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ABSTRACT

Trade Preferences to Small Developing Countries and the Welfare Costs of Lost Multilateral Liberalization*

The proliferation of preferential trade liberalization over the last 20 years has raised the question of whether it slows down multilateral trade liberalization. Recent theoretical and empirical evidence indicates this is the case even for unilateral preferences that developed countries provide to small and poor countries but there is no estimate of the resulting welfare costs. To avoid this stumbling block effect we suggest replacing unilateral preferences by a fixed import subsidy. We argue that this scheme would reduce the drag of preferences on multilateral liberalization and generate a Pareto improvement. More importantly, we provide the first estimates of the welfare cost of preferential liberalization as a stumbling block to multilateral liberalization. By combining recent estimates of the stumbling block effect of preferences with data for 170 countries and over 5,000 products we calculate the welfare effects of the United States, European Union and Japan switching from unilateral preferences to Least Developed Countries to the import subsidy scheme. Even in a model with no dynamic gains to trade we find that the switch produces an annual net welfare gain for the 170 countries ($4,354 million) and for each group: the United States, European Union and Japan ($2,934 million), Least Developed Countries ($520 million) and the rest of the world ($900 million).

JEL Classification: D78, F13, F14 and F15
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1 Introduction

One of the main pillars of the multilateral trading system is supposedly non-discrimination across trading partners: the most-favored-nation (MFN) principle embodied in the first article of the General Agreement on Tariffs and Trade (GATT). However, currently nearly all WTO members are members of preferential trade agreements (PTAs) and trade within PTAs accounts for a third of world trade. The potential for PTAs being a stumbling block to multilateral trade liberalization (MTL) was an important concern during the Uruguay Round.[1] The focus of this paper is with the more recent concern within the Doha Round that even unilateral trade preferences provided to small and poor developing countries can slow down MTL by the large developed countries that provide them.[2] This is considered to be a sufficiently important problem that the IMF recently approved the creation of a special lending program aimed at developing countries "to mitigate concerns (...) that their balance of payments positions could suffer, albeit temporarily, as multilateral liberalization changes their competitive position in world markets. Chief among these concerns is that broad-based tariff liberalization might erode the value of their preferential access to important export markets."[3] According to the WTO's director general the IMF's program is "a welcome contribution to the Doha Round, in particular to attaining ambitious market access results".[4]

Several factors explain the prominence of this issue in the Doha round. First, until recently many preferences were given as a share of MFN tariffs and in some cases the preferential tariff was positive. This meant that after a MFN tariff reduction there was still room to maintain a given preference margin by lowering the preferential tariff. Currently, several preferential programs for developing countries feature duty and quota-free access and therefore any reductions in MFN tariffs by the preference giving countries lower the preference margin. Second, until recently even the most generous unilateral preference programs had numerous exceptions and constraints. Therefore preference erosion could previously be addressed, and in fact it often was, by increasing the coverage or reducing the stringency

[1] According to Bhagwati (1991) a PTA is a building block if it accelerates MTL and a stumbling block if it slows it down.

[2] According to a recent article of the Economist a key reason for the Doha Round to collapse is that "poor countries with preferential access to rich world markets want to make sure that freer trade will not reduce these preferences." "Talking the talk", July 17th 2004, p. 14.

[3] IMF Press Release No. 04/73, April 13, 2004. See IMF 2004 for details.

[4] April 24th 2004 speech at the International Monetary and Financial Committee. For an interesting discussion, see Winters (2004). The conjecture that preference erosion would reduce MTL is not new: it was an argument used against the Generalized System of Preferences provided to developing countries when it was originally proposed. (Johnson [1967] p. 166)

of certain requirements.[5]

A somewhat puzzling question is that if the major losses from erosion are concentrated among a few small countries and products (Subramanian [2004]) then how can they significantly affect the outcome of the Doha Round?[6] One explanation is that the current round was designated a "development round", which created an expectation that it would benefit developing countries. A common complaint from developing countries is that most GATT rules were decided by developed countries (Srinivasan [1999]). However, as Mattoo and Subramanian (2004) argue, under the WTO developing countries have gained de jure and de facto power relative to the GATT days, which implies that a few small countries can have an impact in the outcome of the round. This impact is magnified when the small set of countries that stand to lose considerably from preference erosion are joined by others that perceive such losses to be important to them as well. This points to the importance of further research and dissemination of basic facts about gains from preferences.[7]

An additional reason, which we will focus on, why preferences to small countries can affect the MTL is that the developed countries providing them may themselves want to maintain them, as they can be used as a side payment for cooperation on other issues. Here are two brief examples. First, in 2000 the European Commission argued that a cut in the price support of about 25% in E.U. sugar was not tenable because it would cause an income loss of 250 million euros to a group of developing countries that export sugar to the E.U. under preferential treatment.[8] Second, the U.S. recognizes that its MFN tariff reductions hinder its ability to extract concessions in terms of enforcing labor, environmental standards, etc, from the countries that export under a preference to the U.S.[9]

[5] This is what happened after the Uruguay Round with unilateral preferences such as the E.U.'s Everything but Arms and the U.S.'s African Growth Opportunity Act extending preferences to agriculture and textiles and eliminating quantity restrictions. Moreover, these are sectors where the developed countries maintain high MFN protection so duty-free access generates a large preference margin and potentially large gains to developing countries in products that they actually have a comparative advantage in.

[6] Alexandraki and Lankes (2004) find that for middle-income countries these products include bananas, sugar and textiles

[7] There is some debate regarding the effectiveness of preferences in generating additional exports. Haveman and Shatz (2003) provide evidence, that the unilateral preferences of the Triad countries considerably increased their imports from LDCs in 2000. Sapir (1981) and Sapir and Ludenberg (1984) provide earlier estimates of the GSP scheme of the E.U. and U.S. respectively. Brown (1989) provides a CGE analysis of Japan's GSP. UNCTAD (2003) and Hoekman, Michalopoulos and Winters (2004) and Stevens and Kennan (2004) propose several recommendations to realize the potential net benefits of preferences for LDCs including ways to improve utilization rates, relax and harmonize rules of origin, increase the predictability of preferences through binding them in the WTO, etc. Many of these recommendations will also apply to our proposed alternative of import subsidies.

[8] European Commission (2000), "Commission proposes overhaul of sugar market." Brussels, 10/4/2000. IP/00/1109.

[9] According to the International Trade director of the General Accounting Office in the U.S.: "Because GSP benefits are limited, and would decline if the GATT Uruguay Round agreement is enacted, the program provides only a modest degree of leverage to encourage beneficiary country governments to change their country practices [for enforcing intellectual

The fear that PTAs could be a stumbling block to MTL has generated a considerable theoretical literature.[10] Given the second-best nature of PTAs it is not surprising that some models predict such an outcome and others contradict it. However, most of these models have a common driving mechanism: PTAs affect MTL via the effect that preferential tariffs have on trade volumes and prices within the PTA. Therefore, since the unilateral preferences that the U.S. and the E.U. extend to small countries have little impact on prices and quantities in the U.S. and the E.U., most of the existing models fail to predict that such preferences could affect the U.S. or the E.U.'s MFN tariffs.

Contrary to previous work Limão (2002) provides a model where preferences that are extended to small countries can cause large countries to maintain higher MFN tariffs. The stumbling block effect arises due to an important feature of current agreements by the U.S. and the E.U. Increasingly they offer lower trade barriers in exchange for cooperation by small developing countries in non-trade issues such as labor and environmental standards, intellectual property protection, drug enforcement, emigration, human rights, etc.[11] Thus the preferential margins extended to small countries are a payment for cooperation and so a reduction in MFN tariffs that reduces the preferential margin will be resisted both by the country that receives the preference and by the one offering it.[12]

The following example illustrates the intuition behind the problem and its solution. The U.S. MFN tariff on flowers is 10% but Colombia can export them at a preferential tariff equal to zero, so it enjoys a preferential margin of 10% in the U.S. Suppose that, in the absence of any preferences, the U.S. would choose to reduce that MFN tariff to zero in the Doha round. If it did so then the preferential tariff margin it could offer to Colombia would be zero. The model then predicts that, if the U.S. must provide a preference to Colombia to extract cooperation on a non-trade issue, it would not reduce the MFN tariff all the way to zero. The conceptual solution to this problem is simple: allow for a preferential import subsidy that maintains the preference margin unchanged relative to the initial 10% MFN tariff. If the U.S. charges the MFN tariff on Colombian flowers but pays a fixed subsidy rate of 10% to the Colombian producers all participants are initially indifferent. However, the U.S. could now maintain the fixed subsidy rate and reduce its MFN tariff without the opposition that arises from

property rights and labor standards] (...) It should be noted that tariff reductions negotiated in GATT, if implemented, will reduce the value of the GSP's tariff preference by 40 % and, therefore, the incentive for beneficiary countries to participate in the GSP program." Testimony before the Subcommittee on International Trade. In "International Trade: Issues Concerning the Generalized System of Preferences", GAO/T-GGD-94-174, June 20th , 1994.

[10] See Bagwell and Staiger (1998), Levy (1997), Krishna (1998). Winters (2001) provides an excellent review.

[11] In the appendix we provide references to other side conditions.

[12] International trade lawyers have also warned of the possibility that GSP will retard the MTL of the developed countries that grant such preferences because of a similar mechanism. (Trebilcock and Howse [1999], p.462-463).

preference erosion and the U.S. desire to extract cooperation through such preferences.

Although preferences to small and poor countries may not cause the current round to completely fail they are quite likely to cause less MTL. To assess the welfare costs of preferences in terms of lost MTL we require an estimate of the stumbling block effect generated by PTAs. Until recently, there was little systematic evidence on the effect of PTAs on MTL. Limão (2005) and Karacaovali and Limão (2005) provide such estimates for the U.S. and the E.U. during the Uruguay Round for various of their PTAs, including their unilateral preferences to developing countries. We combine these estimates with data for 170 countries and approximately 5,000 goods to provide the first welfare estimates of PTAs as a stumbling block. To do so we calculate the welfare effects from the average expected MFN reductions in the Doha round relative to the subsidy counterfactual, which entails additional reductions by the TRIAD countries: the US, EU and Japan.

