The Value of Preferential Market Access[°]

Marco Fugazza[×] and Alessandro Nicita[⊗]

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Abstract

One of the consequences of the proliferation of preferential trade agreements is that a large share of international trade is not subject to the most favored nation tariff, but enters markets through preferential access. Preferential access affects trade because, by providing some countries with a relative advantage, it is essentially a discriminatory practice. This paper examines the extent to which preferential access have affected bilateral trade flows. The empirical approach consists first in providing two indices: one summarizing direct market access conditions (the overall tariffs faced by exports) and one measuring relative market access conditions (the overall tariffs faced by exports relative to those faced by competitors). Then, the indices are used in a gravity model in order to estimate how changes in market access conditions affect international trade. The results indicate that preferential access matters. Although direct market access conditions are more influential, the relative advantage provided by the structure of preferences affects the magnitude of bilateral trade flows. That is, bilateral trade flows depend upon the advantage provided by the system of preferences vis-à-vis other competitors.

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[×] UNCTAD - Division of International Trade and Commodities. Email: marco.fugazza@unctad.org.

[⊗] Corresponding author. UNCTAD - Division of International Trade and Commodities. Palais des Nations CH-1211 Geneva 10, Switzerland. Email: alessandro.nicita@unctad.org. Tel: +41-229175685

1. Introduction

In the past twenty years, trade liberalization has been used as an effective development tool, based on the evidence that there are many benefits that a country can gain through a more active participation in world trade. While tariff liberalization was initially pursued through trade agreements under the auspices of the World Trade Organization (WTO), preferential trade agreements (PTAs) are the basis behind the recent trade liberalization process. The proliferation of PTAs in the recent past has been impressive. In 1994, at the launch of the WTO only 37 such agreements were in place. By 2008 more than 200 of them had been implemented with more in the implementation stage. Participation in regional and bilateral trade agreements is widespread, as virtually all members of the WTO have notified participation in one or more PTAs. One consequence of the large number of PTAs is that an increasing share of international trade is not subject to the most favored nation (MFN) tariff, but enters markets through preferential access.[1] Preferential access affects trade because, by providing some countries with a relative advantage, it is essentially a discriminatory practice.

In general, the existing literature on the effects of trade liberalization suggests that preferential access has a large impact on trade flows. For example, Baier and Bergstrand (2007) find that the average impact of free trade agreements is to double the bilateral trade after a 10 year period. Similarly, Magee (2008) in estimating the anticipatory and long-run impact of PTAs, finds that PTAs have increased trade among members by an average of 90 percent. Baier and Bergstrand (2009) using a nonparametric estimation find substantially similar results (doubling of trade among members) in the long-run effects of the European Economic Community and the

[1] Although 40 percent of world trade is free under MFN regimes, an additional 30 percent is exempted from tariffs because of preferential access.

Central American Common Market. Carrère (2006) examines the effects of seven regional trade agreements and finds that they have resulted both in trade creation and trade diversion, often to the expense of non-member countries. Lee and Shin (2006) analyze East Asian free trade agreements and find an increase in trade among members as well as trade diversion depending upon certain characteristics of member countries (proximity and shared land borders). Clausing (2001) and Calvo-Pardo, Freund and Ornelas (2009) find trade creation but no trade diversion effects with regard to the US-Canada FTA and the ASEAN regional trade agreement.[2] Most of the literature has generally examined the overall impact of PTAs as a discrete event rather than focusing on tariff liberalization.[3] Such approach captures not only tariff changes but also any advantage that PTAs can carry, such as customs harmonization, a reduction in non-tariff measures, trade facilitations and a decline in other trade costs. Although quite informative, an approach which examines the overall impact of PTAs is not suitable for isolating isolate the effect of tariff preferences on bilateral trade.

This paper adds to the existing literature by specifically examining the effects of changes in market access conditions in terms of tariffs, whether they are caused by PTAs, multilateral or unilateral liberalization. In doing so, this paper provides two contributions. The first is two indices measuring market access conditions that take into account the complex structure of tariff preferences. These indices are calculated at the bilateral level in order to summarize market access conditions affecting each bilateral trade relationship. One index summarizes the tariffs faced by exports and is related to the work on trade restrictiveness (Kee, Nicita and Olarreaga, 2008 and 2009). The other

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[2] One dissenting study is Ghosh and Yamarik (2004). In their analysis of 12 regional trade agreements they are skeptical about the results of the previous literature on a positive trade creation effect. The use of fixed-effect estimation in the subsequent literature has somewhat alleviated their criticism.

