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## Fiscal Implications of Multilateral Tariff Cuts

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and Dustin Smith*

## **IMF Working Paper**

Policy Development and Review Department

### **Fiscal Implications of Multilateral Tariff Cuts**

**Prepared by Katrin Elborgh-Woytek, Jean-Jacques Hallaert, Hans Peter Lankes,  
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#### **Abstract**

**This Working Paper should not be reported as representing the views of the IMF.**

The views expressed in this Working Paper are those of the author(s) and do not necessarily represent those of the IMF or IMF policy. Working Papers describe research in progress by the author(s) and are published to elicit comments and to further debate.

The paper contributes to the discussion about the revenue implications of trade reform by assessing the approximate fiscal revenue impact of different liberalization formulae under consideration in multilateral trade negotiations for a group of low- and middle-income countries. The study applies a linear optimization framework to data for bound tariffs, applied tariffs, and imports at the HS-6 digit level for 58 developing countries, and simulates results for different sets of import demand elasticities and developing country “flexibilities.” While only a small number of countries face a significant impact, results point toward the need for complementary fiscal measures in the countries most affected by revenue loss.

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## I. INTRODUCTION

Trade liberalization is associated with higher economic growth (Berg and Krueger, 2003).<sup>2</sup> Indeed, since the 1980s, globalizers among developing countries achieved higher growth rates than non-globalizers (Dollar and Kraay, 2002). However, although the evidence of a close correlation between openness and growth is strong, the causality remains controversial due to measurement difficulties, problems of endogeneity, and the correlation between openness and other variables such as the quality of institutions and growth-supporting infrastructure.<sup>3</sup>

Reluctance toward trade liberalization has also been founded on shorter-term concerns about the impact of trade liberalization on fiscal revenue (Bevan, 1995; Blejer and Cheasty, 1990), in particular in countries that rely heavily on customs duties and other trade taxes.<sup>4</sup> Accordingly, the potential fiscal implications of trade liberalization have been the subject of discussion in the context of the World Trade Organization (WTO) Doha Round,<sup>5</sup> and featured prominently in other negotiations, such as those between the European Union and developing countries on Economic Partnership Agreements (EPAs).

The impact of tariff cuts on a particular country is largely an empirical issue, as it depends inter alia on the initial trade value and tariff level; the size and mode of the tariff cut; and import demand and supply elasticities. While the effects of trade liberalization may include a decline in revenue from trade taxes, such an outcome is not unavoidable. Studies indicate that the net effect of trade liberalization on revenue, including second-round effects, could be positive,<sup>6</sup> since (i) a reduction in tariffs could lead to higher import volumes, as a result of both income and substitution effects;<sup>7</sup> (ii) demand could shift to items with higher tariff rates as a result of an income effect; (iii) a depreciation of the exchange rate following trade liberalization could raise the value of imports and tariff revenues in local currency; and, (iv) over the longer term, revenue would be expected to increase as a result of higher economic growth, normally associated with trade liberalization.

Moreover, beyond the reduction in tariffs, the liberalization of the trade regime can involve a variety of measures, some of which would be revenue neutral or even serve to raise revenue (Ebrill, 1999). In particular, a conversion of non-tariff barriers (NTB) such as quotas, bans,

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<sup>2</sup> Winters (2004); Alcalá and Ciccone (2001); Choudri and Hakura (2000); Frankel and Romer (1999); Frankel, Stein, and Wei (1998); Krueger (1998); Anderson and Neary (1996); Barro and Sala-i-Martin (1995); and Grossman and Helpman (1991). A detailed overview of the literature on trade and growth is given in Srinivasan (2001).

<sup>3</sup> In their review of the literature, Rodriguez and Rodrik (1999) conclude that the question of causality between openness and growth has not been resolved. See also Rodrik, Subramanian, and Trebbi (2002) and, for an overview, Baldwin (2003).

<sup>4</sup> Trade taxes are generally considered inefficient in raising revenue, as they apply to a narrow base and distort both consumption and production decisions (Whalley and ab Iowerth, 2002). See also Farhadian-Lorie and Katz (1988) on the distortionary character of trade taxes, and Abed (1998) on trade liberalization and tax reform.

<sup>5</sup> See Section II B.

<sup>6</sup> IMF (2005).

<sup>7</sup> The import response to lower tariffs can be expected to be the most pronounced for consumer goods, for which demand elasticities tend to be high, and lower for materials and intermediate goods.

and import licenses into tariffs would generate additional revenue, and administrative reforms could entail efficiency gains in customs administration. However, as the occurrence of NTBs has declined markedly, there is now less leeway to replace NTBs with customs duties in order to increase revenue from trade taxes (Table 1). The impact of trade liberalization on tariff revenue is also determined by the extent of exemptions and preferences, and tariff revenue would increase to the extent that exemptions are reduced or abolished. Incentives to smuggle or misrecord would be reduced if tariffs were lowered or consolidated in the interest of greater transparency, thereby improving compliance and broadening the tax base (Fisman and Wei, 2004; Greenaway and Milner, 1991).

**Table 1. Tariff Lines Subject to Non-tariff Barriers in Developing Countries, 1989–2000 1/**  
(In percent of total tariff lines)

Region	1989–94	2000
East Asia and the Pacific	30.1	5.5
Latin America and the Caribbean	18.3	15.3
Middle East and North Africa	43.8	8.5
South Asia	57.0	13.3
Sub-Saharan Africa	26.0	2.3

Source: World Bank (2004).

1/ Regional averages of share of tariff lines subject to core NTBs, including quantitative restrictions, price administration, and monopolistic trading channels.

In the framework of multilateral trade liberalization, the difference between bound tariff rates<sup>8</sup> (the subject of WTO negotiations) and applied statutory (most favored nation—MFN) tariff rates is also critical: in cases where applied rates are significantly lower than bound rates, the latter can be lowered in the context of trade liberalization agreements without a significant impact on revenue.<sup>9</sup> However, in the event that trade liberalization took place in a bilateral/regional rather than in a multilateral (MFN) context, revenue could be affected negatively if bilateral or regional trade agreements diverted imports from dutiable to preferential sources, although the net effect of this would require detailed analysis. Accordingly, the net impact of trade liberalization measures depends critically on a range of assumptions. While first-round effects are relatively easy to quantify, both the timing and the strength of second-round effects, reflecting behavioral responses to the change in trade policies, are more difficult to project. Only some of these effects can be simulated sensibly across countries.

Developing countries rely on import duties to a much larger extent than industrial countries. In African least developed countries (LDCs), import duties represented about 34 percent of total government revenue over the period 1999–2001, and exceeded 50 percent in a number

<sup>8</sup> A negotiations-based commitment to an upper limit of a tariff rate.

<sup>9</sup> The impact of exemptions and preferences can be proxied by the ratio of the collected tariff rate to the trade weighted average MFN rate (which would be one in the absence of exemptions, preferences or outright tariff evasion). The ratio indicates the scope of revenue recovery by eliminating exemptions, preference, and evasion.

of countries. In case trade taxes are included in the base of domestic taxes on imports, the reduction in trade taxes is usually accompanied by a reduction in VAT revenue, and it may also lead to a reduction in excises.

This paper contributes to the discussion on the revenue implications of trade reform by assessing the approximate fiscal revenue impact of liberalization formulae under consideration in the WTO for 58 low- and middle-income countries. Section II provides background information on trade negotiations under the GATT, the Uruguay Round, and the Doha Round. The relevant literature is summarized in Section III. Methodological aspects and the simulation results are presented in Section IV, as are country experiences with the rebalancing of fiscal revenue loss resulting from trade liberalization. The policy recommendations in Section V address the countries most affected by a decline in revenues.

## **II. BACKGROUND**

### **A. Negotiations under the GATT and the Uruguay Round**

Over the past 25 years, trade liberalization has resulted in a sharp decline in the overall importance of revenue derived from customs duties and trade taxes. Reflecting commitments under trade liberalization agreements, as well as unilateral decisions, the collected import tariff rate<sup>10</sup> fell by almost half since the mid-1980s. The trend has been most pronounced in low-income countries; however, even middle- and high-income countries experienced a sharp decline in the share of trade-derived revenue to GDP (IMF, 2005).

Since 1947, seven negotiation rounds under the GATT resulted in significant tariff reductions, although not covering trade in agricultural goods. Initially, the tariff negotiations under the GATT followed the request-and-offer procedure, under which members negotiated bilateral market access concessions which were subsequently extended to all members according to the MFN principle. Under the Kennedy Round (1963–67), a linear formula approach was introduced, resulting in a 50 percent cut of bound tariffs on all manufactured goods with the exception of “sensitive” goods, such as steel, clothing, textiles and footwear. Moreover, the negotiation agenda was extended beyond tariffs to anti-dumping measures. With the Tokyo Round (1973–79), negotiations on non-tariff measures<sup>11</sup> gained importance.

Under the Uruguay Round (1987–94), all original GATT articles were reviewed and the WTO was established. The negotiation agenda was significantly expanded and covered trade in agriculture, textiles and apparel, and services.<sup>12</sup> Key outcomes included the replacement of non-tariff barriers with bound tariffs, and the elimination—after a transition period—of quotas in textiles trade. The Agreement on Agriculture comprises specific binding commitments to improve market access and to reduce production-and trade-distorting

<sup>10</sup> Actual tariff rate, once exemptions, preferences, and tariff evasion have been taken into account.

<sup>11</sup> Government procurement, import licensing, subsidies, anti-dumping, customs valuation, and technical standards.

<sup>12</sup> The Uruguay Round also covered a number of new rules (e.g., on trade-related aspects of intellectual property rights), the establishment of a dispute settlement system, and other issues not directly relevant to this paper.

domestic support and export subsidies; it also introduces a tariff rate quota<sup>13</sup> and special safeguards provisions.<sup>14</sup> However, despite these results, agricultural tariffs remained high<sup>15</sup> and complex, with a considerable dispersion, and tariff escalation prevails in important product chains. Agreements on “Special and Differential Treatment” were reached providing longer implementation periods and lower reduction commitments for developing countries.

The later rounds of trade negotiations demonstrated the superiority of a formula-based approach that limits the role played by special interest groups and enables the effective participation of smaller countries that would not be able to conduct bilateral negotiations effectively. The 35 percent reduction in average tariffs resulting from the Kennedy Round, based on a 50 percent proportional formula, compares favorably with the average reduction of tariffs by 2.5 percent in the second through the fifth rounds of GATT negotiations under the request-and-offer approach (Francois and Martin, 2003).

Negotiations under the Uruguay Round brought about substantial tariff reductions, based on broad goals, such as a 36 percent average reduction of tariffs on industrial products. However, the round was less successful in reducing tariff dispersion as it left the distribution of the cuts across sectors to negotiations between trading partners. Formulae that would have harmonized tariffs in addition to reducing averages were proposed but not adopted—such as the Swiss formula<sup>16</sup> that had originally been put forward by Switzerland in the Tokyo Round negotiations. The Swiss formula narrows the range of final tariff rates from a wide set of initial tariffs by applying steeper cuts to higher tariffs, while fixing a maximum final rate. It maintains the simplicity of a linear formula, requiring negotiations over only one coefficient, while reducing higher tariffs by more in both absolute and relative terms.

## B. The Doha Round

Negotiations on the Doha Development Agenda began in November 2001 with the aim to agree on liberalization and rules in agricultural, industrial and services trade, with special consideration of the needs of developing countries. First substantive results were reached at a WTO General Council meeting in Geneva in July 2004, which adopted framework agreements for establishing modalities in the different negotiating areas (“July Framework”),<sup>17</sup> including, crucially, agreements on the reduction of tariffs and domestic (agricultural) subsidies using *harmonizing formulae*, and the discontinuation of export subsidies.

At the sixth Ministerial Conference of the WTO in Hong Kong SAR in December 2005, trade ministers reached agreement on several outstanding issues but did not converge fully on

<sup>13</sup> Provision of market access at a zero or low tariff for a fixed quantity of a product, while additional quantities could be charged a higher tariff.

<sup>14</sup> Made available for countries that converted their non-tariff barriers to tariff-only regimes; allows importers to increase tariffs above the bound rate in response to a surge in imports or a sharp decline in import prices.

<sup>15</sup> The world-wide simple average of agricultural bound (applied) tariffs is estimated at 62 (17) percent, compared to 29 (9) percent for industrial products (OECD, 2004).

<sup>16</sup> The formula is defined as  $Z = AX/(A+X)$ , with  $X$  = initial tariff rate;  $Z$  = resulting lower tariff rate; and  $A$  = coefficient and maximum final tariff rate.