Our criteria in choosing the counterfactual to analyze the cost of preferences as a stumbling block were the following. It should remove the stumbling block effect, generate a Pareto improvement in the context of a well defined model, so we can expect it to be supported by WTO members, and be simple enough to permit estimation and implementation. When the import subsidy is designed to mimic the preferences it fulfills these criteria, as we will show. Eliminating unilateral preferences or replacing them with direct transfers to reward cooperation would remove the stumbling block. However, simply eliminating preferences would not be supported by several countries so it is not an interesting counterfactual. Using cash transfers may also not be the most efficient way to transfer resources to other countries, as the aid vs. trade literature highlights, or reward cooperation.[13] Political economy constraints that reduce the effectiveness of cash transfers relative to preferences are present in practice, otherwise we would not observe several of the current preference schemes.[14] Therefore, as an alternative to preferences, the subsidy scheme may also dominate direct transfers and therefore it is an appropriate counterfactual to estimate the opportunity cost of preferences.

[13] Thus our proposal differs considerably from others that suggest temporary development assistance to the governments of developing countries that are hurt by preference erosion, e.g. Hoekman (2004). See McCulloch and Pinera (1977) on the issue of trade and aid issue and Adam and O'Connell (2004) for a more recent analysis. Azam and Laffont (2003) analyze the difficulty of writing effective contracts for aid due to informational and political problems.

[14] For example, if some individuals in the preference granting country do not value the cooperation then they will oppose a direct transfer to obtain it. This is more difficult with the indirect transfer that arises with the preference because trade policy is not revised every year whereas budgets are. Moreover, the indirect transfer through a preferential tariff may be somewhat more "disguised" than the direct transfer. In the receiving country, cash from a direct transfer may end up in a politician's pocket and thus not provide the incentives for the intended supply of cooperation. For example, one of the stated aims of the U.S. in providing preferences to the Andean countries is to raise the relative price to activities other than drug production.

We focus on a subset of PTAs that fit the assumptions of the theory: the preferences that the TRIAD extends to LDCs. We estimate annual welfare gains for the 48 LDCs of $520 million, we also calculate these gains by country and find that all except one gain. The maximum gain is 6.7% of GDP per year and the average is 0.38%. Importantly, the countries that most oppose MTL because of its preference erosion effect are the ones we estimate gain the most from the switch. Welfare for the TRIAD would increase by $2934 million per year, due mainly to the additional MFN tariff reductions that would be allowed by the subsidy. For the same reason, the rest of the world experiences an annual welfare gain of $900 million, this is important since an important concern with PTAs is that they do not internalize any costs on outsiders.[15] In relative terms the LDCs as a group gain the most, over 0.5 % of GDP per year, which is over 50 times the figure for the TRIAD.

The aggregate annual welfare effect of $4354 million is likely to be a lower bound of the stumbling block effect of PTAs for several reasons. First, it applies only to the unilateral preferences extended to a subset of countries and therefore to a subset of goods that are subject to a stumbling block effect. Second, the stumbling block estimates in Limão (2005) are larger when they apply to all PTA partners so there would be a bigger potential for MTL if the switch applied to all of the TRIAD's PTAs. Third, since we want to estimate the effects at the disaggregated tariff line level, we use a model where there are no dynamic gains from trade, which is known to typically generate modest gains from liberalization. Finally, we may be overestimating the amount of liberalization that is possible under the preference scheme since there is the *possibility* that the concern with preference erosion will prevent the completion of the round. If so we estimate that the preferences would cost an additional $47 billion in terms of lost multilateral liberalization.

The structure of the paper is the following. In section 2 we provide a theoretical framework that explains how preferential treatment to small countries can generate a stumbling block, and discuss the recent evidence that supports it. In section 3 we calculate the welfare effects for 170 countries of preferences as a stumbling block, relative to a counterfactual with an import subsidy, in the context of the unilateral preferences provided by the U.S., E.U. and Japan to various sub groups of least developed countries. Although an import subsidy is conceptually simple it is not commonly utilized so in section 4 we address issues related to its implementation. In the final section we discuss the results and contrast our proposal with others. In the appendix we provide a brief description of the main

[15] Chang and Winters (2002) provide evidence that Mercosur affected non-members but focus on the direct effect it had in depressing non-members' export prices into Mercosur rather than calculating welfare effects.

types of preferential programs, with particular focus on unilateral preferences.

2 Preferences as a stumbling block to MTL: theory and evidence

2.1 Theory

PTAs can affect MFN tariffs through various channels. They can divert scarce negotiation resources and alter the number of negotiating parties and their bargaining power. In the context of unilateral preferences that we analyze these effects are not as relevant as the one in the model that we now provide an overview of. This simple model shows two things. First, the unilateral trade preferences that large countries use can cause them to maintain higher multilateral tariffs even if the preferences are extended to small countries. Second, an import subsidy resolves this problem.[16]

Each regional bloc contains a large and a small country, which we denote by L and S. There exist two externalities within each bloc. First, L is affected by the level of an action e, that S can undertake at a cost. This is a general way to capture the demand that L has for cooperation in labor, environmental, emigration issues, improvements in governance, etc. Second, there is a terms-of-trade externality, that is L can use a tariff to depress the price of S's exports. The countries in a bloc can internalize these effects via a PTA where L lowers its tariffs on S's exports in exchange for an increase in the latter's provision of e. The PTA is modeled such that its only direct trade effect is to increase the price that S receives for its exports.[17]

There are two import tariffs that L chooses: t, the multilateral tariff that it applies to the rest of the world, and $t^p \leq t$, the preferential tariff on that good applied to imports from S. The good that L exports to the rest of the world faces a tariff t^r. So, the objective function that L maximizes is:

$$W^L = W^L(e, t^p, t, t^r) \tag{1}$$

where the partial effects are $W_e^L > 0$ and, due to terms-of-trade effects, $W_x^L > 0$ for $x = t^p, t$ when evaluated at $x = 0$ and $W_{t^r}^L < 0$.

The objective maximized by S depends on e and the tariffs set by L, which affect the price that S

[16] This is a simplified version of the model in Limão (2002).

[17] In doing so the model abstracts from issues of trade diversion and creation to focus on an alternative channel for the impact of PTAs on multilateral tariffs that is particularly relevant for the preferences offered to small developing countries.

receives for its exports.[18]

$$W^S = W^S(e, t^p, t) \tag{2}$$

Under a PTA S receives an export price of $p^w(t) + t - t^p$, where $p^w(t)$ is the equilibrium world price, so $p^w(t) + t$ is the price in L. Therefore, $W^S_{t^p} < 0$ and $W^S_t > 0$. But, in the absence of a PTA, S faces the multilateral tariff and receives only $p^w(t)$, which falls when t is raised and so $W^S_t < 0$. For simplicity we assume that S has no trade in the good exported by L to the rest of the world and thus is indifferent about the level of t^r.[19]

The crucial assumption that generates a motive for L's preferential treatment for S is that it values e sufficiently relative to S.[20] We take the neutral case where S places neither a positive nor a negative weight on the *direct* effect of e on itself and simply assume that this action requires some expenditure on the part of S, which implies a negative marginal benefit in terms of the numeraire. So, if S and L do not cooperate, S does not supply e and L does not provide a preference. They can improve on this outcome through a bargain where L sets $t^p < t$ and S supplies e. Note that, for given t, this bargain may be just as efficient as a lump-sum transfer from L given that we assume preferences are quasilinear so that the tariff revenue that L is giving up through the preference has the same effect as an equivalent lump-sum transfer. As we pointed out in the introduction, there can be realistic political economy constraints that would deliver the preference as the constrained first-best policy to be used in exchange for e, here we simply assume that the preference is the only available instrument and analyze the implications for the multilateral tariff.

In most of the agreements that we analyze in the data L has nearly all the bargaining power relative to S. Therefore it is sensible to focus on the outcome of a take-it-or-leave-it offer that leaves S at the status quo welfare level. If S is a WTO member then the maximum tariff that L can set is $t^p = t$, due to the MFN rule. Therefore the status quo welfare will be determined by evaluating t^p at t and e at the level that is optimal for S.[21] So, for a given level of t and t^p, we can write the equilibrium level of e^b as a function $e^b(t^p, t)$. This function is decreasing in the preferential tariff and increasing in the MFN tariff because either movement raises $W^S$and thus allows L to extract a higher level of e. In the

[18] We could add trade policy for S but as long as it occurs in separate products and there is separability it would not affect results.

[19] The balance of payments condition is satisfied through a numeraire good that enters utilities in a quasi-linear way and that L uses to pay for its imports from S.

[20] This may either be due to a difference in preferences, an income effect, or simply a scale effect if e is a public good (or bad) and there are more individuals in L.

[21] More specifically, the bargain that L offers must at least satisfy $W^S(e = e^b, t^p = \tau^b < t, t) \geq W^S(e = 0, t^p = t, t)$.

simple case we focus on the net exports of S are constant and it can be shown that this implies that, in the function $e^b(t^p, t)$, S cares only about the preferential margin $t - t^p$ so $e^b_t = -e^b_{t^p} > 0$.[22]

In the GATT/WTO countries negotiate reciprocal tariff reductions with their principal suppliers. So, if the rest of the world (ROW) is the main supplier of the good that L also imports from S then L negotiates with the ROW. To capture this we model the equilibrium multilateral tariffs as the solution that maximizes the joint objective of L and the ROW.[23] Moreover, here we assume that L chooses the preferential tariff simultaneously and further simplify by assuming that the ROW is a mirror image of L, although neither of these assumptions are essential for the result. This implies that we can focus on solving for t since it will be equal to t^r and that the effect of t on W^r is identical to that of t^r on W^L. Imposing the equilibrium conditions of symmetry, $t = t^r$, and $e = e^b(t^p, t)$ the *joint* optimum for L and the ROW under a PTA is given by the following program and necessary first-order conditions

$$\{\tilde{t}, \tilde{t}^p\} \equiv \arg_{t,t^p} \max W^L(e = e^b(t^p, t), t^p, t, t^r = t) \tag{3}$$

$$W^L_{t^p} + W^L_e e^b_{t^p} \leq 0 \tag{4}$$

$$W^L_t + W^L_{t^r} + W^L_e e^b_t \leq 0 \tag{5}$$

To see how a stumbling block can arise when import subsidies are not allowed let's contrast this with the condition for the tariff in the absence of a PTA. Now L has no incentive to provide a preference to S so $t = t^p$and $e = 0$, which yields the following solution:

$$t' \equiv \arg_t \max W^L(e = 0, t^p = t, t, t^r = t) \tag{6}$$

Using the FOC derived for this last problem, $W^L_t + W^L_{t^r} + W^L_{t^p} = 0$, to evaluate the FOC for t when a

[22] In the estimation we do not impose this condition.