[3] One exception is a study by Robertson and Estevadeordal (2009). Their findings suggest that the tariff liberalization of Latin American countries between 1985 and 1997 caused trade-diverting effects.

index measures the relative tariff advantage or disadvantage that the tariffs provide vis-à-vis other competitors and builds on the work on preferential margins (Hoekman and Nicita, 2008; Carrère, de Melo and Tumurchudur-Klok, 2008; and Low, Piermartini and Richtering, 2009). Second, this paper contributes to the literature by examining whether trade between two countries depends not only on changes in the tariff applied to trade, but also on market access conditions applied to third countries. The empirical approach to measure the extent to which changes in market access conditions affect international trade consists of a gravity model (Linder, 1961; Linnemann, 1966; Anderson and van Wincoop, 2003, Baier and Bergstrand, 2007) augmented by the two indices.

The results indicate that bilateral market access conditions have constantly improved during the period of analysis and that the system of preferences is on average not very discriminatory. However, both indices have large variance indicating that in some cases preferential access does provide a substantial advantage. The results indicate that, although tariffs applied on trade are the most important, relative market access conditions also have an impact on trade flows. That is, bilateral trade flows are found to be larger the greater is the relative advantage provided by the system of preferences. On average, an improvement of one percentage point in the index summarizing the tariff applied on exports increases trade by about 0.7 percent, while for every percentage point increase in relative market access bilateral trade increases by slightly more than 0.3 percent. These figures indicate that tariff changes since 2000 have increased trade for the average country by 1.5 percent. Still, looking beyond averages, the results show a large variance indicating that for some countries changes in market access conditions have produced substantial effects on trade.

This paper is organized as follows. The next section illustrates the empirical approach for assessing the impact of preferential access on trade flows. Section 3 briefly

summarizes the data. Section 4 provides some statistics on market access measures and discusses their impact on trade flows. Section 5 concludes.

2. Market access and trade flows

In the last decade, market access conditions have increasingly been affected by bilateral trade agreements. Trade agreements generally provide trading partners with lower tariffs and as a result, different tariff rates are applied to the same product depending on its origin. As of 2007, in only 40 percent of international trade there is no discrimination as each given country apply the same tariff to all trading partners (at the HS6 digit product). About 30 percent of trade is in products where there are two different tariff rates, and about 15 percent is in products with three different tariff rates. The remaining 15 percent of trade consists of products for which there are four or more different tariff rates.

From an exporter's perspective, market access depends not only on the disadvantages that exporters face versus domestic producers, but also on the relative advantages or disadvantages that exporters have versus other external competitors. Tariffs affect both of these components. In tariff terms, the disadvantage versus domestic competitors is simply given by the tariff applied to the specific good, while the advantage or disadvantage versus other competitors is given by the preferential margin.

Preferential access can be thought of as a policy that provides comparative advantage when countries discriminate across trading partners by providing some countries with lower tariffs. For example, high income countries often grant non-reciprocal preferential access to least developed countries in order to facilitate the latter's economic growth by providing an incentive to their exports. Likewise, regional

trade agreements are a common form of reciprocal preferential access in which lower (or zero) tariffs are applied to products originating among members, so as to foster trade cooperation. Agreements as such, by providing some trading partners with a lower tariff, inevitably discriminate against those trading partners outside the trade agreement (Hoekman, Martin and Primo Braga, 2009). Preferential access also implies that trade agreements can vary in strength depending upon the provided relative advantage. Some trade agreements may give great advantage because of high external tariffs, some others may have more muted effects because preferential treatment is granted to a large number of countries. The above discussion entails that the entry into force of a trade agreement affects not only the signing countries, but all other trading partners.[4]

The following two sections illustrate the steps to measure the effect of market access on trade flows. The first section illustrates two indices measuring market access conditions faced by exports. One index summarizes the tariffs faced by exports, another index measures the preferential margin at the bilateral level. The second section lays down the estimating framework utilized in assessing the contribution of the two indices to explain bilateral trade flows.