<sup>17</sup> See below for details on the July Framework.



negotiating modalities. The text on market access in agriculture goes slightly beyond the July Framework in adopting the principle of four tariff bands subject to progressively higher cuts, but fails to specify the thresholds of the bands and the size of the cuts. Absolute tariff caps were proposed by some (EU, United States, and G-20<sup>18</sup>) but rejected by others (G-10<sup>19</sup>). It was agreed that “sensitive products” can be excluded from formula cuts—though there would still need to be greater effective market access—and that developing countries can also make use of “special product” designations and a “special safeguard mechanism.”<sup>20</sup> Regarding non-agricultural market access (NAMA), the Ministerial adopted a Swiss formula approach while reaffirming less than full reciprocity and special flexibilities for developing countries. The Ministerial also made progress in some other areas, e.g., setting a 2013 deadline for eliminating agricultural export subsidies and reaching agreement on duty-and-quota-free access to industrial country markets for products from LDCs. In a statement relevant to this paper, the final declaration also calls for greater clarity on the scope of the problem of tariff revenue dependency.<sup>21</sup>

### III. OVERVIEW OF THE LITERATURE

The literature provides a range of assessments of the likely overall effect of trade liberalization on revenue. Ebrill, Stotsky, and Gropp (1999) and Agbeyegbe, Stotsky, and WoldeMariam (2004) conclude that the revenue impact of trade liberalization for a sample of selected developing and emerging market economies tends to be limited. Overall, revenue tends to be least affected if the initial position of the trade regime is highly restrictive and if liberalization is accompanied by reforms in customs and tax administration, also with the aim to broaden the tax base. The revenue impact is reduced if measures involve the tariffication of quantitative restrictions; the auctioning of licenses; a reduction in tariff dispersion; and the elimination of exemptions. (Ebrill, Stotsky, and Gropp 1999)

By contrast, Khattry and Rao (2002) find that the impact of trade liberalization on revenue is significantly negative. For the period 1978–99, they posit that trade liberalization in developing countries resulted in revenue losses due to the inability to compensate for foregone tariff revenue by raising higher revenue from domestic sources.

Fisman and Wei (2004) analyze the relationship between tariff rates and evasion based on export data from Hong Kong SAR and import data from China, finding a fall in tariff evasion of 3 percent for each percentage point of reduction in the average tariff rate. On a similar note, Pritchett and Sethi (1993) find a nonlinear relationship between statutory tariff rates and collected rates, indicating that incentives for misreporting increase with higher tariff rates.

<sup>18</sup> The G-20, formed in 2003 for the WTO negotiations, comprises Argentina, Bolivia, Brazil, Chile, China, Cuba, Egypt, Guatemala, India, Indonesia, Mexico, Nigeria, Pakistan, Paraguay, Philippines, South Africa, Tanzania, Thailand, Uruguay, Venezuela, and Zimbabwe.

<sup>19</sup> In the context of WTO negotiations, the G-10 is composed of Bulgaria, Taiwan Province of China, Korea, Iceland, Israel, Japan, Liechtenstein, Mauritius, Norway, and Switzerland.

<sup>20</sup> For an analysis of the special safeguard mechanism see Hallaert (2005).

<sup>21</sup> Hong Kong Ministerial Declaration (WT/MIN(05)/DEC).

An OECD analysis of the impact of trade liberalization on 24 developing economies reaches the conclusion that countries with higher and more dispersed tariff barriers, while being well positioned to benefit from a tariff reform, are also more vulnerable to revenue loss. Depending on the initial levels of tariffs and binding overhangs,<sup>22</sup> the trade, welfare and revenue impact of tariff reductions were found to differ considerably; while countries with higher initial tariffs and a lower binding overhang record a larger revenue loss, their welfare gains derived from trade creation are likely more substantial. Simulations of tariff cuts based on a Swiss formula with a coefficient of 10 point to a strong negative correlation between the trade and the revenue effects, i.e., the countries affected the most by revenue loss also experience the most significant trade creation. (OECD, 2004).

Analyzing a sample of 66 developing countries during 1974–98, Combes and Saadi-Sedik (2006) find that policy-induced trade openness results in an overall strengthening of government revenue.

#### **IV. SIMULATION OF THE FISCAL REVENUE IMPACT OF TARIFF LIBERALIZATION**

##### **A. Methodology**

The study simulates the fiscal impact of different trade liberalization formulae under the Doha Round for a sample of 58 developing countries. The sample includes all low- and middle-income WTO member countries, for which data for the bound tariff, applied tariff, and imports for 2001 or later years are available at the requisite level of detail.<sup>23</sup> The classification of countries by income and region is shown in Table 2. For the purpose of this study, data from the WITS database<sup>24</sup> at the HS-6 digit level (5,113 tariff lines) were used. The simulations are limited to first round effects and do thus not take into account any possible compensation for revenue losses through second round effects. Section D provides a quantitative perspective on the possible impact of higher GDP growth resulting from trade liberalization on fiscal revenue. Moreover, the simulations do not consider existing tariff exemptions that would limit the impact of tariff cuts.<sup>25</sup> Accordingly, they are testing the maximum loss in fiscal revenue based on statutory rates.

<sup>22</sup> Differences between bound and applied MFN tariffs.

<sup>23</sup> The initial sample included 67 developing WTO member countries. However, following the exclusion of actual or prospective EU members, the sample size was reduced to 58 countries (see Appendix Table 1).

<sup>24</sup> The World Integrated Trade Solution (WITS) database, compiled by the World Bank in close cooperation with UNCTAD, provides trade and tariff related statistical information, as well as some simulation and analysis tools. [http://wits.worldbank.org/witsnet/StartUp/Wits\\_Information.aspx](http://wits.worldbank.org/witsnet/StartUp/Wits_Information.aspx)

<sup>25</sup> While exemptions could have an impact on simulation results for selected countries, information on exemptions is patchy in aggregate, and unavailable on a line-item basis.

**Table 2. Classification of Sample Countries by Income and Region**

Classification of Countries	By Income
Low income	16
Low-middle income	24
Middle-high income	18
By Region	
Asia-Pacific	9
Europe	3
Middle East and Central Asia	6
Sub-Saharan Africa	16
Western Hemisphere	24
Total	58

Source: IMF staff.

Following the initial analysis of data adequacy, several adjustments were made:

- For 19 percent of tariff lines, on average, data for bound tariffs were not available, but data on applied tariffs existed. In these cases, mark-ups of 5 and 30 percentage points (to test sensitivity) were added to applied rates in order to construct an artificial “bound” tariff, in line with proposals reviewed in Annex B to the Hong Kong Ministerial Declaration.
- For 0.7 percent of tariff lines, bound tariffs were available, while applied tariffs were not. In these cases, the applied tariff was set according to the ratio of the average not-missing bound and applied tariff.
- 0.8 percent of tariff lines had neither bound nor applied tariffs. In these cases the applied rate was set to zero, and the bound rate was set with the 5 and 30 percentage point mark-up.

Formula reductions were made to bound tariffs at the HS-6 digit level of classification. In the simulations, the reduced bound tariffs were compared to the current statutory applied MFN tariff, and the lower of the two was used to calculate the projected revenue. Tariff cuts for agricultural goods were simulated for different sets of import demand elasticities, based on tariff allocation into four bands with progressively higher reduction coefficients, and applying different levels of tariff capping and sensitive product exclusions. It was assumed that countries would classify as sensitive products those tariff lines that carry most revenues (i.e., the selection criterion would be strictly fiscal, not reflecting trade policy concerns).

NAMA simulations were also run for different sets of import demand elasticities, by applying Swiss formula cuts and allowing for flexibilities for developing countries in line with Annex B, paragraph 8, of the July Framework. This paragraph grants the right (i) to exclude from formula reductions a maximum of 5 percent of tariff lines up to a total not

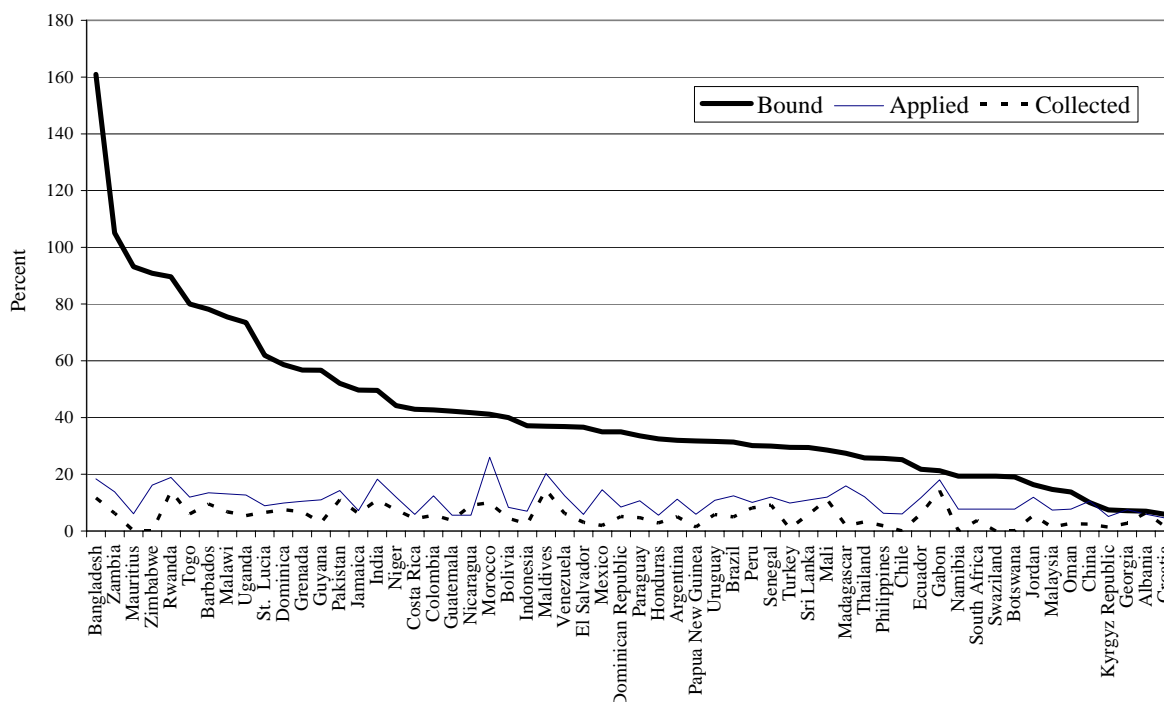
exceeding 5 percent of imports; or (ii) to apply only half the formula cut to 10 percent of tariff lines not exceeding 10 percent of imports. Calculating revenue loss for the “5/5” and the “10/10” scenarios required identifying commodity lines that countries would choose to exclude in order to minimize the revenue loss. For this purpose, we computed the hypothetical revenue loss for each HS-6 commodity line, assuming full tariff cuts. We chose lines to be exempted from tariff cuts by minimizing the sum of revenue loss across non-exempt commodity lines subject to the dual constraints of paragraph 8 (a standard integer optimization problem), using the CPLEX solver integrated into GAMS (General Algebraic Modeling System).

### **B. Structure of tariff revenue in the sample**

The analysis of initial conditions demonstrates that revenue is concentrated in tariff lines for non-agricultural goods, which account for an average of 78 percent of tariff revenue, largely because of a considerably higher import share in these categories of goods. However, for Bangladesh, tariff revenue from imports of agricultural products accounts for 59 percent of total tariff revenue, while it is equivalent to almost half the total tariff revenue for Papua New Guinea and Senegal. For other countries, such as Argentina, Brazil, Chile, Indonesia, Malaysia, and South Africa, the share of tariff revenue on agricultural imports is in the single digits. However, on average, agricultural tariffs are considerably higher than tariffs on non-agricultural products (Appendix Table 2). While the simple (trade weighted) average applied MFN tariff for non-agricultural products amounts to 9.8 (9.2) percent, it is equal to 16.5 (16.1) percent for agricultural products (Appendix Table 3).

Average bound tariffs remain substantially higher than applied tariffs, at 57.8 percent for agricultural products and 34.0 percent for non-agricultural products (Appendix Table 3). The “water” (i.e., margin) between bound and applied rates varies greatly between countries, as depicted in Figure 1 (see also Appendix Table 4). Since formula reductions are made to bound rates, this implies that the same reduction coefficient can have a very different impact on different countries.

Effectively collected tariffs, in turn, are generally lower than applied tariffs. Due to exemptions and tariff preferences, collected tariff rates amount to only 5.9 percent on average, compared to the trade-weighted average MFN tariff of 10.1 percent (for all products and countries; Appendix Table 3). For several countries (including China, Croatia, El Salvador, Honduras, Indonesia, Jamaica, Kyrgyz Republic, Malaysia, Oman, and Uganda), collected tariffs equal less than half of trade-weighted average MFN tariffs. In the cases of Georgia and Guyana, this ratio is less than one third, while it is as low as 20 percent for Madagascar, Mexico, and Turkey. While it is difficult to obtain detailed country-specific information on exemptions, this should be considered when interpreting the results of this study; specifically, the presence of exemptions reduces the fiscal impact of tariff reduction compared with statutory losses, and cutting exemptions offers opportunities for mitigating the decline in revenue.

**Figure 1. Average Bound, Applied, and Collected Tariff Rates**

Source: IMF staff.