[23] We follow Bagwell Staiger (1999). in assuming that the main motive for the reciprocal trade liberalization agreement between L and ROW is to internalize a terms-of-trade externality between them. Here, we abstract from enforcement issues by assuming that L and ROW are sufficiently patient that they can sustain the most cooperative solution through repeated interaction. Limão (2002) analyzes the effects of binding incentive constraints.

PTA is present, (5), we can determine if $\tilde{t} > t'$. That will be so if the following expression is positive:

$$\begin{aligned} [W_t^L + W_{t^r}^L + W_e^L e_t^b]_{t',t^p=0} &\geq [W_t^L + W_{t^r}^L + W_{t^p}^L(-\frac{e_t^b}{e_{t^p}^b})]_{t',t^p=0} \\ &= [(W_t^L + W_{t^r}^L)(1-(-\frac{e_t^b}{e_{t^p}^b}))]_{t',t^p=0} = 0 \end{aligned} \tag{7}$$

where the inequality in the first line reflects the use of (4). If import subsidies were allowed then t^p could continue to be lowered below zero and the inequality above would disappear since an interior solution could be found. But otherwise it is possible to obtain a corner solution in the PTA, that is a situation where, at $t^p = 0$, L would like S to increase e. In this case, (4) holds with a strict inequality. The second line of (7) is zero in the case we consider where $-e_{t^p}^b = e_t^b$, i.e. when an increase in the MFN tariff has the same effect as a decrease in the preferential tariff, both simply increase the preferential margin. This implies that $\hat{t} > t'$ if and only if $[W_{t^p}^L + W_e^L e_{t^p}^b]_{t^p=0} < 0$. So, import subsidies completely eliminate the need to distort the MFN tariff to maintain a preference margin.

2.2 Evidence

Before estimating the costs of the stumbling block effect that arises in the theoretical model we provide some direct evidence for it, which we subsequently use in our quantification. The theoretical model generates specific testable predictions. At an extreme if the MFN tariff is zero no tariff preference can be offered and so no preferential agreement is possible in the absence of subsidies. Therefore, to the extent that the U.S. and E.U. value the cooperation with the side conditions in those agreements, reductions in MFN tariffs on products imported from the preferential partner are more costly than reductions in similar products.

Limão (2005) estimates the direct effect of the U.S.'s PTAs on its MFN tariffs by exploring the fact that this effect will be weaker for goods it imports only from non-PTA countries. Using tariff data for over 5000 products he finds that the U.S.'s PTAs generated a stumbling block effect in the Uruguay Round. After controlling for several determinants of U.S. tariff changes during the Uruguay Round he estimates that the U.S.'s average cut for goods exported by any of its PTAs was about half that of other goods. The effect is stronger for products that are exported under all PTAs or constitute relatively larger shares of a given PTA's exports to the U.S. The average cut for GSP goods on their own was on average only 74% relative to non-PTA goods. Interestingly the estimates also allow a calculation of the direct effect on the U.S. MFN tariffs for all its goods: it would have been about 1 percentage point

lower on average in the absence of its PTAs. For the case of GSP only that figure is about 0.3. [24]

Karacaovali and Limão (2005) provide structural estimates of the stumbling block effect for the E.U. They find effects that are qualitatively and quantitatively similar to the ones for the U.S. More specifically, after controlling for several determinants of the E.U.'s MFN tariff changes in the UR they find that the E.U.' average cut for goods exported by any of its PTAs was about half that of other goods. The model predicts that if the preferential tariff is positive then the MFN tariff can still be reduced without affecting the preference margin, by simply lowering the preferential tariff by the same amount. Karacaovali and Limão (2005) find evidence of this: there is no stumbling block effect when the preferential tariff can still be lowered. This strongly supports our argument that an import subsidy, by removing the non-negativity constraint for tariffs, would indeed eliminate the stumbling block effect.

3 Welfare estimates of preferences as a stumbling block to MTL

As we argue in the introduction we believe the import subsidy provides a good counterfactual to estimate the opportunity cost of preferences. In this section we describe the methodology, data and estimates of this cost for the world and specific countries. Our focus is on the unilateral preferences that the TRIAD extends to 49 LDCs.

3.1 Methodology

We present the methodology used to quantify the subsidy that each granting country (SGC) would need to pay a subsidy receiving country (SRC). This provides both an input into the final welfare calculation but also a measure that may preempt any practical concern of budgetary costs of implementation.[25] We then describe the framework to calculate the welfare effects due to the additional MTL that the subsidy permits and the final welfare effects from switching to the subsidy scheme. This gain from switching provides the opportunity cost of the preferences.

[24] The results on multilateral tariff reductions can also be used to derive the effect on U.S. and world prices. The price effects for goods exported under any of the U.S.'s PTAs were on average only 52% of those in similar non-PTA goods (74% for GSP). If the good was exported by every PTA then the effect was even smaller, 23%.

[25] An important motive to compute this cost for the United States is that the "pay-as-you-go" rules for revenue and direct spending of the Budget Enforcement Act of 1990 require that any revenue or spending legislation be offset.

3.1.1 Budgetary cost to the SGC

We choose the initial import subsidy rate for each good to be equal to the current preference margin for two reasons. First, it provides us with a convenient benchmark to calculate welfare changes because the initial switch from a preference to a subsidy at a similar rate leaves all prices and quantities unchanged. Second, governments considering this proposal should find it re-assuring that initially it does not affect the status quo. Naturally, alternative initial subsidies are possible and would deliver different results. Therefore the import subsidy paid by a given SGC on good i at the current tariffs and world prices is defined as follows:

$$S_i = s_i p_i^w m_i \tag{8}$$

where s_i is the advalorem subsidy rate that we choose to equal the difference between the *current* MFN and preferential tariff, $t_i - t_i^p$, i.e. the current preferential margin, as in the theoretical model. The world price is p^w and m represents the quantity exported by a SRC to a SGC at the current p^w and tariffs. This subsidy value can be easily calculated using current data on MFN tariffs, preferences and exports if we assume full utilization of preferences. This is also the figure often used to provide an approximation of the yearly potential gains to beneficiaries of the preference schemes in terms of export revenues.[26]

The budgetary cost of the switch for the granting country is zero in the absence of MFN tariff reductions since S_i in (8) is equal to the tariff revenue it currently foregoes due to the preference. However, reductions in the MFN tariff cause changes in p^w and m that consequently change the subsidy level. To calculate the resulting prices and quantities we use the worldwide partial equilibrium model of traded goods described in the appendix, where we assume that all WTO members would cut their tariffs by 33% in the current round of negotiations.[27] Using an "$*$" to denote the values after the MFN tariff reductions we have $S_i^* = s_i p^{w*} m^*$. We recall that the subsidy rate is unchanged by construction but the tariff revenue is now collected at the lower tariff, t^*. Thus, for a good i imported preferentially the budgetary cost of moving from the preference to the subsidy scheme when the MFN

[26] Currently these preferences are not fully utilized (Inama [2003]) so it is likely that would also be the case under the subsidy. Therefore our estimates of the cost of the subsidy and preference erosion are likely to be an upper bound for the true effects. However, since our main interest is in comparing the outcome under the preference relative to the subsidy we don't believe that deviations from full utilization rate will be quantitatively important since they generate similar effects under the two scenarios.

[27] It is difficult to determine what the likely average cut of the Doha Round will be, but an average cut of 33 percent was agreed for developed countries in the Uruguay Round.

tariff is reduced to t_i^* is:

$$B_i = \left((t_i - t_i^p) - t^*\right) p_i^{w*} m_i^* + t_i^p p_i^{w*} m_i^{p*} \tag{9}$$

The term in the first parenthesis represents the subsidy cost minus the tariff revenue collected on imports from the SRC. The second term represents tariff revenue that would have been collected if the preference scheme had been in place, where m^{p*}denotes import quantities from LDCs under the preference scheme after the MFN tariff reduction.[28]

There is an additional budgetary implication associated with the introduction of the subsidy scheme. The theoretical model predicts that the move will allow an additional MFN tariff reduction, which will change world prices and thus affect tariff revenue and the subsidy. Using estimates from Limão (2005) we estimate this additional liberalization to be 25% of the 33% benchmark (or an additional 8.3%). With this additional liberalization the budgetary cost of switching to the subsidy relative is:

$$B_i' = \left((t_i - t_i^p) - t'\right) p_i^{w\prime} m_i' + t_i^p p_i^{w*} m_i^{p*} + \left(t_i^* p_i^{w*} m_i^{r*} - t_i' p_i^{w\prime} m_i^{r\prime}\right) \tag{10}$$

where the prime notation denotes the value of the variables evaluated at the equilibrium under the subsidy with a larger MFN liberalization than under the preference scheme, and the superscript r is for imports from ROW. The last term is the change in tariff revenue, which can be positive or negative depending on the import demand elasticities.