2.1 Market Access

To measure market access conditions we provide two trade policy variables: the first measure captures *direct* market access conditions (the overall tariff faced by exports), the second measure captures *relative* market access conditions (the overall tariff faced by exports relative to that faced by competitors). Both measures are calculated at the bilateral level.

[4] This relates to preferential erosion: existing trade agreement generally lose force when new trade agreements are put into effect.

The variable capturing the tariff restrictiveness faced by exports is an index based on the work of Kee, Nicita and Olarreaga (2009). In the construction of this index, the aggregation across products takes into account the fact that imports of some goods can be more responsive than others to change in prices. In aggregating across tariff lines, products where imports are less sensitive to prices (inelastic) should be given less weight because preferential access (a lower tariff) would have less effect on the overall volumes of trade. We call this variable the tariff the trade restrictiveness index (TTRI). In formal terms, the TTRI faced by country *j* in exporting to country *k* is:

$$TTRI_{jk} = \frac{\sum_{hs} exp_{jk,hs}\, \varepsilon_{k,hs} T^{j}_{k,hs}}{\sum_{hs} exp_{jk,hs}\, \varepsilon_{k,hs}} \qquad (1)$$

where, *exp* are exports, ε is the import demand elasticity, T is the applied tariff, *hs* are HS 6 digit categories.[5] In practice, this index provides the equivalent uniform tariff that will maintain exports from country *j* to country *k* constant.[6]

The variable capturing the stance of the system of preferences relative to competitors is provided by another index measuring the preferential margin. The commonly used measure of preference margins is simply the difference between the preferential tariff and the MFN rate. As in most instances other countries will also have some form of preferential access, this measure generally overestimates the actual preferential margin. In practice, it is possible that preferential rates granted to a particular country, although lower than MFN, still penalize it relative to other countries that benefit from an even lower or zero tariffs. The above discussion implies that the

[5] As cross country comparison of trade flows is only possible at the 6 digits level of the harmonized system classification (HS), this indicator is constructed on the basis of the 6 digits (HS).
[6] See Feenstra (1995).

advantage, in terms of tariff, of a FTA depends on the pre-existing structure of preferences.

To measure the effect of the advantage provided by the preferential tariff relative to that faced by other competitors, this paper builds on the approach of Hoekman and Nicita, 2008; Carrère, de Melo and Tumurchudur, 2008; and Low, Piermartini and Richtering, 2009. These studies recognize that a better measure of the preferential margin is one that takes into account the preferences accorded to third party countries. In this regard, the strength of the preferential trade agreement is measured by the "relative" preferential margin as it is relative to any preferential access provided to other competitors. In this study the relative preferential margin that a country grants to a given country is calculated as the difference - in tariff percentage points - that a determined basket of goods faces when imported from the given country relative to being imported from any other.[7]

There are two set of weights when calculating such a preferential margin. First, the counterfactual is a weighted average of the tariff imposed on all other partners. Second, the overall tariff (and the preferential margin) is an average constructed across many tariff lines. To calculate the counterfactual, the first step is to calculate the trade weighted average tariff at the tariff line level that one country (i.e. the USA) imposes on all other countries except the country for which the preferential margin is calculated (i.e. Mexico). This is done by using (USA) bilateral imports as weights, so as to take into account the supply capacity of (USA) trading partners. The second step is to aggregate across tariff lines. This is done by using (Mexico) exports (to USA) so as to take into

[7] To clarify with an example, in a proper measure of the preferential market access that Mexico enjoys in the USA, the counterfactual is the average tariff for Mexico's export (to the USA) bundle if this were to originate in other countries. The relative preferential margin is the difference between the counterfactual and the bilateral trade-weighted preferential tariff imposed by the USA on Mexico.

consideration the different product composition across partners. As in the TTRI case, a further complication arises in the aggregation across products.[8] To correct for this, in the calculation of the RPM, the HS six digit product lines are aggregated using import demand elasticites.