The concentration of tariff revenue in the tariff lines with the highest protection is significant (Appendix Tables 5 and 6). As shown in Appendix Table 5, the 0.5 percent of tariff lines with the highest protection account for 45 percent of total tariff revenue on average, ranging from 23 percent for Uruguay to 71 percent for the Kyrgyz Republic. The 1 and 2 percent of tariff lines with the highest protection account for 54 percent and 66 percent on average, respectively. Tariff revenue derived from specific categories of products such as cars, tobacco, and alcohol, amounts to 0.1 to 0.2 percent of GDP on average, but is significantly higher in individual cases (Appendix Table 7). Similarly, while imports of oil account for 12.5 percent of total imports on average, tariff revenue from oil imports amounts to only 0.3 percent of GDP. However, such revenue is significant for selected countries, such as Malaysia (2.4 percent), Jamaica (2.0), Zimbabwe (2.1), and Guyana (1.8).

### C. Results

We simulated the revenue impact of trade liberalization based on five pairs of market access formulae for agriculture and NAMA, as proposed under the Doha Round. Simulations for four of these pairs are summarized in Box 1, but would appear to be less relevant at the current stage of the negotiations.

The following detailed analysis is based on the formula structures outlined in the July Framework (WTO document WT/L/579) and in the Hong Kong Ministerial Declaration (WT/MIN(05)/DEC).

- For agriculture: The July package indicated that tariff reductions would be made through a tiered formula applied to bound rates and that “progressivity in tariff reductions will be achieved through deeper cuts in higher tariffs with flexibilities for sensitive products.” The July package also made clear that LDCs would be exempted from any reduction obligations. However, the July package left open to negotiation the “number of bands, the thresholds for defining the bands, and the type of tariff reduction in each band,” as well as “the role of a tariff cap in a tiered formula with distinct treatment for sensitive products.” The Hong Kong Ministerial Declaration clarified that four bands will be used for structuring tariff cuts, but WTO members were not able to agree on the relevant thresholds.
- For industrial goods: The July package indicated that NAMA tariff lines would be cut using a non-linear formula applied to bound tariffs on a line-by-line basis. An exemption from tariff cuts was agreed for members with a binding coverage of non-agricultural tariff lines of less than 35 percent provided that they agree to bind these tariffs. Some flexibility was granted to developing countries in the form of the “5/5” and “10/10” provisions described in Section IV.A. above. Finally, as for agriculture, LDCs are not expected to cut their tariff rates. The Hong Kong Ministerial Declaration clarified that the non-linear formula would be a Swiss formula and that, for commodity lines that had not been bound previously, a non-linear mark-up approach would be used to derive bound rates, to which tariff reductions would be applied.

For coefficient values, we drew on the EU and G20 agriculture proposals of October 2005,<sup>26</sup> namely:

- 40 percent cut of bound rates higher than 130 percent;
- 35 percent cut of bound rates between 80 and 130 percent;
- 30 percent cut of bound rates between 30 and 80 percent;
- 25 percent cut of bound rates lower than 30 percent.

For NAMA, we simulated results for four coefficients that fall in the range of Swiss formula coefficients (ranging from 10 to 25) currently under consideration.

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<sup>26</sup> EU proposal of October 28, 2005 (“Making Hong Kong a Success: Europe’s Contribution” [http://trade-info.cec.eu.int/doclib/cfm/doclib\\_section.cfm?sec=109&lev=2&order=date](http://trade-info.cec.eu.int/doclib/cfm/doclib_section.cfm?sec=109&lev=2&order=date)), and G-20 proposal of October 12, 2005. This proposal is in the middle of the range reported in the draft possible formula for developing countries: [30-slightly less than 90] percent cut of bound rates higher than [60–150]; [25-slightly less than 85] percent cut of bound rates between [40–100] and [60–150]; [20-slightly less than 75] percent cut of bound rates between [20–50] and [40–100]; and [15-slightly less than 65] percent cut of bound rates lower than [20–50]. The U.S. proposal remains unspecific with regard to the treatment of developing countries.

### Box 1. Selected Tariff Reduction Scenarios<sup>1</sup>

#### 1. Linear Uruguay Round formula: bound tariffs reduced by 36 percent

Some early proposals such as the 2000 EU proposal on agriculture (WTO document G/AG/NG/W/90) suggested to continue with the Uruguay Round approach, i.e., an average 36 percent cut in bound tariffs with a minimum 15 percent cut for each tariff line. Our first simulation applied a 36 percent tariff cut to all bound tariff lines (agricultural and non- agricultural), with and without a capping of agricultural tariff lines at 100 percent, and with and without exempting LDCs and countries that have bound less than 35 percent of industrial tariff lines. Tariff losses in this scenario would average 20 percent, most pronounced among low-middle-income countries, in particular in the Middle East and Central Asia and in Asia. However, most LDCs would face a decline in tariff revenue of less than 1 percent. The application of exemptions granted to countries with less than 35 percent of their industrial tariff lines bound would lead to an insignificant decline in tariff revenue losses on average.

#### 2. U.S. proposals of 2002-03

Agricultural products: Swiss formula on applied tariff, coefficient 25

Industrial products: Swiss formula on bound tariff, coefficient 8; rates below 5 percent reduced to zero.

The implementation of this proposal (WTO document TN/MA/W/18) would result in substantial tariff revenue loss for all countries, with an average loss of 73 percent of revenue, and 70 percent of revenue in case exemptions from tariff cuts were applied. The impact for the 10 countries most exposed to revenue loss would be severe, as indicated by an average loss of tariff revenue of 82 percent, taking into account exemptions.

Overall, losses would be concentrated among the lower middle-income group, while exemptions would reduce the revenue loss experienced by African countries.

#### 3. Combination of Harbinson proposal for agriculture with Swiss formula for NAMA

Agricultural products:

- Rate > 120 percent: reduction by 40 percent
- Rate between 60 and 120 percent: reduction by 35 percent
- Rate between 20 and 60 percent: reduction by 30 percent
- Rate below 20 percent: reduction by 25 percent

Industrial products: Swiss formula on bound tariff, with a coefficient of 8

Under this proposal, all countries would experience a tariff revenue loss, with the average amounting to 59 percent of initial revenue. Losses in terms of GDP would average 2.3 percent, and low-income countries would experience slightly higher revenue losses than the other country groups.

#### 4. Pakistan proposal

In July 2005, Pakistan made the proposal (WTO document TN/MA/W/60) to apply a single Swiss formula to NAMA bound tariffs using as a coefficient the average tariff rate (one for developed and one for developing countries). For developing countries the coefficient would be 29. The simulation added to this formula a 5 percent reduction in bound tariff of agricultural goods, in order to attain an estimate of the entire tariff cut. In this scenario, tariff revenue loss, experienced by all countries, would average 30 percent of revenue, the equivalent of 1.2 percent of GDP. The revenue decline would vary widely by income group, between 22 percent of revenue for higher middle-income countries and 38 percent for low-income countries.

<sup>1/</sup> Based on data for 2001-04.

## Agriculture

As noted, our simulations are based on the coefficients proposed by the EU and the G-20. In order to account for remaining differences on capping and flexibilities we simulated:

- Four different levels of capping, i.e. maximum tariffs: capping at 75 percent (U.S. proposal), 100 percent, 150 percent (EU and G-20), and no capping (G-10 including Japan); and
- Four levels of sensitive product flexibilities: 1 percent (U.S. proposal), 2 percent, 4 percent, and 8 percent (EU proposal) of tariff lines are excluded from tariff cuts. As noted previously, in our simulation “sensitive products” were those associated with the highest pre-liberalization fiscal revenue.<sup>27</sup> Consistent with the July Framework and the Hong Kong Ministerial Declaration, tariffs are not cut for LDCs in the sample.

**Table 3. Summary of Results for Agricultural Tariff Cuts 1/**  
(Percent change in revenue from agricultural tariffs)

		No cap	150 percent cap	100 percent cap	75 percent cap
No flexibility	Simple average	-8.9	-9.4	-9.6	-10.6
	Weighted average	-23.2	-24.7	-25.7	-29.1
	<i>Loss in percent of GDP</i>	-0.08	-0.08	-0.08	-0.09
Flexibility 2/	1 percent of lines excluded	-3.4	-3.5	-3.5	-3.8
	2 percent of lines excluded	-2.3	-2.4	-2.4	-2.5
	4 percent of lines excluded	-1.4	-1.4	-1.4	-1.5
	8 percent of lines excluded	-0.7	-0.7	-0.7	-0.7

Source: IMF staff estimates.

1/ Assuming import demand elasticity of zero; exemptions for LDCs apply.

2/ Simple average.

Results under a scenario with import demand elasticities of zero are presented in Table 3. Absent capping, the weighted average revenue loss derived from cuts in agricultural tariffs would amount to 23 percent, while the simple average revenue loss would be less than 9 percent (equivalent to 0.08 percent of GDP). The significant difference indicates that “big countries” with a large share of revenue derived from agricultural imports would stand to lose more than other countries. For instance, China and Mexico would lose 48 and 32 percent, respectively, of tariff revenue on agricultural imports. When exemptions for LDCs are taken into account, the low-income countries in the sample would see their tariff revenue decline by only 3 percent, while the decline in middle-income countries would be about one quarter. Capping would have a significant impact only if set at a level below 100 percent.

<sup>27</sup> The flexibility is assumed to also apply to the cap, i.e., if a tariff line is exempt under the flexibility, the final tariff rate can be higher than the cap.



The assumption of an import demand elasticity of zero does not seem realistic as lower prices of imported goods following the tariff cut would trigger an increase in demand for these goods, thereby partially mitigating the revenue loss. Accordingly, country- and product-specific elasticities at the HS-6 digit level were introduced into the simulation, based on the estimates of Kee, Nicita, and Olarreaga (2004). The simulation results are summarized in Table 4. As expected, the introduction of elasticities would mitigate the revenue loss considerably. With the introduction of elasticities, the effect of capping is reduced significantly, since high tariffs can be virtually prohibitive and imports in these categories grow by more than the tariff declines.

**Table 4. Summary of Results for Agricultural Tariff Cuts 1/**  
(Percent change in revenue from agricultural tariffs)

		No cap	150 percent cap	100 percent cap	75 percent cap
No flexibility	Simple average	-5.8	-6.2	-6.4	-7.1
	Weighted average	-17.9	-18.3	-19.2	-21.3
	<i>Loss in percent of GDP</i>	<i>-0.04</i>	<i>-0.04</i>	<i>-0.04</i>	<i>-0.06</i>
Flexibility 2/	1 percent of lines excluded	-2.3	-2.4	-2.5	-2.6
	2 percent of lines excluded	-1.6	-1.6	-1.7	-1.7
	4 percent of lines excluded	-0.9	-1.0	-1.0	-1.0
	8 percent of lines excluded	-0.5	-0.5	-0.5	-0.5

Source: IMF staff estimates.

1/ Assuming import demand elasticities as in Kee et al. (2004); exemptions for LDCs apply.

2/ Simple average.

### *Non-Agricultural Market Access (NAMA)*

Simulations for NAMA were based on Swiss formula tariff cuts with different coefficients and take into account the flexibilities for developing countries described earlier.<sup>28</sup> While proposals for coefficients range from 8 to 30 and one proposal (by Argentina, Brazil, and India) postulates country-specific coefficients, we chose coefficients of 10, 15, 20, and 25, which seem representative of the range of possible outcomes. We also allowed for flexibilities for developing countries in line with Annex B, paragraph 8 of the July Framework, employing the methodology set out above in Section IV.A (“5/5” and “10/10” flexibilities). The proposals were tested both with an import demand elasticity of zero and with a demand response based on the import demand elasticities calculated by Kee, Nicita, and Olarreaga (2004) (Appendix Tables 8 and 9). However, unlike for agriculture, the choice of elasticities was shown to have only a moderate effect on the results, and is not reported here.

The projected revenue loss as a share of GDP for Swiss cut coefficients of 15, 20, and 25 is shown in Table 5 (see Appendix Table 10 for the full set of country-specific results). The average cut in the statutory tariff revenue for all developing countries in the sample ranges

<sup>28</sup> The simulation results presented assume a mark-up of 30 percentage points on applied tariff in order to construct artificial bound tariffs, in cases where the tariff line is not bound. In the negotiations, proposed mark-ups range from 5 to 30 percent.

from 0.3 percent of GDP for a Swiss formula coefficient of 25 and “10/10 flexibilities” to 0.8 percent of GDP assuming a coefficient of 15 and the absence of flexibilities. Average results are skewed upward by a few outliers in each income group: in the LDC-group, Maldives constitutes such an outlier with simulated fiscal revenue loss equivalent to 3½ percent of GDP even under the most benign of constellations. It is worth repeating, however, that according to the July Framework and the Hong Kong Ministerial Declaration, LDCs will not be expected to make formula cuts in their tariffs.