3.1.2 Welfare Effects for the SGC

Ultimately we are interested in the full welfare effects that arise from switching to the subsidy scheme, i.e. the relative cost of maintaining the preferential scheme in terms of lost multilateral liberalization. Denoting the welfare level for the SGC, L, by W^{Lp} under the preference and W^{Ls} under the subsidy *if* it reduced the MFN tariffs by the same amount, the difference between the two is simply the amount of the budgetary effect in (9):[29]

$$W^{Ls} - W^{Lp} = \sum_i B_i \tag{11}$$

[28] Note that equation (9) assumes –as we do later in the partial equilibrium model used to estimate the impact of tariff reduction on world prices—that these LDCs are too small to influence world prices when preferences are granted (or replaced by the subsidy scheme). Panagariya et al (2001) provide detailed econometric evidence that this is a reasonable assumption for products that Bangladesh exports to the US under the Multi-Fibre Arrangement.

[29] Assuming that the effect of small changes in the export supply of SRC on the world price are negligible.

The additional MTL permitted by the subsidy causes an extra welfare effect, which we denote by ΔW_i^{Ls}. So the total welfare effect of the switch for each SGC, which we report in Table 2, is the sum of these two effects over all the products:

$$W^{Ls\prime} - W^{Lp} = \sum\nolimits_i \Delta W_i^{Ls} + W^{Ls} - W^{Lp} \tag{12}$$

To determine $\sum_i \Delta W_i^{Ls}$ we start with the income-expenditure identity in each SGC after the subsidy is implemented and the MFN tariff reduced to t_i^*:

$$e(1, \mathbf{p}, u) = r(1, \mathbf{p}, v) + \sum\nolimits_i (t_i^* p_i^{w*} M_i^* - S_i^*) \tag{13}$$

where e is the minimum expenditure necessary to achieve u at the domestic prices, $\mathbf{p}$, 1 is the price of the numeraire and r is the maximum revenue given the (fixed) endowments, v, at the domestic prices $\mathbf{p}$. The total level of imports of i is $M_i^* = m_i^* + m_i^{r*}$. Totally differentiating (13), using Shephard and Hotelling's lemma and rearranging provides a first order approximation to $\sum_i \Delta W_i^{Ls}$:

$$\sum\nolimits_i \Delta W_i^{Ls} \approx e_u du = \sum\nolimits_i [(M_i^* - x_i^*) dp_i + (dt_i p_i^{w*} M_i^* + t_i^* dp_i^w M_i^* + t_i^* p_i^{w*} dM_i) - \left(S_i' - S_i^*\right)] \tag{14}$$

where e_u is the inverse of the marginal utility of income; and x_i^* are export quantities when the world price is p_i^{w*}. The term in the first parenthesis represents changes in surplus due to price changes, the second captures tariff revenue effects and the last one the change in the subsidy expenditure. Using the definition of import demand elasticity, the change in imports, dM_i, is given by:

$$dM_i = \epsilon_{m_i} \hat{p}_i M_i^* \tag{15}$$

where ϵ_{m_i} is the elasticity of import demand. In the data section we discuss the estimates of the elasticities we use. The term.$\hat{p}_i$ represents the percentage change in domestic prices, $\hat{p}_i = \hat{p}_i^w + dt_i/(1 + t_i^*)$. To calculate the change in world prices due to the extra MFN reduction by *all* TRIAD members we use the partial equilibrium model described below and in more detail in the appendix.

3.1.3 Welfare Effects for the SRC

For SRCs the welfare effects are also given by (14) with two basic differences. First, we assume that the SRCs are not lowering their tariffs by more than 33% and since it is this extra liberalization that

is reflected in (14), the welfare effects for SRCs do not include terms that involve own liberalization. Second, the SRCs are not paying subsidies and so the two last terms in (14) are also absent. So for the SRC denoted by S we have:

$$\sum_i \Delta W_i^{Ss} \approx e_u du = \sum_i [(M_i^* - x_i^*)dp_i + t_i^* dp_i^w M_i^* + t_i^* p_i^{w*} dM_i] \tag{16}$$

The variables in (16) correspond to the SRCs and its values are different from those in (14) although we use similar notation. We also note that for the SRCs the consumer and producer price may diverge because of the subsidy the exporters receive, so the change in price for a producer that exports a good to a SGC is $dp_i = [1 + s_i]dp_i^w$, whereas for the consumer it is $[1 + t_i]dp_i^w$, where t_i here refers to the SRCs' tariff.[30] Moreover, we note that the welfare of the SRCs is affected both on the export and import side because all world prices are changing. Thus the SRCs can see their welfare increase or decrease and one cannot clearly sign this *a priori*.

To obtain the total welfare change in the SRCs, we need to add the change in welfare that is associated with the switch from the preference to the subsidy scheme if both had the same 33% MFN tariff reduction. The only difference between the preference and subsidy equilibrium after the 33% MFN reduction is that the price received by exporters under the subsidy is $(1 + t_i - t_i^p)p_i^{w*}$, which is higher than the price under the preference scheme, $(1 + t_i^* - t_i^p)p_i^{w*}$, due to the preference erosion effect.[31] This leads to a higher producer surplus under the subsidy scheme, which we approximate as follows: $\Delta PS_i \approx (t_i - t_i^*)p_i^{w*}m_i^{p*} + 0.5(t_i - t_i^*)p_i^{w*}(m_i^* - m_i^{p*})$. This extra effect of the subsidy scheme is added to (16) to calculate the final welfare effect for SRCs that is reported in tables 2 and A.2.

We also calculate the preference erosion for each SRC in each SGC market if current preferences were maintained:

$$\Theta = \sum_i [(t_i - t_i^p)p_i^w m_i - (t_i^* - t_i^p)p_i^{w*}m_i^{p*}] \tag{17}$$

which is simply the difference between the preferential tariff rent before and after a 33% reduction in MFN tariffs, taking into account the supply response. This is reported in the last column of table 1.

[30] Therefore in our estimates we calculate separately the effects that arise through the imports and exports in the case of goods that are subject to preferences.

[31] The reason for no other effects is that world prices are identical under the preference and subsidy scheme after the 33% MFN reduction and we assume no substitution or income effects in demand. Thus consumption and imports for the SRCs are identical under the two scenarios.

3.1.4 Price and quantity effects

The model used to estimate changes in world prices, imports and welfare is a simple partial equilibrium model for each of the six-digit tariff lines existing in the Harmonized System (HS) classification. We assume that each tariff line includes a homogenous good and that the world market for each of them is in equilibrium. There are no substitution or income effects on the demand or supply side. Using estimates of import demand and export supply elasticities, we can then solve for the percentage change in world prices associated with a tariff reduction in any (or all) 170 countries in the sample. These changes in world prices are then plugged into individual countries import demand and export supply functions to obtain quantities, using (15), and import revenue and export revenue effects, using (18) in the appendix, where we provide further details of the model.

3.2 Data

We focus exclusively on preferences granted by the TRIAD to 48 LDCs under their GSP schemes. In the case of the E.U., these are simply ruled by the Everything But Arms (EBA) initiative, which generally provides for duty and quota free access, as the statistics in Table A3 indicate. In the case of the special treatment granted to LDCs under Japan's GSP scheme we are using their current preferences as introduced in 2002.[32] Finally, in the case of the U.S., the treatment is not homogenous across LDCs, as the variability in the average preference rate over different countries shows in Table A3. Non-African LDCs benefit from the extended preferences granted to all LDCs under the U.S. GSP scheme. We are using the LDCs preference rate as notified to the WTO in 1999, but there has been no change in this regime since 1997. Most African LDCs benefit from additional preferences through the African Growth Opportunity Act (AGOA), which adds 1835 tariff lines to the regular U.S. GSP program. More significantly, AGOA provides duty free access mostly without rules of origin requirements for apparel products originating in AGOA beneficiaries which are also LDCs (or that have an income per capita below $1000).[33]

The MFN tariffs for the TRIAD are taken from notifications to the WTO (2003 for Japan and the U.S. and 2004 for the E.U.). Because a number of tariff lines are subject to specific tariffs, and WTO notifications do not calculate ad-valorem equivalents for these tariff lines, we used the OECD

[32] See Handbook on the scheme of Japan 2002/2003 (UNCTAD/ITCD/TSB/Misc.42/Rev.2), available at www.unctad.org.

[33] The special apparel provision is subject to fulfilment of specific origin and visa requirements.

(2003) estimates of ad-valorem equivalents of specific tariffs. We also need information on tariffs in the rest-of-the-world to estimate the impact that a potential 33% reduction in bound tariffs in Doha will have on world prices.[34]

Import and export data comes from the UN's Comtrade. We take the average between 2001 and 2003 to smooth any year specific shock. If data is missing for a particular country, then we use data for 2000 to calculate the average. For the few countries for which there is no data available between 2000 and 2003, we mirror the data using partners' trade data. The partial equilibrium model also requires estimates of import demand and export supply elasticities at the tariff line level for *every* country in the sample. These are taken from Kee, Nicita and Olarreaga (2004a, 2004b).[35] Table A3 in the Appendix provides some summary statistics. The export-weighted tariff faced by beneficiaries countries in the European Union is zero, whereas it can be non-zero in Japan and the United States. This is because the European Union has a very generous LDC specific preference program (Everything But Arms), whereas Japan and the United States preferences to LDC generally have exemptions. Notably, Bangladesh benefits from almost no preference on its $ 2.6 billion of exports to the United States, whereas it faces an export weighted tariff of almost 11 percent. Similarly Vanuatu faces an export-weighted average tariff of almost 18 percent on its 17 million dollar of exports to the United States. These LDCs represent a negligible share of total TRIAD imports, as assumed in the model. Bangladesh's share, the largest, is only 0.17 percent of total TRIAD imports.

