the comparison of the Up-to-the-Bound and Bound&DDA scenarios in Table 4). For these reasons, the DDA should finally be considered as a Development Round.

¹⁹ Calculated as $184 = -169 - (-353)$ and $809 = -1090 - (-1899)$.

CONCLUSION

Recent studies assessing the potential impact of the DDA have concluded that a modest increase in world trade and real world income would result from its implementation. The present study, which is limited to tariffs and domestic support, does not invalidate these conclusions, but rather it examines the situation from a completely different perspective. The failure of a WTO agreement would be a clear sign of international noncooperation, triggering trade conflicts and litigation (especially between high-income and developing countries). Furthermore, it would be the first unsuccessful round despite being the first to focus on development and the first launched by the WTO.

In the present period of economic stagnation, the risk is high that this failure would provide WTO members with an incentive to pursue non cooperative strategies via the adoption of protectionist policies. In that case, the loss would be much greater than the mere US\$59 bn projected; there would be a large opportunity cost of failing to conclude the DDA.

This study concludes that if world leaders fail to reach a final agreement under the DDA, the potential loss will be at least US\$1,171 bn in foregone world trade if countries subsequently implement protectionist policies. Therefore, the stakes in Geneva are extremely high, and the July 2008 package should be considered the closest and most promising step toward a global development agenda in the current context of a world in turmoil.

Appendix A. Sector and Geographic Decomposition

Table A.1. Regional aggregation

Country/region	GTAP 7 code
Australia and New Zealand	nzl, aus
Bangladesh	Bgd
Brazil	Bra
Canada	Can
Central Africa	xac, xcf
China and Hong Kong	hkg, chn
European Union	roa, bgr, gbr, swe, esp, svn, svk, prt, pol, nld, mlt, lux, ltu, lva, ita, irl, hun, grc, deu, fra, fin, est, dnk, cze, cyp, bel, aut
ASEAN MIC	tha, phl, mys
India	Ind
Indonesia	Idn
Japan	Jpn
Korea	Kor
ASEAN LIC	xse, vnm, mmr, lao, khm, xea
Mexico	Mex
MENA	xnf, tun, mar, egypt
Nigeria	Nga
Pakistan	Pak
Rest of Eastern Africa	xec, uga, eth
Rest of Latin America	xcb, xca, pan, nic, gtm, cri, xsm, ven, ury, per, pry, ecu, col, chl, bol, arg
Rest of OECD	xef, nor, che
Rest of the world	xws, irn, geo, aze, arm, xsu, kgz, kaz, xer, xee, ukr, rus, hrv, blr, alb, xna, xoc
Rest of South Asia	xsa, lka
Rest of SADC	zwe, zmb, tza, moz, mus, mdg
Rest of ECOWAS	xwf, sen
South African Custom Unions	xsc, zaf, bwa, mwi
Chinese Taipei and Singapore	sgp, twn
Turkey	Tur
US	Usa

Notes: GTAP indicates the Global Trade Analysis Project; ASEAN, the Association of Southeast Asian Nations; LIC, low-income countries; MIC, middle-income countries; MENA, the Middle East and North Africa; OECD, the Organization for Economic Co-operation and Development; SADC, the South African Development Community; and ECOWAS, the Economic Community of West African States.

Table A.2. Sectoral aggregation

Sectors	GTAP7 code
Paddy and processed rice	pcr, pdr
Beverages and tobacco	b_t
Cereals	Gro
Food products	Frs
Cattle	Ome
Meat products	Ofd
Milk and dairy products	Nmm
Other agricultural products	Rmk
Plant-based fibers	wtr, gdt, ely
Sugar	osg, ros, obs, isr, ofi, cmn, cns, wtr, gdt, ely
Vegetables and fruit	Coa
Wheat	oil, coa
Chemical products	cmt, oap
Electronics	omt, cmt, oap
Forestry and fishery	i_s, nmm
Leather	mp, nfm, i_s, nmm
Machinery	omt, cmt, oap
Mineral and metal products	Osd
Motor vehicles and transport equipment	Omf
Petroleum and coal products	Coa
Primary products	Pdr
Textiles	Tex
Wearing and apparel	atp, wtp, otp, trd
Wood and paper	Wap
Other manufactured products	ros, obs, isr, ofi, cmn, cns, wtr, gdt, ely
Other services	c_b
Transport and trade	Lum

Note: GTAP indicates the Global Trade Analysis Project.