**Table 5. NAMA Products: Average Revenue Loss with Swiss Cut and Flexibilities**  
(In percent of GDP)

Swiss cut coefficient	No Flexibility			5/5 Flexibility			10/10 Flexibility		
	15	20	25	15	20	25	15	20	25
All Countries	0.8	0.6	0.5	0.6	0.4	0.3	0.5	0.4	0.3
Least developed countries o/w: (lowest two and highest two)	1.2	0.9	0.7	1.0	0.8	0.6	0.9	0.7	0.5
Togo	0.4	0.3	0.2	0.3	0.2	0.1	0.3	0.2	0.1
Niger	0.5	0.4	0.3	0.4	0.3	0.3	0.4	0.3	0.3
Malawi	0.8	0.5	0.4	0.6	0.5	0.3	0.5	0.4	0.3
Maldives	6.7	5.4	4.5	5.6	4.5	3.6	5.5	4.4	3.6
Other low income o/w: (lowest two and highest two)	0.7	0.5	0.4	0.5	0.3	0.3	0.4	0.3	0.3
Papua New Guinea	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Kyrgyz Republic	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Pakistan	0.5	0.3	0.3	0.3	0.2	0.1	0.2	0.1	0.0
Zimbabwe	3.0	2.5	2.1	2.3	1.8	1.5	2.2	1.8	1.6
Low-middle income o/w: (lowest two and highest two)	0.7	0.5	0.4	0.5	0.4	0.3	0.5	0.4	0.3
Bolivia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Philippines	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Jamaica	2.1	1.8	1.5	1.8	1.5	1.3	1.6	1.4	1.2
Morocco	2.3	2.0	1.8	2.0	1.7	1.5	2.0	1.8	1.6
High-middle income o/w: (lowest two and highest two)	0.7	0.6	0.4	0.4	0.3	0.2	0.4	0.3	0.2
Chile	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turkey	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Malaysia	1.6	1.3	1.2	0.6	0.5	0.4	0.5	0.5	0.4
South Africa	1.9	1.5	1.2	1.1	0.8	0.6	0.7	0.5	0.4

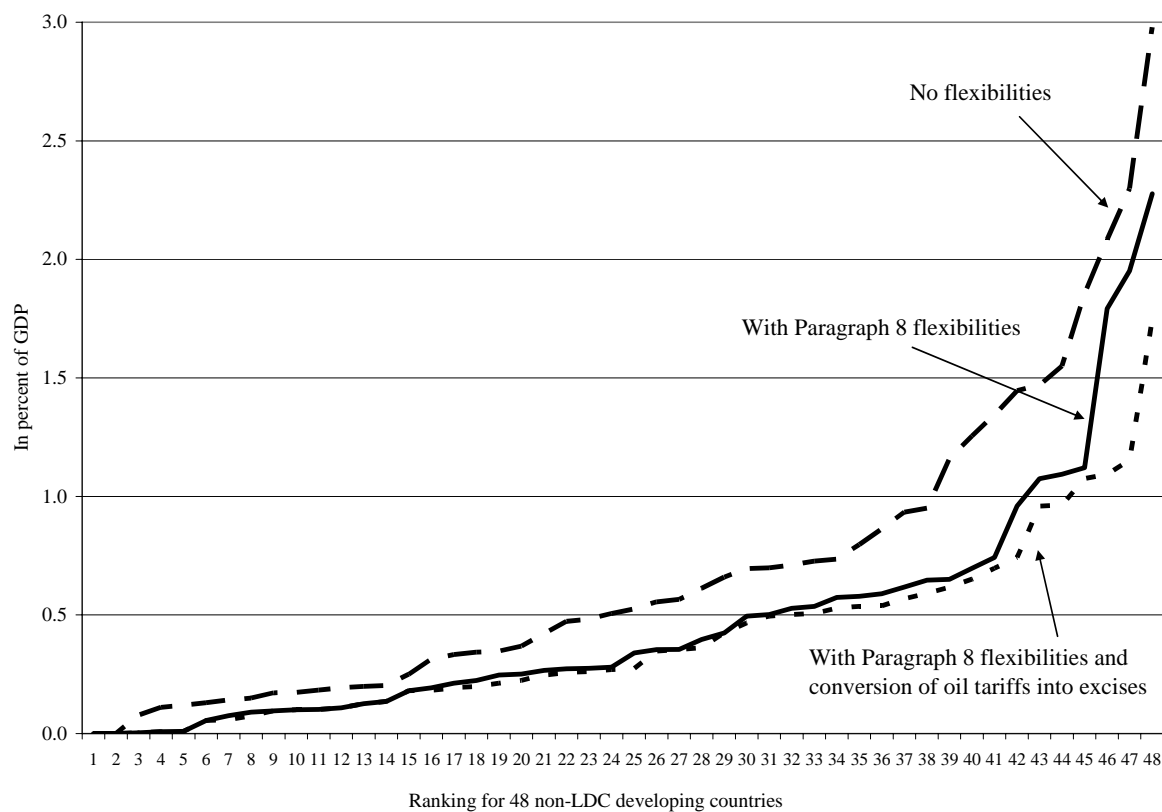
Source: IMF staff estimates.

A scenario with a coefficient of 15 is depicted in Figure 2, ranking the 48 non-LDCs in the sample by the size of the revenue impact of formula cuts (the results are reported in more detail in Appendix Table 10). The impact of formula cuts is significant relative to base-year revenue from import tariffs, but for the majority of countries very small relative to GDP. (Appendix Table 11 shows country-specific revenue losses in terms of original tariff revenue.)

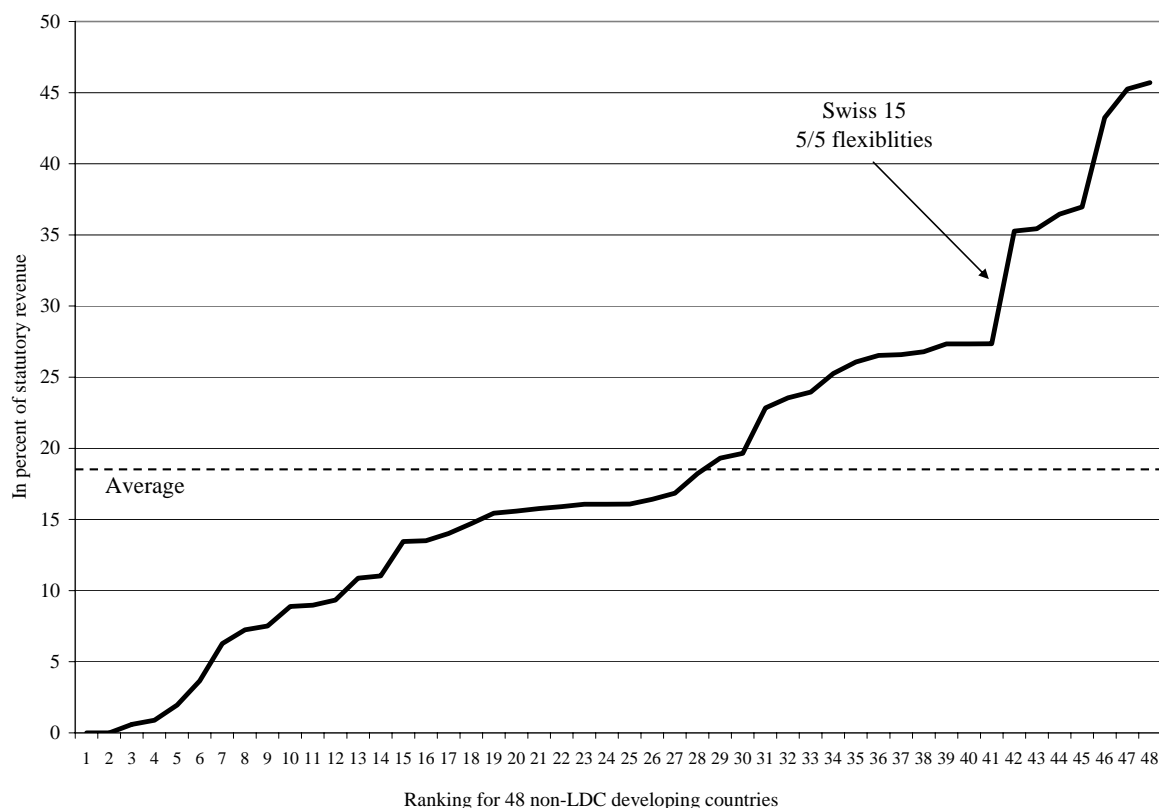
The simulations suggest that under the base line scenario, without flexibilities, assuming a NAMA Swiss formula coefficient of 15, about three quarters of the countries under analysis would experience a decline in tariff revenue of 30 percent or less of initial revenue. In less than 10 percent of the cases would the revenue loss exceed 1 percent of GDP, especially in a scenario in which tariffs on oil import are “converted” into excises that would be excluded

from reductions, since revenue from oil imports tends to be disproportionately important for the most revenue-sensitive countries. Still, for a minority of countries the revenue effects are clearly significant enough to warrant mitigating policies (see Figures 2 and 3).

**Figure 2. Loss of Tariff Revenue: NAMA Swiss Formula, 15 Coefficient** (In percent of GDP)



Source: IMF staff estimates.

**Figure 3. Loss of Tariff Revenue** (In percent of original tariff revenue)

Source: IMF staff estimates.

#### D. Growth simulations

In order to assess the possibility of recouping revenue losses arising from trade liberalization measures, we carried out additional simulations. To gain a rough numerical understanding of the orders of magnitude involved, we analyzed the average loss of revenue resulting from tariff reductions and developed a scenario that would allow the country to regain the pre-liberalization level of revenues. The scenario is based on data for the "average" country and a set of assumptions as outlined below.<sup>29</sup> For the representative country, the average applied tariff in the sample would fall from 10.7 percent to 8.2 percent, and the tax revenue-to-GDP ratio would fall from a pre-liberalization level of 19.5 percent to a post-liberalization level of 18.7 percent, resulting in fiscal revenue losses equivalent to  $\frac{3}{4}$  of a percent of GDP.

<sup>29</sup> The representative country, equivalent to the sample average of the 58 countries in the study, is characterized by a price elasticity of import demand of -1.68, and a pre-liberalization imports-to-GDP ratio of 34.6 percent.

**Table 6. Years Needed to Reach Pre-Liberalization Tax Revenue-to-GDP Ratio**

	$\varepsilon_T = 1.1$			$\varepsilon_T = 1.3$		
	$\Delta g = 0$	$\Delta g = 0.5$	$\Delta g = 0.75$	$\Delta g = 0$	$\Delta g = 0.5$	$\Delta g = 0.75$
$\varepsilon_I = 1.1$	10	9	8-9	4	3-4	3
$\varepsilon_I = 1.3$	8	7	6-7	3-4	3	3
$\varepsilon_I = 1.5$	6	5-6	5	3	3	2-3

Source: IMF staff estimates.

Table 6 presents the number of years it will take to regain the pre-liberalization ratio of tax revenue-to-GDP following the implementation of trade liberalization measures, under the assumption of a constant pre-liberalization nominal annual GDP growth rate of 4 percent. The table shows results for various assumptions regarding tax elasticity ( $\varepsilon_T$ ), income elasticity of imports ( $\varepsilon_I$ ), and additional annual GDP growth pick-up ( $\Delta g$ ) associated with trade liberalization.

As could be expected, the period of time needed to fully regain the pre-liberalization tax revenue-to-GDP ratio is the longest—10 years—in case no additional growth is assumed ( $\Delta g = 0$ ), and the income elasticity of imports ( $\varepsilon_I$ ) as well as the tax elasticity ( $\varepsilon_T$ ) are relatively low at 1.1. Increasing additional annual GDP growth to 0.75, tax elasticity to 1.3 and income elasticity of imports to 1.5 shortens the period of time needed to regain the pre-liberalization ratio of revenue to GDP to 2-3 years. It should be noted that the simulations do not imply a recovery of losses accumulated during the interim period.

## V. SUMMARY AND POLICY RECOMMENDATIONS

This paper responds to the declaration of the Hong Kong SAR Ministerial meeting calling for more analysis of the scope of the tariff dependency problem in the context of the Doha Development Agenda. It also constitutes an input to the Fund's bilateral and regional surveillance work, and indicates a potential need for assistance to selected member countries in embarking on trade reform.

### **Box 2. Experiences with Compensatory Tax Reform**

The experiences of different countries with the effects of tax reforms aimed at mitigating revenue loss from trade liberalization differ. Moreover, the assessment of these experiences also varies, depending on the methodology and the data sources used. Khattry and Rao (2002) underline the difficulties developing countries face in identifying and implementing adequate compensatory revenue measures. By contrast, Keen and Simone (2004) posit that revenue recovery has been almost complete.

In a detailed study, Baunsgaard and Keen (2005) analyze the implications of trade liberalization for revenue for 125 countries between 1975 and 2000. The results show substantial variations by income group:

- For low-income countries, revenue recovery remained low, at about 30 percent of lost trade tax revenue,<sup>1</sup> the result being independent of the application of a VAT over the short term. Non-linearity implied that recovery became less likely if the initial level of collected trade taxes was low.
- Middle-income countries showed a somewhat stronger record, with recovery ratios reaching 45 to 65 percent.
- By contrast, high-income countries demonstrated a recovery of lost trade taxes through domestic taxes of more than 100 percent, with the highest ratios reached by countries relying on VAT.<sup>2</sup>

Revenue recovery was reported to have been lower in the second half of the period under investigation. By region, recovery rates were the lowest in Asia and the Middle East. However, country experiences were found to have been rather diverse across regions.<sup>3</sup>

In several countries, trade liberalization was implemented in parallel with the introduction of the VAT, thereby achieving revenue neutrality. In this regard, country experiences point to the importance of a strong commitment to broadening the tax base and proper design and implementation of the VAT. Experience suggests that VAT systems complying with standard best practice of a single base, a reasonable threshold, and few exceptions, were best geared toward offsetting lost trade tax revenue.<sup>4</sup>

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1/ However, revenue recovery has been strong in some low-income countries, such as Benin, Cote d'Ivoire, Gambia, Malawi, Pakistan, and Zambia.