3.3 Empirical Results

Table 1 provides estimates of the subsidy that the TRIAD would pay in the absence of tariff reductions, which, as we previously noted, is equal to the tariff revenue currently forgone due to preferences given to LDCs. The total value is $763 million, of which the largest share is the E.U.'s because of three factors. First, the E.U. imports larger quantities from LDCs than Japan and the U.S. Second, European preferences tend to be more generous under the EBA than under the LDC regimes of Japan and the U.S. (including AGOA in the case of the U.S.), as we can see from Table A3. Third, the MFN tariffs

[34] We have an additional 130 countries in the data set. The tariff data come from different sources and we employ the most recent year for which data is available between 1999 and 2004. Sources are UNCTAD's TRAINS, WTO notifications and OECD (2003) CD-ROM, as well as the earlier 2001 version.

[35] When elasticities were not estimated for particular countries in those studies we took the trade-weighted average across all countries for those products. In the case of export supply elasticities, where for some tariff lines they were not able to estimate export supplies at the six-digit level, we took the country specific average across all tariff lines within the four digit level.

of the E.U. on the type of goods exported by LDCs tend to be higher.

The second column of Table 1 provides the amount of the subsidy after a 33 % reduction in bound tariffs by all WTO members. The subsidy tends to be larger than the currently forgone tariff revenue because exports from SRCs increase due to the world price rise, which is itself caused by the multilateral tariff reductions. The total subsidy to SRCs granted by the TRIAD amounts to $768 million, and again 88% of it is paid by the E.U.

Table 1. Budgetary impact of moving towards the subsidy scheme in Doha[a]

(millions of U.S. dollars)

	Subsidy (current MFN)	Subsidy (Post-Doha MFN)[b]	Cost of Switch (Post-Doha MFN)[c]	Preference Erosion (Post-Doha MFN)[d]
E.U.	669	674	208	441
Japan	31	32	6	17
U.S.	63	64	21	166
Total	763	768	235	624

Source: Authors calculations.

a. A decomposition of subsidies and preference erosion by SRC is provided in Table A1.

b. Assumes a 33% reduction in MFN tariffs by all WTO members. See (8).

c. Assumes a 33% reduction in MFN tariffs by all WTO members and an additional 8.3% for TRIAD. See (10).

d. Assumes a 33% reduction in MFN tariffs by all WTO members. See equation (17).

The third column of Table 1 provides an estimate of the budgetary cost implied by the move towards the subsidy scheme. As is clear from (9) this cost arises because the tariff charged on the imports from the SRC falls but the subsidy rate does not. Moreover, this shortfall applies to a larger volume of imports because the MFN tariff reductions increase world prices. The total budgetary cost for the TRIAD is $235 million, of which most is incurred by the E.U. The budgetary cost for Japan and the U.S. are marginal.[36] Note that the third column in Table 1 excludes the impact of additional MFN tariff reduction that the move towards the subsidy scheme would allow. This would change the amount of the subsidy as well as the tariff revenue collected on imports from SRCs and the rest of the world and will be accounted for in our welfare calculation in Table 2.

[36] As a comparison, $235 million represents around 2 minutes of TRIAD's agricultural support or 0.0001 %.

The fourth column provides an estimate of the extent of preference erosion that SRCs would suffer in each TRIAD market under a 33 % reduction in MFN tariffs and in the absence of a move towards a subsidy scheme, as defined in (17).[37] The preference erosion suffered by LDCs in TRIAD markets would be much larger than the budgetary cost for the TRIAD of moving towards a subsidy scheme. The LDC loss amounts to $624 million and the largest losses are incurred in the European market.[38] Table A1 provides estimates by country. We calculate this figure not simply because it is a common measure but because it is significant for the purposes of identifying the countries that are, or should be, most opposed to MTL liberalization on the basis of its impact on preference erosion. If these countries gain considerably from switching to the subsidy a large obstacle to MTL may be removed. The three countries that would face the largest losses due to erosion in absolute terms are Bangladesh ($202 million), Malawi ($151 million), and Madagascar ($63 million). As a share of GDP the top three losers would be Malawi (8.6%), Lesotho (2.7%) and Sao Tome and Prince (1.6%). Finally, the results show that the losses from preference erosion are concentrated in that for 26 of the 48 countries they would represent less than 0.1% of GDP.

Although the switch towards the subsidy scheme has negative budgetary consequences for the TRIAD, this does not imply it is not in the interest of those countries. Indeed, as the scheme provides for extra liberalization, the budgetary cost could potentially be compensated by the additional welfare gains derived in (14). Table 2 provides the estimate of the net welfare impact including this extra liberalization on products subject to LDC preferences, given by (12) for SGCs. The annual gain for the TRIAD is $2934 million and those governments should therefore be in favor of the switch. The largest gain is for the E.U., $2336 million. Japan and the U.S. would also gain–$237 million and $361 million, respectively.[39]

Importantly, the group of 48 LDCs also benefits from a switch to the subsidy.[40] If changes in welfare are much larger for the TRIAD when measured in absolute $ levels, relative to GDP the changes in welfare are much large for LDCs (around 50 times larger). The aggregate gain for LDCs per year is $520

[37] All numbers for LDCs exclude Kiribati for which there is no data available.

[38] Previous estimates were around $530 million (see Subramanian, 2004). There are two main reasons for our larger numbers. First, our *estimated* elasticities of export supply in LDCs are on average 5, which is larger than the value of *assumed* for all goods in the WTO document, one. Second, our MFN tariffs include ad-valorem equivalents of specific tariffs leading to larger preference erosion.

[39] The results do not appear to be driven by specific products such as sugar, which as we discuss in the introduction provides an important example of the effects we discuss. Excluding sugar the welfare gain for the EU is only $72 million lower.

[40] There are 49 countries classified as LDCs but there is no data available to compute welfare gains for Kiribati.

million, as shown in Table 2 and all but one gain. The loss for Djibouti, which is due to a deterioration of its terms of trade associated with the extra TRIAD liberalization, is marginal ($0.07 million). There are 27 LDCs that will remain indifferent with net welfare changes below 0.1 % of GDP). The largest absolute gains are for Bangladesh ($176 million), Malawi ($117 million) and Madagascar ($53 million). In relative terms, it is Malawi (6.7%), Lesotho (2.1%) and Sao Tome and Prince (1.3%). Recall that these were exactly the countries that stood to lose the most from preference erosion. So, if faced with a choice between the preference and the subsidy scheme, the LDCs should support the latter and the additional MTL it entails.

Table 2. Annual welfare cost of LDC preferences as a stumbling block[a,b]

	Mill. US $	% of GDP[c]
TRIAD countries (total)	2934	0.013
E.U.	2336	0.027
Japan	237	0.006
U.S.	361	0.004
LDCs	520	0.518
Rest of the world	900	0.010
Total	4354	0.010

Source: Authors calculations.

a. See table A2 for welfare estimates for LDCs.

b. Estimate based on (12) and (16).

c. The GDP used to express welfare gains is for 2002 and is in current US $.

Importantly, the group of 48 LDCs also benefits from a switch to the subsidy.[41] If changes in welfare are much larger for the TRIAD when measured in absolute $ levels, relative to GDP the changes in welfare are much large for LDCs (around 50 times larger). The aggregate gain for LDCs per year is $520 million, as shown in Table 2 and all but one gain. The loss for Djibouti, which is due to a deterioration of its terms of trade associated with the extra TRIAD liberalization, is marginal ($0.07 million). There are 27 LDCs that will remain indifferent with net welfare changes below 0.1 % of GDP). The largest absolute gains are for Bangladesh ($176 million), Malawi ($117 million) and Madagascar ($53 million). In relative terms, it is Malawi (6.7%), Lesotho (2.1%) and Sao Tome and Prince (1.3%). Recall that

[41] There are 49 countries classified as LDCs but there is no data available to compute welfare gains for Kiribati.

these were exactly the countries that stood to lose the most from preference erosion. So, if faced with a choice between the preference and the subsidy scheme, the LDCs should support the latter and the additional MTL it entails.

The rest of the world gains $900 million, with 108 countries experiencing a gain and 11 a loss. However, the country with the largest loss is Nigeria with $0.6 million. On the other hand, welfare gains are as high as $167 million for China. We recall that the gains for the rest of the world occur as a result of the additional liberalization made possible by switching to the subsidy scheme.[42]

We think that the aggregate welfare effect of $4354 million is likely to be a lower bound of the cost of PTAs as a stumbling block for MTL because we focus only on preferences to small developing countries. Even for this subset we believe that our estimates are a lower bound for several reasons. First, we recall that it refers to a yearly effect. Given the static model that we use if there were no further shocks after the implementation of the subsidy scheme the discounted welfare effect would be several times higher. Second, to calculate the welfare effects we employ a static perfect competition model with no externalities, which is well known to provide relatively small gains from trade liberalization.[43] Third, when we compute the effect of the additional liberalization by the TRIAD we do not add any reciprocity effects. In practice, we would expect that the TRIAD would attempt to negotiate further reductions from other countries.

4 Implementation, scope and refinement of the subsidy scheme

4.1 Implementations issues

We have already analyzed the budgetary cost of a switch to the subsidy scheme. Any costs from setting up and running the subsidy are unlikely to be significantly larger than those of running the preference scheme that it would replace.[44] However, we now briefly discuss some simple differences that may be present in running each scheme.

When the value of the subsidy and tariff rate are identical the two are exactly equivalent both in terms of their effects on prices and quantities and actual implementation. The exporter receiving a

[42] Note that for non-LDC countries our welfare estimates do not include the effects associated with preference erosion in the TRIAD markets.

[43] As a benchmark this model predicts that a 33% reduction in all MFN tariffs in the world provides a net welfare gain of approximately only $47 billion.