In more formal terms, the relative preferential margin (RPM) measuring the advantage that exports of country *j* have in exporting its goods to country *k* can be calculated as:

$$RPM_{jk} = \frac{\sum_{hs} \exp_{jk,hs} \varepsilon_{k,hs} (T^{w}_{k,hs} - T^{j}_{k,hs})}{\sum_{hs} \exp_{jk,hs} \varepsilon_{k,hs}}, j \neq k \text{ , with } T^{w}_{k,hs} = \frac{\sum_{v} exp_{vk,hs} T^{v}_{k,hs}}{\sum_{v} exp_{vk,hs}} \quad (2)$$

where *exp* are exports, ε is the import demand elasticity, T is the tariff, *hs* are HS 6 digit categories, and *v* are exporters competing with country *j* in exporting to country *k*. And where $T^{w}_{k,hs}$, is the average HS 6 digit (trade weighed) tariff applied by country *k* to imports originating from each country *v*. Note that any measure of preference margin could be positive or negative, depending on the advantage or disadvantage of the country with respect to other competing exporters. In summary, the RPM provides a measure of the tariff advantage (or disadvantage) provided to the actual exports of country *j* in country k, given the existing structure of tariff preferences.[9]

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[8] When aggregating across product lines, the overall relative preferential margin should be higher if the exporting country has a higher preferential margin in products for which demand is more elastic to small movement in prices.

[9] A substantial advantage of this policy variable is that it also captures the strength of preferential access, something that the use of dummy variables cannot control for. For example, some trade agreements may give great advantage because of a high external tariff, some others may have more muted effects because of a low external tariff or because preferential treatment is granted to a large number of countries. The drawback is that, by focusing only on tariffs, the analysis does not assess the impact of any additional advantage that PTAs can carry. However, non tariff elements of PTAs are often defined by cross sectional features. Their impact would then be captured by country-pairs and country-and-time fixed effects.

2.2 Estimating the effect of preferences on trade flows

The standard approach to measure the impact of policy variables on trade flows is the gravity model. This model relates bilateral trade to economic sizes and transport and transaction costs controlling for variables such as common language, shared border, etc.[10] The effect of a specific trade policy is often estimated by including dummy variables for the presence of policy factors affecting trade such as trade agreements. Although the econometric estimation of this paper follows that of the recent literature on gravity models, the approach in identifying the effect of trade liberalization is different. The difference is in the fact that analysis is not based on discrete events (i.e. the effects resulting from the implementation of a PTA) but examines market access conditions in terms of tariff changes, whether they are caused by PTAs or not.[11] In this set-up, we expect the impact of PTAs on trade due to any other trade agreement related factor to be absorbed to a large extent by the inclusion of importer and exporter time specific dummies as well as country-pair fixed effects.

In summary, the estimating framework consists of a panel gravity model where a set of fixed effects address heterogeneity, multilateral resistance, and control for all the determinants of trade flows normally included in gravity model specifications. To capture the effect of change in preferential access, the estimation includes the two trade policy variables discussed above: the TTRI which captures the absolute stance of the bilateral tariff between two countries, and the RPM which captures the stance of the bilateral tariff relative to all the other partners. By including the RPM in the estimation

[10] Linder 1961; Linnemann 1966; Anderson and van Wincoop 2003.

[11] Due to lack of comprehensive data we do not take into account the issue related to the utilization rates of trade preferences. Thus we assume that all trade is subjected to the lowest available tariff.

we examine whether the effect of the change in tariff is stronger the greater the advantage it provides relative to other competitors. In practice, one should expect a negative sign for the TTRI coefficient, as a higher tariff would obstacle trade, and a positive sign for the RPM coefficient, as a relatively higher preferential margin would provide the country with an advantage. Note also that this specification provides the estimates necessary to measure the strength of trade agreements on different countries, including third parties.

An issue related to the estimation of the gravity model is that the inclusion of gravity type variables alone does not take into account all the factors impeding bilateral trade flows. Well-specified gravity models consider not only frictions between pairs of countries, but also frictions relative to the rest of the world. In particular, one needs to control for the presence of unobserved relative trade impediments that a country has with all its trading partners (Anderson and van Wincoop, 2003). That is, bilateral trade depends not only on bilateral trade costs but also on the average trade costs faced (or imposed) by these countries. Multilateral resistance can be controlled for by adding multilateral price terms or more commonly with country fixed effects. In our case, multilateral price terms are likely to be time varying and therefore it is necessary to estimate the model by using country-time fixed effects. Moreover, in our setting country-time fixed effects would also capture any importer (and exporter) specific effects of the tariff regime. As the RPM provides the relative advantage not with respect to the average, but to each trading partner, it also captures the discriminatory effects of the system of preferences.