2/ The authors conclude that for this group of countries, with regard to trade taxes, protective motives dominated over revenue considerations.

3/ See also Greenaway and Milner (1991), and IMF (2005) for detailed case studies.

4/ Practical problems may, however, arise as domestic VAT collection faces stronger implementation difficulties than the collection of VAT on imports (the latter accounting for the major part of all VAT revenue in many developing countries).

The simulations of key proposals currently under discussion in the context of the Doha Round indicate that, under the baseline scenario (see above), only 10 percent of developing countries would face a loss in tariff revenue exceeding 1 percent of GDP. As agricultural imports account for only a small share of tariff revenue and the formulae under discussion would produce only moderate reductions in applied tariffs, the results are largely determined by NAMA liberalization.

Our simulations of multilateral trade liberalization measures suggest that most countries would face only minor fiscal pressures, of a magnitude that is likely to be mitigated by second-round effects. But a few countries may have to consider complementary reforms, such as the reform of non-tariff barriers, the reduction in exemptions, and perhaps a broader shift of taxation toward domestic taxes (see Box 2 for country experiences with tax reform measures, following trade liberalization). As second-round effects are subject to significant uncertainty as to their strength and timing, it is generally not prudent to presume that effects through exchange rate movements, inflation, or economic growth would automatically and immediately compensate for the direct loss of trade tax revenues.

A combination of measures to broaden the tax base, strengthen tax administration, and reduce exemptions could achieve the intended revenue compensation. If domestic indirect tax rates are raised to a level that leaves end prices for consumers unchanged, there would be efficiency gains from aligning domestic producer prices closer with world market prices.<sup>30</sup> Moreover, government revenue would likely increase as the domestic tax would be imposed on the consumption of domestic as well as imported goods.<sup>31</sup> Vice versa, the reform could aim to compensate the revenue loss exactly, in which case indirect tax rates and thus consumer prices could be reduced. Welfare gains could be maximized by combining the shift away from trade taxes with a move toward a uniform system of consumption taxes (IMF, 2005).

Additional reductions in impact could be attained by transforming some import tariffs into excises, thereby excluding them from tariff reductions. The collection of both sales tax and excise could be based on the administrative infrastructure developed for trade tax collection, as a significant share would continue to be imposed on imports and collected at the border. Adding to the attractiveness of the proposed shift from a practical point of view, the sales tax could be expected to cover the informal sector in the same way as tariffs do.

As efficiency gains from trade liberalization would likely lead to an increase in aggregate real incomes, additional government revenue could be derived from higher income taxes (Blejer and Cheasty, 1990; IMF, 2005). Overall, policies should be based on mutual reinforcement of trade reform, domestic tax reform, and sound macro policies.

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<sup>30</sup> For small economies, Keen and Ligthart (2002) recommend an increase in domestic consumption taxes of somewhat less than one-for-one with tariff cuts, as this would leave consumers better off, preserve the production efficiency gain from tariff cuts, and increase government revenue (as consumption provides a wider tax base than imports).

<sup>31</sup> Governments could choose to use the additional revenue to offset the negative impact of trade liberalization on certain sectors or industries through either tax incentives or subsidies.

## REFERENCES

- Abed, George T., 1998, "Trade Liberalization and Tax Reform in the Souther Mediterranean Region," IMF Working Paper 98/49 (Washington: International Monetary Fund).
- Agbeyegbe, Terence, Janet G. Stotsky, and Asegedech WoldeMariam, 2004, "Trade Liberalization, Exchange Rate Changes, and Tax Revenue in Sub-Saharan Africa," IMF Working Paper 04/178 (Washington: International Monetary Fund).
- Alcalá, Francisco, and Antonio Ciccone, 2001, "Trade and Productivity," CEPR Discussion Paper No. 3095 (London: Centre for Economic Policy Research).
- Anderson, James E., and Peter J. Neary, 1996, "A New Approach to Evaluating Trade Policy," *The Review of Economic Studies*, Volume 63, January, pp. 107–25.
- Baldwin, Robert E., 2003, "Openness and Growth: What's the Empirical Relationship?," NBER Working Paper 9578 (Cambridge, Massachusetts: National Bureau of Economic Research).
- Barro, Robert J., and Xavier Sala-i-Martin, 1995, "Technological Diffusion, Convergence, and Growth," NBER Working Paper No. 515 (Cambridge, Massachusetts: National Bureau of Economic Research).
- Baunsgaard, Thomas, and Michael Keen, 2005, "Tax Revenue and (or?) Trade Liberalization," IMF Working Paper 05/112 (Washington: International Monetary Fund).
- Bevan, David, 1995, "Fiscal Implications of Trade Liberalization," IMF Working Paper 95/50 (Washington: International Monetary Fund).
- Berg, Andrew, and Anne Krueger, 2003, "Trade, Growth, and Poverty: A Selective Survey," IMF Working Paper 03/30 (Washington: International Monetary Fund).
- Blejer, Mario, and Adrienne Cheasty, 1990, "Fiscal Implications of Trade Liberalization," in *Fiscal Policy in Open Developing Economies*, ed. by Vito Tanzi (Washington: International Monetary Fund).
- Choudri, Ehsan U., and Dalia S. Hakura, 2000, "International Trade and Productivity Growth: Exploring the Sectoral Effects for Developing Countries," Staff Papers, International Monetary Fund, Vol. 47, No. 1.
- Combes, Jean-Louis, and Tahsin Saadi-Sedik, 2006, "How Does Trade Openness Influence Budget Deficits in Developing Countries?," IMF Working Paper 06/3 (Washington: International Monetary Fund).
- Dollar, David, and Aart Kraay, 2002, "Trade, Growth, and Poverty," Policy Research Working Paper No. 2615 (Washington: World Bank).



- Ebrill, Liam, Janet Stotsky, and Reint Gropp, 1999, *Revenue Implications of Trade Liberalization*, IMF Occasional Paper No. 180 (Washington: International Monetary Fund).
- European Union (EU), 2005, "Making Hong Kong a Success: Europe's Contribution." Available via the Internet: [http://trade-info.cec.eu.int/doclib/cfm/doclib\\_section.cfm?sec=109&lev=2&order=date](http://trade-info.cec.eu.int/doclib/cfm/doclib_section.cfm?sec=109&lev=2&order=date)
- Farhadian-Lorie, Ziba, and Menachem Katz, 1988, "Fiscal Dimensions of Trade Policy," IMF Working Paper 88/44 (Washington: International Monetary Fund).
- Fisman, Raymond, and Shang-Jin Wei, 2004, "Tax Rates and Tax Evasion: Evidence from "Missing Imports" in China," *Journal of Political Economy*, Vol. 112, No. 2, pp. 471–96.
- Francois, Joseph F., and Will Martin, 2003, "A Formula for Success? Potential Approaches to Market Access Negotiations," *World Economy*, Vol. 26, Issue 1 (January), pp. 1–28.
- Frankel, Jeffrey A., and David Romer, 1999, "Does Trade Cause Growth?" *American Economic Review*, Vol. 89 (June), pp. 379–99.
- Frankel, Jeffrey A., Ernesto Stein, and Shang-Jin Wei, 1998, "Continental Trading Blocs: Are they Natural or Supernatural?," *The Regionalization of the World Economy*, ed. by A. Frankel, University of Chicago for the NBER.
- Greenaway, David, and Chris Milner, 1991, "Fiscal Dependence on Trade Taxes and Trade Policy Reform," *Journal of Development Studies*, Vol. 27, pp. 95–132.
- Grossmann, Gene M., and Elhanan Helpman, 1991, *Innovation and Growth in the Global Economy*, Cambridge, Massachusetts: The MIT press.
- Hallaert, Jean-Jacques, 2005, "Special Agricultural Safeguards: Virtual Benefits and Real Costs—Lessons for the Doha Round," IMF Working Paper 05/131 (Washington: International Monetary Fund).
- International Monetary Fund (IMF), 2005, "Dealing with the Revenue Consequences of Trade Reform" (unpublished; Washington: International Monetary Fund Fiscal Affairs Department).
- Kee, Hiau Looi, Allesandro Nicita, and Marcelo Olarreaga, 2004, "Import Demand Elasticities and Trade Distortions," Policy Research Working Paper No. 3452 (Washington: World Bank).

- Keen, Michael, and Jenny E. Ligthart, 2002, "Coordinating Tariff Reduction and Domestic Tax Reform," *Journal of International Economics*, Vol. 56, Issue 2, March, pp. 489–507.
- , and Alejandro Simone, 2004, "Tax Policy in Developing Countries: Some Lessons from the 1990s, and Some Challenges Ahead," in *Helping Countries Develop: The Role of Fiscal Policy*, ed. by Sanjeev Gupta, Ben Clements, and Gabriela Inchauste, (Washington: International Monetary Fund).
- Khattry, Barsha, and J. Mohan Rao, 2002, "Fiscal Faux Pas? An Analysis of the Revenue Implications of Trade Liberalization," *World Development*, Vol. 30, Issue 8 (August), pp. 1431–44.
- Krueger, Anne O., 1998, "Why Trade Liberalisation is Good for Growth," *The Economic Journal*, Vol. 108, pp. 1513–22.
- OECD/Working Party of the Trade Committee, 2004, "Impact of Changes in Tariffs on Developing Countries' Government Revenue," TD/TC/WP(2004)29, Paris.
- Pritchett, Lant, and Geeta Sethi, 1993, "Tariff Rates, Tariff Revenue, and Tariff Reform: Some New Facts," Policy Research Working Paper WPS 1143 (Washington: World Bank).
- Rodriguez, Francisco, and Dani Rodrik, 1999, "Trade Policy and Economic Growth: A Skeptic's Guide to the Cross-National Evidence," NBER Working Paper 7081 (Cambridge, Massachusetts: National Bureau of Economic Research).
- Rodrik, Dani, Arvind Subramanian, and Francesco Trebbi, 2002, "Institutions Rule: The Primacy of Institutions over Geography and Integration in Economic Development," IMF Working Paper 02/189 (Washington: International Monetary Fund).
- Srinivasan, T.N., 2001, "Trade, Development, and Growth," *Essays in International Economics* No. 225, Princeton, N.J.
- Whalley, John, and Aled ab Iowerth, 2002, "Efficiency Considerations and the Exemption of Food from Sales and Value Added Taxes," *Canadian Journal of Economics*, Vol. 35, No. 1, pp. 166–82.
- Winters, Alan L., 2004, "Trade Liberalisation and Economic Performance: An Overview," *The Economic Journal*, Vol. 114, No. 493, pp. F4–F21.
- World Trade Organization (WTO), 2005, "Hong Kong Ministerial Declaration" (WT/MIN(05)/DEC).
- , 2005, "Market Access for Nonagricultural Products: The Way Forward—Communication from Pakistan to the World Trade Organization" (TN/MA/W/60).

- , 2004, "Doha Work Programme—Decision Adopted by the General Council on August 1, 2004" (WT/L/579).
- , 2000, "European Communities—Comprehensive Negotiating Proposal" (G/AG/NG/W/90).
- , 2002, "Market Access for Non-Agricultural Products—Communication from the United States" (TN/MA/W/18).

Appendix Table 1. Country Classification and Year of Data Source

Country	Income Level	Imports	Tariffs
Albania	Low-Middle	2004	2005
Argentina	High-Middle	2004	2005
Bangladesh 1/	Low	2004	2004
Barbados	High-Middle	2004	2004
Bolivia	Low-Middle	2004	2005
Botswana	High-Middle	2001	2005
Brazil	Low-Middle	2004	2005
Chile	High-Middle	2004	2005
China	Low-Middle	2004	2004
Colombia	Low-Middle	2004	2005
Costa Rica	High-Middle	2004	2005
Croatia	High-Middle	2004	2004
Dominica	High-Middle	2004	2003
Dominican Republic	Low-Middle	2001	2004
Ecuador	Low-Middle	2004	2005
El Salvador	Low-Middle	2004	2005
Gabon	High-Middle	2004	2005
Georgia	Low-Middle	2004	2004
Grenada	High-Middle	2003	2003
Guatemala	Low-Middle	2004	2005
Guyana	Low-Middle	2004	2003
Honduras	Low-Middle	2003	2005
India	Low	2004	2005
Indonesia	Low-Middle	2004	2004
Jamaica	Low-Middle	2002	2003
Jordan	Low-Middle	2004	2005
Kyrgyz Republic	Low	2004	2003
Madagascar 1/	Low	2004	2005
Malawi 1/	Low	2004	2003
Malaysia	High-Middle	2004	2005
Maldives 1/	Low-Middle	2004	2004
Mali 1/	Low	2001	2004
Mauritius	High-Middle	2004	2005
Mexico	High-Middle	2004	2005
Morocco	Low-Middle	2004	2005
Namibia	Low-Middle	2003	2005
Nicaragua	Low	2004	2005
Niger 1/	Low	2003	2004
Oman	High-Middle	2004	2002
Pakistan	Low	2004	2005
Papua New Guinea	Low	2003	2005
Paraguay	Low-Middle	2004	2005
Peru	Low-Middle	2004	2005
Philippines	Low-Middle	2003	2005
Rwanda 1/	Low	2003	2005
Senegal	Low	2004	2004
South Africa	High-Middle	2004	2005
Sri Lanka	Low-Middle	2004	2005
St. Lucia	High-Middle	2004	2003
Swaziland	Low-Middle	2002	2005
Thailand	Low-Middle	2003	2005
Togo	Low	2004	2004
Turkey	High-Middle	2004	2003
Uganda	Low	2004	2005
Uruguay	High-Middle	2004	2005
Venezuela	High-Middle	2004	2005
Zambia	Low	2004	2005
Zimbabwe	Low	2004	2003

Sources:

Income level classifications used are from the World Bank.