[44] The main reason for this is that many of the procedures and requirements for a subsidy to be granted to a specific shipment are already in place. For example a shipment must be inspected to ensure that the goods are eligible for preferential treatment and the exporter must provide evidence of compliance with rules of origin.

preference obtains $p^w + t$ per unit, the domestic price in the preference granting country, as soon as the shipment is considered eligible. The importer pays $p^w + t$.[45] Under the subsidy the exporter receives $p^w + s$, which is equal to $p^w + t$ when $t = s$, because if a buyer offers less there is always another buyer willing to pay up to $p^w + t$ in the preference granting country. The buyer actually pays $p^w + t + s$ before he receives the rebate equivalent to the amount of the subsidy per unit s. If this is done at customs then the buyer's price is simply $p^w + t$.[46] Here the subsidy is implemented as an immediate drawback scheme. Drawback schemes already exist in the TRIAD to rebate import duties when the imported good is re-exported or used as an input in the production of an exported good. The objective of the drawback with an import subsidy is different but the mechanics are identical. This discussion should also make clear that the subsidy scheme is no more or less transparent than the preference scheme. Therefore, political economy arguments that the subsidy scheme is somewhat more transparent, and thus less likely to be adopted by the government, are not convincing.

Two differences arise when the MFN rate falls to $t' < s$. The first is the direct budgetary cost that we already discussed: customs collects t' per unit and must rebate s. As our estimates show, to the extent that the subsidy scheme applies only to LDCs, this cost is small and can be financed directly out of tariff revenue.[47] We should also point out that, from the domestic legal perspective of the country granting preferences, the budget implications of a subsidy are no different from the ones with the preferences. In the U.S. for example any foregone tariff revenue from a new preference must be estimated and an alternative for its replacement in the budget must be offered. There are also precedents for the use of import subsidies in the E.U. for example.[48, 49]

The second issue that may arise after the MFN tariff falls below the subsidy is re-exports. After importing the good the buyer can ship it back to an agent in the SRC and re-export it. This transaction is only profitable if the excess subsidy, $s - t'$, is sufficiently high to offset the transaction cost. This includes the cost of forging the certification of the origin of the good and the two-way transport cost,

[45] We are assuming that there are no intermediaries and the importer does not capture any of the preferential rents. There is some evidence that in practice these rents may be divided between exporter and importer. (Olarreaga and Ozden [2005])

[46] If there is a friction such that the subsidy rebate is uncertain or delayed so that the importer expects to receive only a fraction of it then the exporter price will be reduced accordingly.

[47] For example it is about $21 million for the U.S. whereas its tariff revenue in 2003 was nearly $20 billion.

[48] "Where the supplies [of sugar] available within the Community or a major consuming region are no longer sufficient, import subsidies may be granted." In Council Regulation (EC) No 1260/2001 of 19 June 2001 on the common organization of the markets in the sugar sector.

[49] Winters (2004) suggests devoting 25 % of the funds saved by reducing trade-distorting agricultural support to a compensation fund, which would help compensate for preference erosion. Our calculations suggest that 0.0001 % would be enough to compensate LDCs provided the subsidy scheme was implemented.

which in most goods will make it unprofitable particularly if the origin country is an LDC since they typically have high transport costs.[50] If we add to this the foregone interest on the sale of the good because of the time that the two-way shipment takes it is unlikely that re-exports would be profitable.[51]

4.2 Scope and refinements

In deciding which countries the subsidy should apply to there may be room for a finer distinction. The rationale of our model applies more strongly to countries that are "strategically large", that is whose cooperation in certain non-trade issues is important to the country granting the preference. Proposals to "buy-out" preferences, that is to offer a lump-sum payment in exchange for the elimination of unilateral preferences, or provide temporary adjustment assistance through grants (Hoekman [2004]) or loans (IMF [2004]), are unlikely to work for those countries.[52] For example, the U.S. had the opportunity to offer only cash for Colombia's cooperation on the war on drugs and it chose not to.

Other countries are not strategically large and receive preferences, under the GSP for example, simply because they belong to a group that is eligible for them. For the latter set of countries a buy-out is feasible and would remove their opposition to MTL due to preference erosion. However, it is impossible to make any general claim about whether such a buy-out would represent an improvement for those countries. Among other things this would depend on whether the preferences caused investment in sectors with a comparative advantage, the eventual use of the money from the buy-out and its opportunity cost.

The subsidy scheme we analyzed until now mimics preferences in terms of the production incentives it provides for preference receiving countries. Therefore this particular form of the subsidy will not appeal to critics of preferences that argue they caused investment in sectors where the countries had a comparative disadvantage in (e.g. Tangermann [2002]). But our constraint that the subsidy rate equal the current preference rate is simply a convenient benchmark to evaluate the welfare effects. In fact, if

[50] For evidence on the importance of transport costs for LDCs see Limão and Venables (2001).

[51] If re-exports were a problem one solution would be to implement the subsidy rebate only when the good was internally sold. Since internal sales entail the payment of value added tax this would serve as an additional wedge that would have to be overcome in order for re-exports to be profitable.

[52] The IMF's proposed program is in the form of loans to finance temporary adjustment costs if the MFN tariff reductions cause a significant balance of payment effect on the beneficiary countries. Even if this program compensated for the full amount of preference erosion it would not be able to deliver the same MFN tariff reduction as the subsidy proposed. The reason for this is that after the MFN tariff reduction the granting countries can only threaten to remove a smaller amount of preferences. Thus they will be able to extract less in the form of side conditions than before the MFN reduction (or subsidy scheme). This implies that the granting countries themselves will offer fewer MFN reductions under the IMF program than under the subsidy scheme.

we believe that the pattern of export specialization from all preference receivers should be more closely aligned with relative world prices then the solution is simple: for each of them use a fixed subsidy rate that is equal for all the products it exports to all preference granting countries. This maintains the relative prices in the receiver equal to the world's relative prices. So the subsidy can be designed in a way that addresses problems of specialization in the wrong sector and still minimizes the stumbling block effect.

5 Conclusion

The large numbers of recent PTAs suggest that policy makers have decided they are desirable. Nonetheless the potential costs of these agreements in terms of their effect on multilateral liberalization must be estimated and taken seriously. In this paper we described recent theoretical and empirical evidence that preferential liberalization can slow down multilateral liberalization even when the countries receiving the preference are small from a trade perspective. As large developed countries often use unilateral preferences to small countries as a payment for cooperation in non-trade issues they will hold back their own MTL to be able to provide preferential tariffs below the MFN value. In this setup, decoupling preferences from MFN liberalization can be Pareto improving provided that the alternative policy is designed to target the problem. Our proposal is conceptually very simple; use import subsidies, possibly with the initial rate fixed at the current preference. As we argued the subsidies would ensure that the countries that receive preferences would move from opposing MFN reductions in the granting countries to supporting it. The granting countries could maintain their preferential treatment, now via subsidies, and thus continue to extract cooperation from those countries in a range of other issues on which preferences are conditional.

We provide the first estimates of the welfare costs of PTAs as a stumbling block to multilateral liberalization. Our focus is on the subset of preferences that the E.U., U.S. and Japan extend to LDCs and we use the import subsidy scheme as a feasible counterfactual to calculate the opportunity cost of these preferences. This cost is $2934 million per year for the TRIAD, or, to put it differently, the E.U., U.S. and Japan would gain $2934 million per year if they switched from the preference to the subsidy scheme in the context of the liberalization anticipated in the Doha round. This occurs because under the subsidy those countries can now further reduce their MFN tariffs without negatively affecting the benefits associated with the "side payment". The switch would also increase annual welfare in LDCs by $520 million and in the rest of the world by $900 million.

The aggregate annual welfare cost of $4354 million generated by these preferences is likely to be a lower bound. First, it applies only to the unilateral preferences extended to a subset of countries and estimates of the stumbling block effect are larger when they apply to all PTA partners, so there would be a bigger potential for MTL if the switch applied to all of the TRIAD's PTAs. Second, to estimate the effects at the product level we must use a model with no dynamic gains from trade. Finally, it is still *possible* that the issue of preference erosion could derail the Doha round, which would imply that the relevant counterfactual under the preference scheme would entail no MTL and consequently be at least an order of magnitude costlier than we estimate: in the context of our simple model this would entail an additional gain of $47 billion per year.

In terms of implementation, the budgetary costs, that are often raised when a subsidy is discussed, are small, at least in the case of the TRIADS' preferences to LDCs. Moreover, as we argued above, the logistical costs of running the subsidy scheme are in principle not significantly higher than the ones associated with the preference scheme. However, in implementing the subsidy scheme two questions would have to be addressed: its legality in the WTO and its scope. From a legal perspective the subsidies conflict with the MFN principle. However, this could easily be addressed in the same way as preferences, which also constitute exceptions to MFN and are allowed either through the Enabling Clause or article XXIV for example. In terms of the scope we must consider if the proposal should extend to all countries that receive unilateral preferences. The basic argument in answering this question is identical to the one presented for LDCs. Naturally the budgetary cost for the TRIAD would be higher but the additional MFN liberalization that would result may be sufficient to offset it. Extending the group beyond LDCs may have an additional advantage. Under the subsidy the beneficiaries gain from MFN liberalization in the TRIAD and therefore the large traders among the beneficiaries would have an incentive to engage in reciprocal trade liberalization.

A broader question is whether all PTAs, and not simply ones featuring unilateral preferences, should be replaced with a subsidy scheme. Conceptually the problem of preference erosion occurs whenever a preference over the MFN rate is given. Moreover, there is evidence of other types of PTAs by the E.U. and the U.S. that have slowed down their respective MTL. So similar exercises can be carried out to calculate the welfare costs of these other PTAs. [53] However, to provide a full characterization of the effect of PTAs on MTL this should be complemented with evidence on the effect of NAFTA on Canada

[53] Limão (2005) finds that NAFTA and other U.S. PTAs also slowed down its multilateral liberalization. Karacavaoli and Limão (2005) find that the E.U.'s PTA with the Central European and with the EFTA countries had a similar effect.

or Mexico's MTL and the E.U.'s PTA partners. To the extent that the U.S. and the E.U. are the largest traders the evidence for them must carry a considerable weight but additional studies of the effects of PTAs by smaller countries on their MTL would also be useful in determining whether all PTAs should be decoupled from MFN liberalization through an import subsidy or some other alternative. This broader question should be addressed in future research.