Trade models dealing with policy variables often suffer from a problem of endogeneity. That is, countries select to enter trade agreements (and thus reduce the tariffs) with partners where trade flows are larger. In cross-section models such

endogeneity is generally treated with the use of instrumental variables. However, instrumental variable estimation may not be fully satisfactory for treating policy variables because the endogeneity bias may be due to unobserved time-invariant heterogeneity (Baier and Bergstrand, 2004). In a panel setting, such endogeneity bias is treated by adding country-pair fixed effects (Baier and Bergstrand, 2007). Besides controlling for gravity type variables such as distance and shared border, country-pair fixed effects control for any unobserved variable simultaneously affecting the change in the tariff and the level of trade.

In summary, the estimation of the effect on trade from changes in market access conditions is based on a gravity model according to the following specification:

$$\ln X_{jkt} = \beta_0 + \beta_1 \ln(1 + TTRI_{jkt}) + \beta_2 RPM_{jkt} + \omega_{jt} + \psi_{kt} + \theta_{kj} + \varepsilon_{jkt} \qquad (3)$$

where the subscripts *j* denotes exporters, *k* denotes importers and *t* denotes year; and where X is the value of trade from country *j* to country *k*, $TTRI$ is the tariff trade restrictiveness index as in equation (1), *RPM* is the real preferential margin as in equation (2); ω_{jt} is importer-time fixed effects, ψ_{kt} is exporter-time fixed effects, θ_{kj} is importer-exporter pair fixed effects and ε_{jkt} is an i.i.d term with mean zero and variance λ.[12]

2.3 The RPM and the theoretically based gravity model.

[12] Note also that country-pair dummies also soak up any variance due to the presence of time invariant preferential trade agreements. Thus our coefficients capture the effect of the change in tariffs, also controlling for implementation periods.

The empirical framework discussed above can be reconciled with the theoretically based gravity model as follows. In the standard Dixit-Stiglitz-Krugman set-up, country-*k*' s imports from country j is given by:

$$X_{jk} = \tau_{jk}^{1-\sigma}\left(\frac{Y_j E_k}{\Omega_j P_k^{1-\sigma}}\right) \tag{4}$$

where τ_{jk} reflects all trade costs including tariffs, Y_j is nation-*i*'s output, E_k is the destination nation expenditure on tradable goods, σ is the elasticity of substitution (σ>1) among all varieties from all nations (varieties are usually assumed to be symmetric for simplicity), P_k is nation-*k*'s ideal CES price index (all goods are assumed to be traded) and, Ω_j measures the real market potential of nation-*j*' s exports.[13]

Trade costs can be redefined as $\tau_{jk} = t_{jk} f_{jk}$ where t_{jk} is the tariff component of trade costs and f_{jk} incorporate other trade costs such as freight costs, the latter being mostly a function of geographical features. This definition of trade costs makes the price index prevailing in the destination country an explicit function of tariffs applied to varieties coming from different exporting countries. The properties of the price index do not allow separating tariffs from other components of the various landed price. This means that it is not possible to derive the RPM index from the standard Dixit-Stiglitz-Krugman approach and, or from any approach using a CES utility function as

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[13] P_k and Ω_j are given respectively by $P_k = \sum_{i=1}^{N}\left(n_i (p_{ik})^{1-\sigma}\right)^{\frac{1}{1-\sigma}}$ and $\Omega_j = \sum_{i=1}^{N}\left(\tau_{ji}^{1-\sigma}\frac{E_i}{P_i^{1-\sigma}}\right)$, where p_{ik} is the landed in nation *k* of goods produced in nation *i* and n_i is the number of varieties exported from nation *i*. The landed price is made of the producer price in the country of origin augmented by trade costs which are destination specific and takes the standard iceberg form.