Bound tariffs were obtained from the WTO CTS database.

Applied tariffs were obtained from UNCTAD using the WITS system.

Import data were obtained from the UN's COMTRADE dataset using the WITS system.

1/ Least developed country.

**Appendix Table 2. Distribution of Tariff Revenue**  
(In percent)

	Agricultural products	Industrial products
All Countries	22	78
Low-Income	27	73
Bangladesh	59	41
India	19	81
Kyrgyz Rep	29	71
Madagascar	22	78
Malawi	17	83
Mali	17	83
Nicaragua	26	74
Niger	25	75
Pakistan	27	73
Papua New Guinea	45	55
Rwanda	17	83
Senegal	44	56
Togo	22	78
Uganda	31	69
Zambia	11	89
Zimbabwe	26	74
Low-Middle Income	19	81
Albania	19	81
Bolivia	13	87
Brazil	6	94
China	12	88
Colombia	15	85
Dominican Republic	16	84
Ecuador	15	85
EL Salvador	35	65
Georgia	33	67
Guatemala	20	80
Guyana	27	73
Honduras	23	77
Indonesia	8	92
Jamaica	19	81
Jordan	25	75
Maldives	13	87
Morocco	23	77
Namibia	14	86
Paraguay	13	87
Peru	14	86
Philippines	20	80
Sri Lanka	27	73
Swaziland	34	66
Thailand	12	88
High-Middle Income	20	80
Argentina	2	98
Barbados	25	75
Botswana	25	75
Chile	8	92
Costa Rica	20	80
Croatia	18	82
Dominica	38	62
Gabon	30	70
Grenada	28	72
Malaysia	3	97
Mauritius	26	74
Mexico	17	83
Oman	35	65
South Africa	6	94
St. Lucia	33	67
Turkey	23	77
Uruguay	13	87
Venezuela	19	81

Source: IMF staff estimates.

Appendix Table 3. Average MFN Unweighted, Trade Weighted, Bound and Collected Tariffs

	Simple Average MFN Tariff			Trade Weighted Average MFN			Average Bound Tariff			Collected Tariff
	All products	Agricultural products	Industrial products	All products	Agricultural products	Industrial products	All products	Agricultural products	Industrial products	All products
All countries	10.7	16.5	9.8	10.1	16.1	9.2	41.2	57.8	34.0	5.9
Albania	6.0	7.4	5.7	7.5	7.4	7.5	7.0	8.4	6.8	6.4
Argentina	11.3	10.3	11.4	12.9	9.8	13.0	31.9	33.1	31.8	5.0
Bangladesh	18.4	22.1	17.8	19.8	24.2	18.7	161.0	184.9	88.5	11.7
Barbados	13.5	32.4	10.6	14.0	43.6	7.0	78.1	112.1	73.5	9.5
Bolivia	8.3	9.9	8.1	8.7	10.0	8.5	40.0	40.0	40.0	4.5
Botswana	7.7	7.4	7.8	9.9	15.7	8.8	19.0	41.7	16.0	...
Brazil	12.4	10.5	12.7	8.2	9.7	8.1	31.4	35.7	30.7	5.0
Chile	6.0	6.1	6.0	6.0	6.0	6.0	25.1	26.0	25.0	...
China	10.5	15.8	9.7	6.0	17.8	5.5	10.0	15.1	9.2	2.4
Colombia	12.4	17.7	11.6	11.4	15.7	10.9	42.7	84.6	36.1	5.5
Costa Rica	5.9	13.1	4.7	4.7	10.5	4.1	42.9	43.3	42.8	4.4
Croatia	4.6	9.3	3.9	4.2	8.5	3.8	6.0	9.8	5.4	1.7
Dominica	9.9	22.7	7.8	13.8	23.6	11.0	58.7	113.0	51.1	7.5
Dominican Republic	8.5	14.4	7.5	8.1	10.3	7.8	34.9	40.2	34.1	5.1
Ecuador	11.7	16.0	11.0	9.8	15.2	9.2	21.8	27.0	21.0	6.1
El Salvador	5.9	12.3	4.9	7.1	13.7	5.7	36.6	43.3	35.5	3.0
Gabon	18.0	23.4	17.2	16.9	20.7	15.6	21.3	53.0	16.3	14.2
Georgia	7.5	10.5	7.1	9.0	14.0	7.7	7.2	10.2	6.7	2.8
Grenada	10.4	19.9	8.9	11.5	17.7	10.1	56.8	92.3	51.1	6.9
Guatemala	5.6	10.5	4.8	6.7	10.5	6.1	42.3	51.3	40.8	3.8
Guyana	11.0	23.1	9.1	11.4	19.6	9.9	56.6	92.4	50.9	3.0
Honduras	5.6	10.7	4.8	6.9	9.9	6.3	32.5	32.6	32.5	2.8
India	18.3	38.3	15.1	14.6	66.3	12.3	49.6	115.6	35.9	11.0
Indonesia	7.0	8.2	6.8	6.1	6.1	6.1	37.1	46.9	35.5	2.5
Jamaica	7.2	19.2	5.3	14.2	17.0	13.7	49.6	90.3	43.2	6.2
Jordan	11.9	20.9	10.5	9.5	13.1	8.7	16.3	24.7	15.0	5.6
Kyrgyz Republic	5.1	8.1	4.7	4.3	9.2	3.5	7.4	12.3	6.6	1.3
Madagascar	15.9	20.7	15.1	10.7	16.6	9.7	27.4	30.0	25.7	1.9
Malawi	13.1	15.3	12.8	12.1	15.2	11.6	75.4	110.7	49.0	6.7
Malaysia	7.4	2.5	8.1	4.1	2.2	4.3	14.6	12.7	14.9	1.3
Maldives	20.2	17.4	20.6	20.1	13.8	21.6	37.0	50.8	35.1	14.7
Mali	12.0	15.0	11.5	10.9	14.3	10.4	28.5	57.6	16.6	11.0
Mauritius	6.1	10.1	5.4	4.6	6.2	4.2	93.1	119.3	45.3	...
Mexico	14.6	22.6	13.3	12.6	32.4	11.1	35.0	36.3	34.8	1.9
Morocco	26.0	50.2	22.2	24.0	32.4	22.3	41.2	54.4	39.1	10.0
Namibia	7.7	7.2	7.8	8.9	7.9	9.1	19.4	44.4	16.0	...
Nicaragua	5.6	11.4	4.7	5.9	10.6	5.1	41.7	43.4	41.5	9.1
Niger	12.0	15.0	11.5	12.8	15.4	12.2	44.2	81.3	38.1	7.5
Oman	7.7	12.2	7.0	7.0	11.4	5.8	13.8	28.2	11.5	2.8
Pakistan	14.3	16.1	14.0	14.4	37.2	11.7	52.0	101.2	36.2	11.0
Papua New Guinea	6.0	18.3	4.1	2.2	6.1	1.4	31.7	47.6	29.4	1.4
Paraguay	10.6	10.3	10.7	9.4	13.5	9.0	33.5	33.4	33.5	4.7
Peru	10.1	13.8	9.6	9.2	10.1	9.0	30.1	30.8	30.0	8.2
Philippines	6.2	10.1	5.6	3.3	9.1	2.8	25.6	36.5	23.3	1.8
Rwanda	18.9	15.4	19.4	19.4	22.9	18.9	89.6	75.7	91.8	14.0
Senegal	12.0	15.0	11.5	8.7	11.7	7.3	30.0	29.8	30.0	9.1
South Africa	7.7	7.2	7.8	5.1	5.3	5.1	19.4	44.4	16.0	3.7
Sri Lanka	10.9	22.4	9.2	7.4	16.3	6.1	29.4	49.9	18.4	5.9
St. Lucia	8.9	18.2	7.4	13.8	16.4	12.8	61.9	115.9	53.6	6.5
Swaziland	7.7	7.6	7.8	12.5	20.2	10.4	19.4	44.4	16.0	...
Thailand	12.0	25.5	10.0	6.1	13.7	5.7	25.8	31.1	24.9	3.2
Togo	12.0	15.0	11.5	11.1	13.2	10.6	80.0	80.0	80.0	6.0
Turkey	9.9	47.1	4.1	4.8	18.2	3.9	29.5	64.8	17.7	0.9
Uganda	12.7	21.8	11.3	13.8	26.2	11.4	73.4	77.2	61.7	5.4
Uruguay	10.9	10.4	10.9	8.0	11.6	7.6	31.6	34.5	31.1	5.8
Venezuela	12.4	16.1	11.8	13.3	16.4	12.7	36.8	54.1	34.0	6.2
Zambia	13.8	20.0	12.9	9.8	16.7	9.3	105.1	123.0	64.9	6.2
Zimbabwe	16.2	25.0	14.7	18.1	24.8	16.5	90.9	127.8	31.8	...

Source: UNCTAD, WTO, and IMF staff estimates.

**Appendix Table 4. Average Gap Between Bound and Applied Tariffs**  
(In percent)

	All products	Agricultural product	Industrial products
All countries	30	41	25
Albania	1	1	1
Argentina	21	23	20
Bangladesh	142	164	76
Barbados	65	80	63
Bolivia	32	30	32
Botswana	10	26	8
Brazil	19	25	18
Chile	19	20	19
China	0	0	0
Colombia	30	67	24
Costa Rica	37	30	38
Croatia	1	0	2
Dominica	50	91	44
Dominican Republic	26	26	27
Ecuador	10	11	10
El Salvador	31	31	31
Gabon	3	30	0
Georgia	0	0	0
Grenada	47	72	42
Guatemala	37	41	36
Guyana	46	69	42
Honduras	27	22	28
India	31	76	21
Indonesia	30	38	29
Jamaica	42	71	38
Jordan	4	4	5
Kyrgyz Republic	2	4	2
Madagascar	13	10	15
Malawi	65	95	42
Malaysia	7	10	7
Maldives	17	33	15
Mali	16	42	5
Mauritius	85	107	43
Mexico	21	19	21
Morocco	15	4	17
Namibia	10	26	8
Nicaragua	36	32	37
Niger	32	66	27
Oman	6	16	4
Pakistan	38	87	23
Papua New Guinea	26	29	25
Paraguay	23	23	23
Peru	20	17	20
Philippines	20	26	18
Rwanda	71	60	72
Senegal	18	15	19
South Africa	10	26	8
Sri Lanka	16	28	10
St. Lucia	53	98	46
Swaziland	10	26	8
Thailand	13	7	14
Togo	66	65	72
Turkey	15	17	14
Uganda	56	56	57
Uruguay	21	24	20
Venezuela	24	38	22
Zambia	90	104	58
Zimbabwe	70	102	19

Source: IMF staff estimates.

**Appendix Table 5. Tariff Lines: Revenue Intensity**  
 (Percent of total tariff revenue derived from "x" percent of lines)

	0.5 percent of lines	1 percent of lines	2 percent of lines
All Countries	45	54	66
Albania	42	55	68
Argentina	62	68	74
Bangladesh	27	37	50
Barbados	69	75	81
Bolivia	35	46	58
Botswana	45	53	64
Brazil	24	34	46
Chile	37	45	55
China	39	48	58
Colombia	35	43	53
Costa Rica	43	53	65
Croatia	32	41	53
Dominica	46	57	70
Dominican Republic	46	56	66
Ecuador	36	45	55
El Salvador	43	54	67
Gabon	31	44	58
Georgia	63	71	79
Grenada	36	48	61
Guatemala	48	58	69
Guyana	53	62	73
Honduras	46	56	69
India	63	68	74
Indonesia	35	44	55
Jamaica	67	74	82
Jordan	49	59	70
Kyrgyz Republic	71	80	87
Madagascar	39	49	61
Malawi	28	40	54
Malaysia	43	53	65
Maldives	39	49	61
Mali	51	62	74
Mauritius	42	54	68
Mexico	38	46	56
Morocco	42	52	64
Namibia	41	51	63
Nicaragua	40	53	68
Niger	58	68	77
Oman	50	60	71
Pakistan	59	67	75
Papua New Guinea	50	64	79
Paraguay	45	56	67
Peru	41	49	59
Philippines	47	57	67
Rwanda	41	52	66
Senegal	45	54	66
South Africa	43	52	62
Sri Lanka	43	53	64
St. Lucia	37	50	64
Swaziland	51	61	70
Thailand	40	50	60
Togo	57	68	78
Turkey	42	54	66
Uganda	55	65	75
Uruguay	23	33	46
Venezuela	37	45	55
Zambia	36	47	60
Zimbabwe	62	69	76

Source: IMF staff estimates.