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Appendix

World partial equilibrium model

The change in export revenue and import revenue associated with a change in tariffs for good i is:

$$\begin{aligned} \hat{x}_{ic}^{rev} &= (1+\epsilon_{xi,c})\hat{p}_i^w \\ \hat{m}_{ic}^{rev} &= (1+\epsilon_{mi,c})\hat{p}_i^w + \epsilon_{mi,c}\hat{t}_i \frac{t_{ic}}{1+t_{ic}} \end{aligned} \tag{18}$$

where $\hat{x}_{ic}^{rev}$ and $\hat{m}_{ic}^{rev}$ are respectively the percentage changes in export and import revenue and $\epsilon_{xi,c}$ and $\epsilon_{mi,c}$ are the elasticities of export supply and import demand of good i in country c. The change in world prices is obtained by assuming that world markets are in equilibrium:

$$\sum_c x_{ic} = \sum_c m_{ic} \tag{19}$$

Totally differentiating (19) with respect to changes in tariffs and world prices, and then solving for the percentage change in world prices yields:

$$\hat{p}_i^w = \frac{\sum_c \epsilon_{mi,c}\sigma_{mi,c}\hat{t}_{ic}\frac{t_{ic}}{1+t_{ic}}}{\sum_c \epsilon_{xi,c}\sigma_{xi,c} - \sum_c \epsilon_{mi,c}\sigma_{mi,c}} \tag{20}$$

where $\sigma_{mi,c}$ and $\sigma_{xi,c}$ are respectively the share of country c's exports and imports of i in total world trade. Note that the numerator in (20) only involves a sum over the product subject to preferences in the TRIAD when calculating the percentage change in world prices induced by the additional liberalization that the move towards the subsidy scheme implies. In this case we use the import and export shares as well as the MFN tariff that arise after the initial 33% reduction in tariffs to evaluate (18).

Preferential programs and the GATT/WTO

The MFN clause in Article I of GATT 1947 requires that "any advantage, favor, privilege or immunity granted by any contracting party to any product originating in or destined for any other country shall be accorded immediately and unconditionally to the like product originating in or destined for the territories of all other contracting parties." On its own MFN precludes PTAs. However, there are three provisions in the WTO that allow exceptions to MFN: a PTA is GATT-legal if it falls under article XXIV, the Enabling Clause or article V of GATS (trade in services). Article XXIV, under which PTAs among developed countries typically fall, can be used by any country if (i) the tariff reductions are reciprocal and eventually zero, (ii) the agreement covers substantially all trade and, (iii) when a common external tariff is adopted, it does not exceed the average of the existing tariff of the member countries in the preferential agreement prior to it. These conditions are waived for PTAs among developing countries under the Enabling Clause, which also encompasses GSP. The GSP was originally granted as a 10-year waiver from MFN in 1971 and according to it developed countries may offer tariffs below the negotiated MFN values to developing countries. In addition to these three provisions countries use ad-hoc temporary waivers to provide unilateral preferences to individual countries, e.g. the U.S.'s Caribbean Basin Initiative and Andean Trade Pact and the E.U.'s Cotonou agreement.

In section 3.3 we focus on unilateral tariff preferences granted by the TRIAD to LDCs, which generally go beyond the GSP preferences available to non- LDCs. Under its Everything But Arms (EBA) initiative, the E.U. grants duty free and quota free access to all products (except arms) originating

in LDCs since March 2001. A transition period was provided for the phasing out of tariffs on sugar, rice and bananas until 2009. Under Japan's preferential scheme, the LDCs benefit from duty free and quota free access for all their manufacturing exports. The number of LDCs agricultural and fishery products that can enter duty free increased to around 50 items after a reform in April 2003. Half of U.S. tariff lines (around 4500) offer duty free access under the GSP program. Since May 1997 LDCs are offered duty free access on an additional 1783 tariff lines. Under AGOA 23 LDCs are offered duty free access on an additional 1835 tariff lines.

Imports from LDCs amounted to $8 billion for the E.U. (2001), $1 billion for Japan and $7 billion for the U.S. Estimates by UNCTAD (2003) suggest that 99.8% of dutiable E.U. imports from LDCs are covered by their LDCs preferences, that figure is 44% for the U.S. and 53 for Japan. The utilization rate of those preferences is 76% for the E.U., 57% for Japan and 96 percent for the U.S. Bangladesh and Cambodia are the top beneficiaries of tariff preferences among LDCs in the E.U. and Japan. Madagascar and Malawi are the main beneficiaries of U.S. preferences.

Side conditions

GSP and other unilateral preferences provided by the U.S. and the E.U. often have side conditions attached that are valued by the preference-granting country and potentially costly to the recipient. That is these unilateral preferences, to whatever extent they are used, are not free to developing countries.

Consider GSP for example. Although GSP was designed to promote the development of poorer countries based on an infant industry argument.(UNCTAD [1964]) and it does not require reciprocal trade concessions on the part of the developing countries in the context of the GATT "during the last twenty-five years or so the experience of the GSP in the GATT system has been that for a number of reasons the preference-granting national entities (i.e. the industrialized countries) often succumb to the temptation to use the preference systems as part of 'bargaining chips' of diplomacy." (Jackson, p.160) This has been possible partly because "the preferences extended under the GSP are privileges rather than enforceable rights." (UNCTAD [2000], p.19) This means that granting countries can withdraw preferences in a GATT-legal way, that is without being subject to GATT sanctioned retaliations.

Both the U.S. and the E.U. explicitly offer reductions in trade barriers in exchange for cooperation on various non-trade issues such as labor, environment, drug trafficking and intellectual property. Examples of these have included the Eastern European and Mediterranean agreements signed by the E.U.; the U.S.'s agreements with Jordan, Mexico and other Latin American and Caribbean countries; and the preferential treatment that the E.U. and the U.S. extend to most developing countries through GSP.[54]

The legality of some of the additional preferences that are given only to sub-groups of developing is currently being challenged in the WTO; however the practice is still prevalent.[55] Moreover, even if the unilateral schemes being challenged are replaced by PTAs that require a reduction in the small country's protection the compliance with the side conditions will continue to play a key role in the developed country's desire to pursue those agreements. A final implication of this is that the model that we discuss in section 2.1 applies not only to the case of unilateral preferences but whenever cooperation in non-trade issues in the context of a PTA is an important component.

[54] See USITC 1994 and 1996 for conditions applying to the ATPA. See Bayard and Elliot (1994) and UNCTAD (2000) for details on conditionality in the GSP program. See Perroni and Whalley (2000) for details on conditionality in Nafta. See Winters (1993) for details on the E.U.'s Eastern European, Mediterranean and GSP programs, the latter is also described by UNCTAD (2002).

[55] India has challenged the preferences that the E.U. grants to Pakistan and other countries for cooperation on drugs.

Table A1: Preference erosion and subsidy by Beneficiary Country (millions of US$)[a]

SRC		European Union		Japan		United States	
name	code	Pref. erosion	Subsidy	Pref. erosion	Subsidy	Pref. erosion	Subsidy
Afghanistan	AFG	0.28	0.64	0.00	0.00	0.00	0.00
Angola	AGO	3.08	4.10	0.07	0.20	0.00	0.00
Bangladesh	BGD	193.61	346.86	6.55	11.17	1.90	2.48
Benin	BEN	0.61	1.19	0.00	0.00	0.00	0.00
Bhutan	BTN	0.04	0.11	0.00	0.00	0.01	0.01
Burkina Faso	BFA	0.55	1.19	0.00	0.00	0.00	0.01
Burundi	BDI	0.03	0.05	0.00	0.00	0.00	0.00
Cambodia	KHM	20.80	41.74	5.40	10.76	0.17	0.33
Cape Verde	CPV	0.37	0.75	0.00	0.00	0.07	0.15
Centra Afr. R.	CAF	0.56	0.79	0.00	0.00	1.55	0.85
Chad	TCD	0.02	0.07	0.00	0.00	0.00	0.00
Comorros	COM	0.04	0.10	0.00	0.00	0.00	0.00
Congo	CON	0.27	0.47	0.00	0.01	0.01	0.02
Djibouti	DJI	0.05	0.11	0.00	0.00	0.00	0.00
Eq. Guinea	GNQ	0.02	0.04	0.00	0.00	0.00	0.00
Eritrea	ERI	0.29	0.45	0.00	0.00	0.00	0.00
Ethiopia	ETH	0.87	2.04	0.03	0.06	0.06	0.18
Gambia	GMB	0.58	0.87	0.05	0.08	0.00	0.01
Guinea	GIN	2.59	3.27	0.00	0.00	0.03	0.04
Guinea-Bissau	GNB	0.22	0.25	0.00	0.00	0.00	0.00
Haiti	HTI	0.23	0.37	0.01	0.01	1.08	2.61
Kiribati[b]	KIR	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Lao	LAO	6.77	13.02	0.12	0.30	0.00	0.00
Lesotho	LSO	0.25	0.29	0.00	0.00	22.90	18.78
Liberia	LBR	0.79	2.27	0.00	0.00	0.01	0.02
Madagascar	MDG	45.42	63.52	0.08	0.15	18.14	15.18
Malawi	MWI	40.77	39.64	0.01	0.01	110.28	25.42
Maldives	MDV	3.84	4.31	0.03	0.04	0.00	0.00
Mali	MLI	1.22	1.58	0.00	0.01	0.03	0.05
Mauritania	MRT	5.91	8.75	1.28	2.60	0.00	0.00
Mozambique	MOZ	11.17	14.21	0.00	0.00	0.02	0.04
Myanmar	MMR	20.55	37.85	1.79	3.59	0.12	0.33
Nepal	NPL	4.78	11.55	0.72	1.88	0.37	0.62
Niger	NER	0.48	0.90	0.00	0.01	0.02	0.04
Rwanda	RWA	0.03	0.09	0.00	0.00	0.00	0.01
Samoa	WSM	0.03	0.04	0.02	0.02	0.00	0.01
Sao Tome & P.	STP	0.77	0.93	0.00	0.00	0.00	0.01
Senegal	SEN	19.68	28.41	0.06	0.13	0.02	0.05
Sierra Leone	SLE	5.33	11.27	0.00	0.00	0.02	0.04
Solomon Isl.	SLB	2.01	2.14	0.20	0.34	0.00	0.00
Somalia	SOM	0.04	0.06	0.00	0.00	0.01	0.02
Sudan	SDN	0.84	1.41	0.00	0.01	0.00	0.00
Tanzania	TZA	28.22	30.98	0.04	0.09	8.29	3.15
Togo	TGO	0.55	0.96	0.00	0.00	0.01	0.04
Tuvalu	TUV	0.02	0.04	0.00	0.00	0.00	0.00
Uganda	UGA	8.12	7.82	0.00	0.00	0.01	0.03
Vanuatu	VUT	0.03	0.08	0.08	0.17	0.01	0.02
Yemen	YEM	1.12	1.42	0.02	0.04	0.00	0.00
Zambia	ZMB	6.38	9.72	0.00	0.00	0.40	0.63

[a] **Source:** Authors' calculations

[b] We do not have any export, import or tariff data on Kiribati.