representative of consumers' preferences. However, the scope of the paper is not to offer an alternative theoretical modeling strategy. In order to reconcile our measure with standard theory we simply include it in equation (4) and assess the consequences in terms of empirical strategy. By adding both to the numerator and the denominator the two components of the RPM index (the tariff applied to competitors and the tariff applied to country *j*) , equation (4) becomes:

$$X_{jk} = f_{jk}^{1-\sigma} t_{jk}^{2-\sigma} \frac{t_{wk}}{t_{jk}} \left(\frac{Y_j E_k}{\Omega_j P_k^{1-\sigma} t_{wk}} \right) \qquad (4')$$

where t_{wk} is the average tariff faced by all exporters to country *k* other than those from country *j*.[14] Then, using standard proxies and measures defined in the previous section, equation (4') can be rewritten as

$$X_{jk} = f_{jk}^{1-\sigma} (1+TTRI_{jk})^{2-\sigma} \left(\frac{1+T_{jk}^{w}}{1+TTRI_{jk}} \right) \left(\Omega_j P_k^{1-\sigma} \right)^{-1} \left(\frac{GDP_j GDP_k}{1+T_{jk}^{w}} \right) \qquad (4'')$$

where $T_{jk}^{w} = \dfrac{\sum_{hs} \exp_{jk,hs} \varepsilon_{k,hs} (T_{k,hs}^{w})}{\sum_{hs} \exp_{jk,hs} \varepsilon_{k,hs}}, j \neq k$

Note that the measure of average tariff (T_{jk}^{w}) does not reflect the tariff component of the Anderson and Van Wincoop resistance term unless exports to country *k* from any trade partner all share the same composition in terms of products exported. Hence T_{jk}^{w}

[14] This average tariff is specific to the country of origin as it is computed using the number of varieties exported by country *j* to country *k* and not all varieties imported by *j*. This makes it different from the tariff component of price index prevailing in *k*. In this context, only the number of varieties matters not the variety itself as they are all charged the same producer price within the same country.

should not be absorbed by the importer and time fixed effects and as a consequence should be treated explicitly.

In the standard estimation approach bilateral exports are weighted by the product of GDPs. In our context this would mean treating the $(1+T_{jk}^{w})$ variable independently. As this may bring some additional statistical issues due to the possible correlation of the latter term with $(1+TTRI_{jk})$ this suggests another implementation strategy. Instead of imposing a unity coefficient on the product of GDPs as done with the standard weighting procedure, we keep the product on the right hand side and normalize it by $(1+T_{jk}^{w})$.

The empirical specification corresponding to (4') that we consider for estimation is thus given by:

$$\ln X_{jkt} = \beta_0 + \beta_1 \ln(1+TTRI_{jkt}) + \beta_2 \ln\left(\frac{1+T_{jkt}^{w}}{1+TTRI_{jkt}}\right) + \beta_3 \ln\left(\frac{GDP_j GDP_k}{1+T_{jkt}^{w}}\right) + \omega_{kt} + \psi_{jt} + \theta_{kj} + \varepsilon_{jkt} \quad (5)$$

where the notation is as before. Specification (5) provides a theoretically based robustness for assessing the impact of trade preferences on exports. In practice, we do not expect considerably different results in estimating equation (5) versus equation (3).

3. Data

The data utilized in this paper is comprehensive of trade flows and tariffs. Trade data originates from the UN COMTRADE database; tariff data (MFN and preferential rates) originates from the UNCTAD TRAINS database. Trade and Tariff data is

available through the World Integrated Trade Solutions (WITS).[15] Import demand elasticities are from Kee, Nicita and Olarreaga (2008); GDP data is from the World Bank World Development Indicators database. Tariff, trade, and import demand elasticities data follows the Harmonized system at the 6 digit level. The underlining data to compute the bilateral TTRI and the relative preferential margin covers about 5000 different products for 85 countries, over 8 years (2000-2007).[16] One contribution of this paper is also the provision of a dataset on the bilateral TTRI and RPM indices for each year of the analysis. This data is available from the authors on request.

4. Results.

This section first illustrates some descriptive statistics on the policy variables, and then it discusses the estimation results from the gravity model. Finally, it summarizes the impact of trade policy variables on bilateral trade.