**Appendix Table 6. Tariff Lines: Revenue Intensity**  
(Percent of total tariff revenue derived from one percent of lines)

	All products	Agricultural products	Industrial products
All Countries	54	12	41
Albania	55	7	47
Argentina	68	1	66
Bangladesh	37	6	29
Barbados	75	53	20
Bolivia	46	8	38
Botswana	53	17	36
Brazil	34	3	31
Chile	45	4	41
China	48	8	40
Colombia	43	8	35
Costa Rica	53	8	44
Croatia	41	5	36
Dominica	57	18	34
Dominican Republic	56	5	50
Ecuador	45	7	37
El Salvador	54	11	37
Gabon	44	12	29
Georgia	71	21	47
Grenada	48	9	36
Guatemala	58	8	49
Guyana	62	15	45
Honduras	56	8	47
India	68	15	53
Indonesia	44	4	40
Jamaica	74	7	66
Jordan	59	11	46
Kyrgyz Republic	80	19	57
Madagascar	49	14	35
Malawi	40	7	33
Malaysia	53	2	50
Maldives	49	3	46
Mali	62	10	51
Mauritius	54	15	38
Mexico	46	9	36
Morocco	52	15	37
Namibia	51	6	45
Nicaragua	53	10	42
Niger	68	17	49
Oman	60	25	34
Pakistan	67	25	42
Papua New Guinea	64	22	36
Paraguay	56	7	49
Peru	49	7	42
Philippines	57	12	45
Rwanda	52	11	41
Senegal	54	23	25
South Africa	52	3	49
Sri Lanka	53	17	35
St. Lucia	50	9	36
Swaziland	61	27	34
Thailand	50	6	44
Togo	68	13	54
Turkey	54	10	41
Uganda	65	23	41
Uruguay	33	4	28
Venezuela	45	9	35
Zambia	47	5	42
Zimbabwe	69	19	48

Source: IMF staff estimates.

Appendix Table 7. Selected Imports: Contribution to Total Revenue and GDP

	Cars (HS 8702- 8703)	Tobacco (HS 24)	Alcohol (HS 2203- 2208)	Raw Sugar (HS 1701)	Rice (HS 1006)	Oil (HS 2709- 2710)	Cars (HS 8702- 8703)	Tobacco (HS 24)	Alcohol (HS 2203- 2208)	Raw Sugar (HS 1701)	Rice (HS 1006)	Oil (HS 2709- 2710)
	(In percent of total revenue) 1/						(In percent of GDP) 2/					
Average	8	2	1	1	1	8	0.2	0.1	0.1	0.1	0.0	0.3
Albania	8	3	1	1	0	6	0.2	0.1	0.0	0.0	0.0	0.1
Argentina	11	0	0	0	0	0	0.2	0.0	0.0	0.0	0.0	0.0
Bangladesh	7	1	2	1	0	0	0.0	0.0	0.0	0.0	0.0	0.0
Barbados	2	0	0	3	3	3	0.9	0.0	0.1	1.3	1.1	1.1
Bolivia	5	0	0	0	0	7	0.1	0.0	0.0	0.0	0.0	0.1
Botswana	13	3	1	11	0	0	0.2	0.1	0.0	0.2	0.0	0.0
Brazil	4	0	1	0	1	0	0.0	0.0	0.0	0.0	0.0	0.0
Chile	5	0	0	0	0	16	0.1	0.0	0.0	0.0	0.0	0.2
China	5	0	0	0	1	2	0.1	0.0	0.0	0.0	0.0	0.0
Colombia	13	1	1	0	1	1	0.2	0.0	0.0	0.0	0.0	0.0
Costa Rica	8	1	1	0	2	15	0.2	0.0	0.0	0.0	0.0	0.3
Croatia	12	0	1	0	0	6	0.2	0.0	0.0	0.0	0.0	0.1
Dominica	5	0	6	2	1	5	0.4	0.0	0.4	0.1	0.1	0.3
Dominican Rep.	12	0	1	0	0	15	0.2	0.0	0.0	0.0	0.0	0.2
Ecuador	10	0	1	0	0	1	0.2	0.0	0.0	0.0	0.0	0.0
El Salvador	8	1	3	0	1	12	0.2	0.0	0.1	0.0	0.0	0.2
Gabon	8	2	3	0	3	1	0.1	0.0	0.0	0.0	0.1	0.0
Georgia	9	6	0	3	0	13	0.2	0.2	0.0	0.1	0.0	0.3
Grenada	6	0	4	2	1	5	0.4	0.0	0.2	0.1	0.0	0.3
Guatemala	13	0	1	0	1	16	0.2	0.0	0.0	0.0	0.0	0.3
Guyana	6	5	5	1	0	22	0.5	0.4	0.4	0.1	0.0	1.8
Honduras	7	1	1	0	0	22	0.2	0.0	0.0	0.0	0.0	0.6
India	1	0	1	1	0	20	0.0	0.0	0.0	0.0	0.0	0.4
Indonesia	9	1	1	0	0	1	0.1	0.0	0.0	0.0	0.0	0.0
Jamaica	11	0	1	2	1	39	0.6	0.0	0.0	0.1	0.1	2.0
Jordan	7	6	1	1	0	15	0.3	0.3	0.0	0.1	0.0	0.6
Kyrgyz Republic	11	3	3	9	0	25	0.2	0.0	0.0	0.1	0.0	0.4
Madagascar	4	0	0	3	6	0	0.1	0.0	0.0	0.1	0.2	0.0
Malawi	9	4	1	1	0	1	0.2	0.1	0.0	0.0	0.0	0.0
Malaysia	11	0	0	0	1	1	0.4	0.0	0.0	0.0	0.0	0.0
Maldives	1	0	2	0	0	15	0.2	0.0	0.3	0.0	0.0	2.4
Mali	2	3	0	1	1	4	0.0	0.1	0.0	0.0	0.0	0.1
Mauritius	1	3	7	5	0	4	0.0	0.0	0.1	0.1	0.0	0.1
Mexico	13	0	0	0	0	1	0.4	0.0	0.0	0.0	0.0	0.0
Morocco	0	1	0	2	0	12	0.0	0.0	0.0	0.1	0.0	0.7
Namibia	21	2	2	0	0	2	0.4	0.0	0.0	0.0	0.0	0.0
Nicaragua	3	2	1	0	0	11	0.1	0.0	0.0	0.0	0.0	0.3
Niger	19	9	1	1	0	1	0.3	0.2	0.0	0.0	0.0	0.0
Oman	0	19	4	0	0	3	0.0	0.2	0.1	0.0	0.0	0.0
Pakistan	8	0	0	0	0	14	0.2	0.0	0.0	0.0	0.0	0.3
Papua New Guinea	0	0	0	1	0	0	0.0	0.0	0.0	0.0	0.0	0.0
Paraguay	11	4	3	0	0	1	0.4	0.2	0.1	0.0	0.0	0.0
Peru	3	0	0	1	1	21	0.0	0.0	0.0	0.0	0.0	0.2
Philippines	8	1	1	1	7	14	0.1	0.0	0.0	0.0	0.1	0.2
Rwanda	11	0	1	3	2	0	0.2	0.0	0.0	0.1	0.0	0.0
Senegal	0	1	1	1	11	5	0.0	0.0	0.0	0.0	0.3	0.1
South Africa	31	0	0	0	0	0	1.5	0.0	0.0	0.0	0.0	0.0
Sri Lanka	7	5	0	6	0	7	0.2	0.1	0.0	0.1	0.0	0.2
St. Lucia	8	2	6	1	1	0	0.5	0.1	0.4	0.1	0.0	0.0
Swaziland	8	1	2	0	0	0	0.3	0.0	0.1	0.0	0.0	0.0
Thailand	5	1	2	0	0	2	0.1	0.0	0.1	0.0	0.0	0.1
Togo	4	5	1	1	1	18	0.1	0.2	0.0	0.0	0.0	0.5
Turkey	0	2	0	0	1	4	0.0	0.0	0.0	0.0	0.0	0.0
Uganda	4	0	1	8	6	4	0.1	0.0	0.0	0.2	0.2	0.1
Uruguay	5	1	1	1	0	0	0.1	0.0	0.0	0.0	0.0	0.0
Venezuela	17	1	2	1	0	0	0.3	0.0	0.0	0.0	0.0	0.0
Zambia	5	0	0	0	1	6	0.1	0.0	0.0	0.0	0.0	0.2
Zimbabwe	7	9	0	0	0	24	0.6	0.8	0.0	0.0	0.0	2.1

Source: IMF staff estimates.

1/ Shaded cells indicate a contribution of more than 10 percent.

2/ Shaded cells indicate a contribution of 0.5 percent or more.

Appendix Table 8. Import Demand Elasticities for NAMA Products

	Average	Minimum	Maximum
Average	-1.7	-20.7	-0.4
Albania	-1.5	-14.9	-0.2
Argentina	-2.3	-37.4	-0.2
Bangladesh	-1.6	-34.4	-0.2
Barbados	-1.5	-11.3	-0.2
Bolivia	-1.5	-23.9	-0.3
Botswana	-1.6	-11.3	-0.3
Brazil	-2.9	-38.0	-0.7
Chile	-1.6	-30.4	-0.2
China	-2.2	-36.9	-0.2
Colombia	-1.8	-24.7	-0.2
Costa Rica	-1.5	-13.5	-0.2
Croatia	-1.4	-16.6	-0.2
Dominica	-1.6	-11.3	-0.7
Dominican Republic	-1.6	-11.3	-0.7
Ecuador	-1.6	-11.3	-0.7
El Salvador	-1.5	-23.8	-0.2
Gabon	-1.6	-11.3	-0.2
Georgia	-1.6	-11.3	-0.4
Grenada	-1.6	-11.3	-0.7
Guatemala	-1.5	-37.4	-0.3
Guyana	-1.6	-11.3	-0.7
Honduras	-1.5	-11.3	-0.2
India	-2.7	-37.9	-0.2
Indonesia	-1.9	-35.6	-0.2
Jamaica	-1.5	-11.3	-0.2
Jordan	-1.5	-15.6	-0.3
Kyrgyz Republic	-1.6	-11.3	-0.7
Madagascar	-1.5	-19.5	-0.3
Malawi	-1.5	-11.3	-0.4
Malaysia	-1.5	-23.3	-0.2
Maldives	-1.6	-11.3	-0.7
Mali	-1.6	-14.9	-0.7
Mauritius	-1.4	-16.3	-0.4
Mexico	-1.9	-37.9	-0.2
Morocco	-1.5	-28.9	-0.2
Namibia	-1.9	-37.8	-0.2
Nicaragua	-1.5	-11.3	-0.5
Niger	-1.6	-11.3	-0.5
Oman	-1.6	-11.3	-0.3
Pakistan	-1.6	-11.3	-0.7
Papua New Guinea	-1.6	-11.3	-0.7
Paraguay	-1.5	-18.0	-0.2
Peru	-1.8	-22.4	-0.2
Philippines	-1.6	-35.6	-0.2
Rwanda	-1.6	-11.3	-0.7
Senegal	-1.5	-15.6	-0.3
South Africa	-1.9	-37.8	-0.2
Sri Lanka	-1.5	-19.9	-0.2
St. Lucia	-1.6	-11.3	-0.7
Swaziland	-1.9	-37.8	-0.2
Thailand	-1.7	-37.8	-0.2
Togo	-1.6	-11.3	-0.6
Turkey	-1.8	-32.2	-0.2
Uganda	-1.5	-18	-0.2
Uruguay	-1.6	-25.8	-0.2
Venezuela	-1.8	-30.6	-0.2
Zambia	-1.5	-11.3	-0.2
Zimbabwe	-1.6	-11.3	-0.7

Source: Kee, Nicita, and Olarreaga (2004).