Table A2: Changes in net Welfare by Least Developed Countries[a]

SRC name	SRC code	Welfare Change: Total (US$ million)	Welfare Change: Per capita (US$ per capita)	Welfare Change: over GDP[b] (percent)
Afghanistan	AFG	0.26	0.01	0.01
Angola	AGO	2.59	0.2	0.02
Bangladesh	BGD	175.72	1.31	0.36
Benin	BEN	0.53	0.08	0.02
Bhutan	BTN	0.05	0.06	0.01
Burkina Faso	BFA	0.48	0.04	0.02
Burundi	BDI	0.01	0	0
Cambodia	KHM	23.55	1.8	0.6
Cape Verde[c]	CPV	0.4	0.88	0.06
Centra Afr. R.	CAF	1.67	0.44	0.16
Chad	TCD	0.01	0	0
Comorros[b]	COM	0.04	0.07	0.02
Congo	COG	0.19	0.05	0.01
Djibouti	DJI	-0.07	-0.1	-0.01
Eq. Guinea	GNQ	0.01	0.02	0
Eritrea	ERI	0.25	0.06	0.04
Ethiopia	ETH	0.87	0.01	0.01
Gambia[b]	GMB	0.55	0.4	0.14
Guinea	GIN	2.21	0.29	0.07
Guinea-Bissau	GNB	0.17	0.12	0.08
Haiti[b]	HTI	0.78	0.1	0.02
Kiribati[d]	KIR	N.A	N.A.	N.A.
Lao	LAO	6.16	1.13	0.34
Lesotho[b]	LSO	18.14	10.26	2.09
Liberia	LBR	0.78	0.24	0.15
Madagascar	MDG	53.06	3.27	1.16
Malawi	MWI	116.94	11	6.66
Maldives	MDV	3.05	10.76	0.47
Mali	MLI	1.01	0.09	0.03
Mauritania	MRT	6.13	2.36	0.61
Mozambique	MOZ	9.47	0.52	0.25
Myanmar	MMR	19.96	2.6	1.23
Nepal	NPL	5.43	0.23	0.1
Niger	NER	0.45	0.04	0.02
Rwanda	RWA	0.01	0	0
Samoa[b]	WSM	0.05	0.29	0.02
Sao Tome & P.[b]	STP	0.65	4.26	1.32
Senegal	SEN	17.06	1.73	0.33
Sierra Leone	SLE	4.83	0.93	0.65
Solomon Isl.	SLB	1.84	4.21	0.67
Somalia	SOM	0.04	0	0
Sudan	SDN	0.53	0.02	0
Tanzania	TZA	29.82	0.86	0.32
Togo	TGO	0.53	0.11	0.04
Tuvalu	TUV	0.01	0	0
Uganda	UGA	6.65	0.27	0.11
Vanuatu	VUT	0.08	0.39	0.03
Yemen	YEM	0.84	0.05	0.01
Zambia	ZMB	5.95	0.59	0.16

[a] **Source:** Authors' calculations.

[b] GDP is for the year 2002 and it is measured in current US $.

[c] Excludes changes in tariff revenue due to lack of tariff data. The direction of the bias is unclear, but it is probably small since changes in tariff revenue represent on average less than 1 percent of the total welfare change.

[d] We do not have any export, import or tariff data on Kiribati.

Table A3: Descriptive statistics[a]

SRC code	European Union				Japan				United States			
	t^b (%)	t^{pc} (%)	Imports (mill. $)	Share[d] (%)	t^b (%)	t^{pc} (%)	Imports (mill. $)	Share[d] (%)	t^b (%)	t^{pc} (%)	Imports (mill. $)	Share[d] (%)
AFG	1.2	0	53	0.002	3.1	0	0	0.000	0.5	0.3	1	0.000
AGO	0.6	0	683	0.030	7.8	0.4	3	0.001	0	0	170	0.014
BGD	11.5	0	2905	0.127	17.4	0	117	0.033	10.8	10.7	2595	0.220
BEN	2.4	0	49	0.002	NA[e]	NA	0	0.000	0.8	0.1	2	0.000
BTN	3.6	0	3	0.000	8.1	2.8	0	0.000	3.3	2.3	1	0.000
BFA	3.6	0	34	0.001	8.3	2.7	5	0.001	3.2	3	3	0.000
BDI	0.2	0	34	0.001	6.7	5.6	1	0.000	0	0	8	0.001
KHM	12.5	0	321	0.014	23.9	0	52	0.015	11.4	11.4	877	0.074
CPV	5.5	0	13	0.001	7.8	0	0	0.000	3.1	0	5	0.000
CAF	0.4	0	208	0.009	NA	NA	1	0.000	29.2	0.1	3	0.000
TCD	0.6	0	11	0.000	2	0	0	0.000	0	0	5	0.000
COG	1.6	0	179	0.008	1.4	0.5	20	0.006	0.5	0.5	173	0.015
COM	1.7	0	6	0.000	0.7	0	0	0.000	0.9	0	0	0.000
DJI	2.3	0	5	0.000	NA	NA	0	0.000	3.3	0.2	0	0.000
GNQ	1.4	0	35	0.002	0	0	43	0.012	0	0	49	0.004
ERI	4.8	0	9	0.000	2.5	0	0	0.000	7.9	7.8	0	0.000
ETH	0.9	0	218	0.010	9.4	0	59	0.017	0.6	0	31	0.003
GMB	2.8	0	30	0.001	8.7	4.4	4	0.001	3.6	1.5	0	0.000
GIN	1.6	0	204	0.009	8.5	0.3	3	0.001	0.7	0.3	10	0.001
GNB	8.1	0	4	0.000	NA	NA	0	0.000	0.1	0	0	0.000
HTI	2.1	0	17	0.001	5.1	0	1	0.000	13.5	12.6	302	0.026
KIR	4.8	0	0	0.000	2.6	1.8	14	0.004	0.1	0	1	0.000
LAO	10.7	0	118	0.005	3.2	0	12	0.003	15.6	15.6	10	0.001
LSO	1.3	0	21	0.001	NA	NA	0	0.000	11.2	0	146	0.012
LBR	0.7	0	373	0.016	4.9	0.6	0	0.000	0	0	47	0.004
MDG	11.8	0	521	0.023	8.9	1.2	25	0.007	10.1	0	132	0.011
MWI	23.1	0	155	0.007	5.6	4.3	52	0.015	37.5	0	58	0.005
MDV	17.2	0	24	0.001	9.3	0.1	4	0.001	10.8	10.8	99	0.008
MLI	4.2	0	37	0.002	3.1	0	1	0.000	0.9	0.3	9	0.001
MRT	2.6	0	325	0.014	8.3	5.2	80	0.023	7.2	6.4	0	0.000
MOZ	9.6	0	146	0.006	0.6	0	23	0.007	0.3	0	26	0.002
MMR	11.7	0	342	0.015	9.2	0.9	118	0.034	13	12.9	506	0.043
NPL	6.9	0	162	0.007	6.8	0	28	0.008	9.1	8.9	251	0.021
NER	1	0	92	0.004	5.6	0.2	1	0.000	0.7	0.1	7	0.001
RWA	0.3	0	30	0.001	2.6	0	0	0.000	0.1	0	5	0.000
WSM	6	0	1	0.000	13.7	1	0	0.000	1.6	1.4	6	0.000
STP	8.6	0	11	0.000	5.1	0	1	0.000	2.1	0.3	0	0.000
SEN	8.6	0	321	0.014	8.2	5.4	6	0.002	1.5	0	4	0.000
SLE	8.1	0	135	0.006	8.4	0	1	0.000	2	1.1	4	0.000
SLB	16.8	0	12	0.001	2.5	0	23	0.006	0.2	0.1	0	0.000
SOM	3.1	0	2	0.000	NA	NA	0	0.000	4.1	0.5	0	0.000
SDN	1.5	0	106	0.005	8.3	5.3	22	0.006	0	0	2	0.000
TZA	9.8	0	301	0.013	2.9	0.2	45	0.013	9	0	32	0.003
TGO	2.4	0	40	0.002	5.8	0	0	0.000	3	0.3	5	0.000
TUV	5.3	0	1	0.000	NA	NA	0	0.000	10	8.9	0	0.000
UGA	3.7	0	199	0.009	4.5	3.9	12	0.003	0.1	0	23	0.002
VUT	4.2	0	2	0.000	22.8	17.8	17	0.005	2	0	1	0.000
YEM	4.5	0	46	0.002	7.4	5.8	19	0.005	0	0	5	0.000
ZMB	8.9	0	105	0.005	0	0	93	0.026	3.6	0	17	0.001

[a] See Data section in the text.

[b] Import weighted MFN tariff. Import weights are for imports from the SRC.

[c] Import weigthed preferential tariff. Import weights are for imports from the SRC.

[d] Share of each SRC in total TRIAD member imports.

[e] NA occurs when either Japan has no imports from that particular SRC or when we have no tariff data available on any of the products imported from that country.