4.1 Tariffs Trade Restrictiveness and Relative Preferences

The first step of the analysis is to calculate the two policy variables measuring the market access conditions that each country faces in exporting its products. The TTRI measures the tariff restrictiveness that exports of a given country face in a determined market. The larger the give country's TTRI the higher is the tariff restrictiveness faced by the country's exports. The RPM indices provide the average tariff advantage (or disadvantage) that the country has in exporting to each trading partner relative to other

[15] WITS preferential data is not always complete for the earlier years of the analysis. We further validate the data on tariff preferences by using some of the databases available online (McGill Faculty of Law Preferential Trade Agreements Database, the Tuck Trade Agreements Database and the WTO Regional Trade Agreements Database).

[16] Lack of reliable time series data on preferential tariff precludes the inclusion of a number of countries in our sample. Still, the sample includes all major countries and covers more than 90 percent of world trade. Table 1 provides the list of the countries covered by the data.

competitors. A negative value of the RPM measure implies that the country's exports, on average, are relatively disadvantaged vis-à-vis its competitors. The TTRI and the RPM indices are calculated at the bilateral level for every year of the analysis. Some descriptive statistics for the first year (2000) and last year (2007) of the data are provided in Table 1 and Figure 1.

Tariff restrictiveness varies considerably across countries. The variation is due to both product composition and preferential access. Countries whose exports are largely concentrated on energy, minerals and raw materials are those facing a lower TTRI. Similarly, countries part of free trade areas, generally face a lower TTRI. On the other hand, countries whose major exports are agricultural products or countries that are not part of preferential trade agreements tend to have a larger TTRI. In value terms, average export restrictiveness is not large. The 2007 TTRI is less than 1 percent for about 34 countries of the sample and above 4 percent in only 9 countries. Due to the widespread tariff liberalization during the period of analysis, the TTRI has declined consistently between 2000 and 2007. The simple average TTRI across the countries in our sample has declined from about 3.5 percent in 2000 to about 2 percent in 2007. This decline is also reflected in Figure 1, which reports the distribution of the simple and import weighed average bilateral TTRI. The import weighed bilateral TTRI is generally much lower than the simple bilateral TTRI, suggesting that trade is concentrated where tariff restrictions are lower.

Regarding the RPM, for 2007 it varies from about minus 1 percent for Japan, China, Korea and India, to about plus 3 percent or more for El Salvador, Guatemala, Honduras, Kenya, Mauritius and Nicaragua. These are the countries which enjoy the highest relative advantage in their export basket vis-à-vis other competitors. In general, low income countries benefit most from the existing structure of preferences as a

substantial number of them benefits from preferential access to the US and EU markets. On the other hand, high income countries, and countries with limited participation in trade agreements, are found to be those with a negative RPM. As of 2007, the existing structure of preferences discriminates against imports from about 13 countries (negative RPM). These countries face a tariff on their exports higher than that of their competitors. The variance of the bilateral RPM depends both on export composition and on the number and strength of existing PTAs. Bolivia, Kenya, Colombia, and Bangladesh are the countries with the highest dispersion.

The RPM has increased for the majority of countries. The simple average across our sample of 86 countries indicates that the RPM has increased from -0.2 percent in 2000 to about 0.7 percent in 2007. This increase is largely due to the proliferation of PTAs, which has produced an increase the number of trade relationships with a positive RPM. This point is more evident in Figure 1, which indicates that while the simple mean of bilateral RPM has increased, the weighted mean has decreased during our period of analysis.[17] The proliferation of PTAs has also reduced the relative tariff advantage of pre-existing PTAs. Countries that enjoyed preferential access before the year 2000 find their preferential margin eroded by any new PTA involving their trading partners. In practice, the structure of relative preferences has moved from a situation where few bilateral trade relationships enjoyed relatively large preferential access, to a situation where there is a higher number of positive (but smaller) relative preferential access trade relationships. In particular, most of the countries where RPM has decreased are found to be high income countries. As high income countries have been early adopters of PTAs, their preferential advantage has been eroded by the proliferation of

[17] Simple average RPM is generally negative, as the majority of bilateral trade relationships are not subject to any preferential agreements.

PTAs during 2000-2007. In addition, relative preferences have declined for countries that did not actively engage in bilateral agreements, such as China and India.