**Appendix Table 9. Import Demand Elasticities for Agricultural Products**

	Average	Minimum	Maximum
Average	-2.2	-17.0	-0.5
Albania	-1.8	-9.8	-0.6
Argentina	-3.1	-37.7	-0.2
Barbados	-1.8	-9.8	-0.4
Bolivia	-2.0	-30.2	-0.3
Botswana	-2.1	-10.9	-0.7
Brazil	-4.3	-37.7	-0.2
Chile	-2.3	-32.8	-0.3
China	-4.3	-36.6	-0.2
Colombia	-2.4	-27.5	-0.3
Costa Rica	-1.9	-23.0	-0.2
Croatia	-1.7	-18.5	-0.3
Dominica	-2.1	-9.8	-0.7
Dominican Republic	-2.1	-9.8	-0.7
Ecuador	-2.1	-9.8	-0.7
El Salvador	-1.8	-14.3	-0.4
Gabon	-1.9	-9.8	-0.5
Georgia	-2.0	-9.8	-0.4
Grenada	-2.1	-9.8	-0.7
Guatemala	-2.0	-22.6	-0.2
Guyana	-2.1	-9.8	-0.7
Honduras	-1.8	-9.8	-0.4
India	-3.2	-37.6	-0.2
Indonesia	-3.2	-37.2	-0.2
Jamaica	-1.8	-31.7	-0.5
Jordan	-1.8	-9.8	-0.6
Kyrgyz Republic	-2.1	-9.8	-0.7
Malaysia	-2.1	-28.9	-0.2
Mauritius	-1.8	-9.8	-0.3
Mexico	-3.2	-36.7	-0.2
Morocco	-2.1	-24.3	-0.4
Namibia	-2.1	-10.9	-0.7
Nicaragua	-1.9	-9.8	-0.7
Oman	-1.9	-21.9	-0.3
Pakistan	-2.1	-9.8	-0.7
Papua New Guinea	-2.1	-9.8	-0.7
Paraguay	-2.1	-9.8	-0.7
Peru	-2.1	-9.8	-0.7
Philippines	-2.1	-9.8	-0.7
South Africa	-2.1	-10.9	-0.7
Sri Lanka	-2.1	-9.8	-0.7
St_ Lucia	-2.1	-9.8	-0.7
Swaziland	-2.1	-10.9	-0.7
Thailand	-2.1	-9.8	-0.7
Turkey	-2.1	-9.8	-0.7
Uruguay	-2.1	-9.8	-0.7
Venezuela	-2.1	-9.8	-0.7
Zimbabwe	-2.1	-9.8	-0.7

Source: Kee, Nicita, and Olarreaga (2004).

**Appendix Table 10. NAMA Products: Average Revenue Loss with Swiss Cut and Flexibilities**  
(In percent of GDP)

Swiss Cut	No Flexibility				5/5 Flexibility				10/10 Flexibility			
	10	15	20	25	10	15	20	25	10	15	20	25
Albania	0.9	0.7	0.6	0.6	0.7	0.6	0.5	0.4	0.7	0.6	0.5	0.5
Argentina	1.0	0.7	0.5	0.3	0.8	0.5	0.3	0.2	0.8	0.5	0.3	0.2
Bangladesh	1.0	0.7	0.5	0.4	0.9	0.6	0.5	0.3	0.8	0.6	0.4	0.3
Barbados	1.8	1.3	0.9	0.6	1.2	0.7	0.4	0.2	1.0	0.6	0.4	0.2
Bolivia	0.2	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.2	0.0	0.0	0.0
Botswana	0.7	0.5	0.4	0.3	0.5	0.4	0.3	0.2	0.4	0.3	0.2	0.2
Brazil	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.0	0.2	0.1	0.0	0.0
Chile	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
China	0.7	0.6	0.5	0.4	0.4	0.4	0.3	0.3	0.5	0.4	0.4	0.3
Colombia	0.5	0.3	0.2	0.2	0.4	0.2	0.1	0.1	0.3	0.2	0.1	0.1
Costa Rica	0.3	0.1	0.0	0.0	0.2	0.1	0.0	0.0	0.1	0.0	0.0	0.0
Croatia	0.7	0.5	0.4	0.4	0.5	0.4	0.3	0.3	0.5	0.4	0.4	0.3
Dominica	1.8	1.3	1.0	0.8	1.0	0.6	0.3	0.2	0.9	0.5	0.3	0.2
Dominican Republic	0.4	0.3	0.1	0.1	0.3	0.2	0.1	0.0	0.2	0.1	0.0	0.0
Ecuador	0.8	0.6	0.5	0.4	0.7	0.5	0.4	0.3	0.6	0.4	0.3	0.2
El Salvador	0.4	0.2	0.1	0.0	0.3	0.1	0.0	0.0	0.2	0.1	0.0	0.0
Gabon	0.8	0.7	0.6	0.5	0.7	0.6	0.5	0.4	0.7	0.6	0.6	0.5
Georgia	0.9	0.7	0.6	0.5	0.8	0.6	0.5	0.5	0.8	0.6	0.6	0.5
Grenada	1.5	0.9	0.5	0.3	1.2	0.7	0.4	0.2	0.9	0.5	0.3	0.1
Guatemala	0.3	0.1	0.0	0.0	0.3	0.1	0.0	0.0	0.2	0.1	0.0	0.0
Guyana	1.8	0.9	0.6	0.4	1.3	0.5	0.3	0.2	1.0	0.3	0.2	0.1
Honduras	0.7	0.4	0.2	0.1	0.6	0.3	0.2	0.1	0.5	0.3	0.2	0.1
India	0.6	0.3	0.2	0.1	0.5	0.3	0.1	0.0	0.5	0.3	0.1	0.0
Indonesia	0.3	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.0
Jamaica	2.5	2.1	1.8	1.5	2.2	1.8	1.5	1.3	2.0	1.6	1.4	1.2
Jordan	1.7	1.4	1.3	1.1	1.3	1.1	1.0	0.9	1.4	1.1	1.0	0.9
Kyrgyz Republic	0.3	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.1
Madagascar	0.9	0.6	0.4	0.3	0.7	0.4	0.3	0.2	0.6	0.3	0.2	0.1
Malawi	1.0	0.8	0.5	0.4	0.9	0.6	0.5	0.3	0.7	0.5	0.4	0.3
Malaysia	1.9	1.6	1.3	1.2	0.8	0.6	0.5	0.4	0.7	0.5	0.5	0.4
Maldives	8.3	6.7	5.4	4.5	7.1	5.6	4.5	3.6	7.0	5.5	4.4	3.6
Mali	0.7	0.6	0.4	0.4	0.6	0.4	0.3	0.3	0.6	0.4	0.4	0.3
Mauritius	0.7	0.6	0.5	0.4	0.3	0.2	0.1	0.1	0.1	0.1	0.0	0.0
Mexico	1.2	0.8	0.6	0.4	0.8	0.4	0.2	0.1	0.8	0.5	0.3	0.2
Morocco	2.7	2.3	2.0	1.8	2.3	2.0	1.7	1.5	2.4	2.0	1.8	1.6
Namibia	0.9	0.7	0.5	0.5	0.7	0.5	0.4	0.3	0.6	0.4	0.3	0.3
Nicaragua	0.5	0.2	0.1	0.0	0.3	0.1	0.0	0.0	0.2	0.1	0.0	0.0
Niger	0.6	0.5	0.4	0.3	0.6	0.4	0.3	0.3	0.5	0.4	0.3	0.3
Oman	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1
Pakistan	0.7	0.5	0.3	0.3	0.4	0.3	0.2	0.1	0.3	0.2	0.1	0.0
Papua New Guinea	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Paraguay	1.6	1.2	0.9	0.7	1.3	1.0	0.7	0.5	1.2	0.8	0.6	0.5
Peru	0.3	0.1	0.0	0.0	0.2	0.1	0.0	0.0	0.2	0.1	0.0	0.0
Philippines	0.2	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rwanda	1.0	0.7	0.6	0.4	0.9	0.6	0.5	0.3	0.8	0.6	0.4	0.3
Senegal	0.5	0.3	0.2	0.2	0.4	0.2	0.2	0.1	0.3	0.1	0.1	0.1
South Africa	2.4	1.9	1.5	1.2	1.5	1.1	0.8	0.6	1.0	0.7	0.5	0.4
Sri Lanka	0.7	0.5	0.3	0.2	0.5	0.3	0.1	0.1	0.3	0.2	0.1	0.0
St. Lucia	2.1	1.5	1.0	0.7	1.6	1.1	0.7	0.5	1.4	0.9	0.6	0.4
Swaziland	1.3	1.0	0.7	0.6	1.0	0.7	0.5	0.4	0.8	0.6	0.4	0.3
Thailand	1.0	0.7	0.6	0.5	0.5	0.3	0.2	0.1	0.3	0.2	0.1	0.1
Togo	0.7	0.4	0.3	0.2	0.6	0.3	0.2	0.1	0.5	0.3	0.2	0.1
Turkey	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Uganda	0.9	0.6	0.5	0.4	0.6	0.4	0.3	0.2	0.5	0.3	0.2	0.2
Uruguay	0.5	0.3	0.2	0.1	0.4	0.2	0.2	0.1	0.3	0.2	0.1	0.1
Venezuela	0.5	0.4	0.3	0.2	0.4	0.3	0.2	0.1	0.4	0.2	0.2	0.1
Zambia	1.0	0.7	0.4	0.2	0.8	0.5	0.3	0.1	0.6	0.4	0.2	0.1
Zimbabwe	3.7	3.0	2.5	2.1	2.9	2.3	1.8	1.5	2.8	2.2	1.8	1.6

Source: IMF staff estimates.

**Appendix Table 11. NAMA Products: Average Revenue Loss with Swiss Cut and Flexibilities**  
(In percent of original tariff revenue)

Swiss Cut	No Flexibility				5/5 Flexibility				10/10 Flexibility			
	10	15	20	25	10	15	20	25	10	15	20	25
Albania	54	45	39	34	44	35	29	25	45	38	33	29
Argentina	47	32	22	15	37	24	15	8	37	24	15	9
Bangladesh	54	40	30	22	48	35	26	19	42	30	22	16
Barbados	46	33	23	17	31	19	11	6	27	16	9	5
Bolivia	16	0	0	0	15	0	0	0	14	0	0	0
Botswana	50	38	30	25	37	27	20	16	31	22	17	14
Brazil	38	24	15	10	28	16	9	4	25	14	8	4
Chile	0	0	0	0	0	0	0	0	0	0	0	0
China	51	43	37	33	33	27	23	20	40	33	29	26
Colombia	38	26	18	13	26	16	10	6	25	15	9	5
Costa Rica	22	8	2	0	14	4	1	0	7	0	0	0
Croatia	44	35	29	25	33	26	22	18	35	28	23	20
Dominica	41	31	23	18	22	13	8	4	20	12	8	5
Dominican Republic	30	19	11	6	23	14	7	3	16	9	4	1
Ecuador	43	31	23	18	36	25	18	14	31	21	16	12
El Salvador	28	14	7	3	19	8	3	0	13	4	1	0
Gabon	61	52	46	41	54	45	39	35	58	49	43	39
Georgia	50	41	34	30	46	37	31	27	46	37	31	27
Grenada	33	20	12	7	26	15	8	4	21	11	6	3
Guatemala	22	9	2	0	17	6	1	0	12	4	0	0
Guyana	30	16	10	7	21	9	5	3	16	6	3	1
Honduras	34	20	11	6	28	16	9	4	23	13	7	4
India	38	21	11	5	33	17	8	2	30	16	7	2
Indonesia	35	24	18	14	18	9	5	2	14	8	6	5
Jamaica	61	50	42	36	53	43	36	31	48	39	33	28
Jordan	56	47	41	36	44	36	31	28	44	37	32	29
Kyrgyz Republic	22	17	14	12	15	11	8	7	15	11	9	8
Madagascar	43	28	19	13	36	22	15	10	28	16	10	7
Malawi	47	33	24	17	40	28	20	14	33	23	16	12
Malaysia	59	49	42	37	26	20	16	13	22	17	15	13
Maldives	60	48	39	32	51	40	32	26	51	40	32	26
Mali	45	34	27	23	38	27	21	17	35	27	22	19
Mauritius	59	47	38	32	23	16	12	8	8	4	3	2
Mexico	45	30	21	17	29	16	9	5	30	17	11	7
Morocco	64	54	48	43	55	46	40	36	55	46	41	37
Namibia	51	38	30	25	38	27	21	16	31	22	17	14
Nicaragua	24	11	4	0	18	7	2	0	12	4	1	0
Niger	49	38	31	25	43	33	26	20	40	32	26	21
Oman	26	21	19	17	18	14	11	10	21	17	15	14
Pakistan	41	30	22	16	25	16	10	5	20	12	7	3
Papua New Guinea	57	44	34	27	4	2	1	1	6	4	3	3
Paraguay	45	33	25	19	38	27	20	15	33	24	18	13
Peru	27	13	3	2	22	9	0	0	20	8	0	0
Philippines	19	10	6	4	5	1	0	0	2	1	1	1
Rwanda	59	44	33	25	52	38	27	20	48	36	27	21
Senegal	34	22	17	13	26	15	12	9	19	9	7	5
South Africa	52	41	32	26	32	24	18	14	21	15	11	9
Sri Lanka	41	27	17	11	27	16	8	4	19	11	5	2
St. Lucia	50	36	25	18	39	27	18	11	33	22	14	9
Swaziland	50	37	29	23	38	27	20	15	33	24	18	14
Thailand	41	29	23	19	20	11	8	6	14	7	6	5
Togo	32	19	12	7	27	15	10	5	22	12	7	4
Turkey	21	14	11	8	3	1	0	0	4	3	2	2
Uganda	49	35	27	21	35	23	16	12	29	18	13	9
Uruguay	38	25	16	11	30	18	11	7	24	13	7	4
Venezuela	44	31	23	17	34	23	16	11	31	20	14	9
Zambia	42	28	16	9	34	21	11	6	26	15	7	2
Zimbabwe	57	46	39	33	46	35	28	23	43	34	29	24

Source: IMF staff estimates.