Appendix B. Modeling the OTDS Constraint in a Dynamic Setting

As discussed in Section 3, we introduce the OTDS capping in the dynamic model. Compared with the standard approach, whereby domestic support is calculated from a base-year level and converted to an ad-valorem equivalent,²⁰ we find that account for production value growth in the agricultural sector reduces the subsidy rate to respect the new WTO commitments. Focusing on agricultural production and exports, the following can be inferred:

1. The EU is virtually unaffected by subsidy reductions thanks to the recent CAP reform and the large share of green box payments in overall EU domestic support. In contrast, application of OTDS limits to US farmers will benefit EU producers and exporters. Overall, EU production under DDA tariff reduction contracts less with the OTDS treatment than without it (-1.17 percent compared with -1.27 percent).
2. The situation in Brazil is magnified compared with that of the EU, in that Brazilian production increases more under the OTDS treatment (4.03 percent to 3.78 percent).
3. US production is directly affected by domestic support reduction (-1.5 percent in agricultural and agribusiness production instead of 0.1 percent). Moreover, for some sectors, the gaps arise from an expansion of the sugar and wheat sectors by 1 and 1.4 percent, respectively, to a contraction by -4 and -5.5 percent, respectively.

²⁰ Since current US domestic support is below the new OTDS limits, it does not reduce current policies.

Table B.1. Agricultural export and production variations under the DDA scenario, with and without dynamic OTDS constraints

	Brazil		European Union		US	
	Doha scenario					
	With constraints on OTDS	Without constraints on OTDS	With constraints on OTDS	Without constraints on OTDS	With constraints on OTDS	Without constraints on OTDS
A. Exports by volume, 2025 (deviation from the baseline, percent)						
Agriculture and agrofood	2.69	2.65	0.69	0.69	1.73	1.96
Beverage and tobacco	3.90	4.05	1.58	1.57	5.69	5.74
Cereals	−1.76	−3.93	−0.19	−0.87	−8.80	1.91
Food products	4.35	4.30	1.34	1.19	6.90	7.40
Cattle	−4.38	−5.97	2.50	1.67	−16.06	−0.32
Meat products	31.35	31.41	−1.75	−2.05	11.62	13.25
Milk and dairy products	69.66	68.54	−2.59	−3.06	−21.57	−15.70
Other agricultural products	1.46	0.09	4.18	2.99	−5.52	4.27
Paddy and processed rice	17.10	14.90	−7.38	−7.69	−6.21	2.96
Sugar	3.70	3.80	−25.58	−25.72	15.53	12.48
Vegetables and fruit	−1.28	−3.11	−0.29	−0.74	−6.27	2.74
Wheat	−5.80	−7.30	6.42	4.63	−6.84	1.23
B. Production by volume, 2025 (deviation from the baseline, percent)						
Agriculture and Agrofood	4.03	3.78	−1.17	−1.27	−1.50	0.10
Beverage and tobacco	−1.85	−1.69	0.02	0.03	0.17	−0.05
Cereals	0.43	0.45	0.28	0.28	−0.07	−0.04
Food products	3.88	3.30	−0.63	−0.86	−6.59	0.26
Cattle	0.98	0.92	−0.15	−0.18	0.17	0.41
Meat	12.07	12.07	−0.96	−1.11	−1.98	1.07
Milk and dairy products	14.40	14.43	−5.38	−5.49	1.00	1.26
Other agricultural products	1.94	1.90	−1.82	−1.89	−3.62	−2.57
Paddy and processed rice	0.79	0.15	−0.13	−0.56	−5.67	0.03
Sugar	0.30	0.21	−9.66	−9.99	−4.09	1.07
Vegetables and fruit	−0.14	−0.14	−0.00	−0.01	0.11	−0.04
Wheat	0.17	−1.79	1.59	1.12	−5.47	1.35

Source: Authors calculations based on MIRAGE simulations.
Note: OTDS indicates overall trade-distorting support.

Appendix C. Most favored nation tariff increases, 1995-2006

Table C.1. Frequency of increases in most favored nation tariffs, 1995-2006

Country	NAMA	AMA	ALL
Sudan	32.6	32.1	32.6
Qatar	24.8	20.2	24.2
Kuwait	24.7	20.1	24.1
Madagascar	21.4	21.1	21.4
Switzerland	19.2	26.0	20.1
Rwanda	19.5	10.2	18.3
Uzbekistan	17.5	20.4	17.9
Kyrgyzstan	17.4	20.4	17.8
Argentina	17.3	15.6	17.1
Nicaragua	15.3	18.9	15.7
Sri Lanka	14.3	24.6	15.7
Paraguay	15.4	10.8	14.7
Morocco	14.3	17.1	14.6
Uruguay	15.4	9.0	14.5
Bhutan	11.5	24.0	13.2
Lebanon	12.7	13.3	12.8
Congo	12.4	14.4	12.7
Afghanistan	11.0	16.9	11.8
India	11.2	15.3	11.8
Czech Republic	11.8	3.4	10.7
Moldova, Republic of	10.1	13.3	10.5
Nigeria	10.7	9.0	10.4
World	4.5	6.1	4.7
US	2.1	13.3	3.6
European Union	1.8	14.6	3.5
Japan	0.7	8.1	1.7
China	1.2	1.8	1.3

Source: TRAINS and authors' calculations.

Note: NAMA indicates nonagricultural market access and AMA, agricultural market access.

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