In the majority of cases, improvement in direct market access is accompanied by better relative market access conditions and vice-versa. Figure 2 illustrates the correlation between changes in bilateral RPM and TTRI between 2000 and 2007. Still, there are a number of cases (24.5%) where a reduction in the tariff is not accompanied by an amelioration of relative market access. That is, some of the advantage provided by the improvement in direct market access conditions is lost by the reduction in the relative preferential margin. Similarly, in a limited number of cases (8.4 percent) some of the amelioration of relative market access conditions is offset by an increase in trade restrictiveness.

4.2. Econometric Results

Estimates from the gravity model indicate that TTRI and RPM have a significant effect on trade flows. This implies that the magnitude of trade flows depends not only on the tariffs faced, but also on the relative advantage provided by the structure of preferences. That is, bilateral trade flows are found to be larger the greater the relative advantage provided by the system of preferences.

Before discussing the results in detail, some interpretation of the two coefficients of interest is in order. The TTRI and the RPM index are trade weighted measures, implying that their magnitude could change even in cases when tariffs are kept fixed.[18] For example, the TTRI would decline when a country's export basket shifts towards goods facing lower tariffs. Similarly, RPM will increase when exports shift towards

[18] Note that this issue would not raise problems of reverse causality as TTRI and RPM are aggregated across products.

goods which enjoy a larger relative advantage. In an extreme case, assuming that tariffs are kept fixed (thus changes in TTRI and RPM are just driven by shift in exports), a positive coefficient on the TTRI would imply that exports are shifting towards goods facing lower tariffs. Arguably, one interpretation could be that the country is reacting to previous changes in trade policy by taking better advantage of pre-existing favorable market access conditions. In this regard, our estimated coefficients capture the effect of actual and previous tariff changes on trade flows.[19] In this regard, to examine whether the changes of TTRI and RPM are related to export composition or a change in tariff we calculate the TTRI and RPM with time-unvarying weights.[20] The original TTRI and RPM resulted highly correlated (>0.9) with time-unvarying TTRI and RPM, indicating that that most of the changes in the TTRI and RPM are driven by changes in tariffs rather than adjustments in the export basket. Moreover, estimating the gravity model using TTRI and RPM constructed with time-unvarying weights produced very similar results.

4.2.1. Core Specifications

Table 2 reports the estimated coefficients for a series of specifications of the gravity model. Columns (1) and (2) report results obtained with a naïve gravity specification. All coefficients are in line with standard predictions. Specifications reported in columns (3) to (7) include country-pair fixed effects and thus time invariant variables are dropped. In all of these specifications the coefficients of interest result significant and of the correct sign. More in detail, column (3) estimated coefficient according to the simple specification without the RPM term. In this specification, the coefficient on the TTRI variable of -0.679 implies that bilateral trade flows are estimated to decrease by 0.72 percent for one percentage point increase in the TTRI at its mean.

[19] In this paper we do not aim to disentangle these effects, we leave this to future research.
[20] Weights are given by average export over time at the product level.

Specification (4) adds the RPM variables. The RPM coefficient indicates that for each 1 percentage point of increase in the RPM, bilateral trade is expected to increase by about 0.34 percent. The coefficient on the TTRI is not substantially affected by including the RPM variable.[21] A decrease of one percentage point in the TTRI at its mean value increases trade by about 0.61 percent. Without country-time fixed effects (*jt* and *kt*), that is ignoring the time-varying multilateral price terms, the coefficient of both TTRI and RPM increases significantly in absolute value indicating clearly the incidence of an omitted-variable bias. Specification (5) is similar to (4) but scale the dependent variable by the product of trade partner's GDPs as suggested by standard theoretical derivation. Imposing unitary income elasticities restrictions does not influence the coefficients on the two variables of interest.

We also estimate the gravity model in first-differences. This provides an alternative approach in order to account for a possible endogeneity bias due to an omitted variable bias and time-invariant unobserved heterogeneity. Specifications (6) and (7) correspond to (4) and (5) respectively. In formal terms the estimated models become:

$$\Delta \ln X_{jkt-(t-1)} = \beta_4 \Delta \ln(1+TTRI_{jk})_{t-(t-1)} + \beta_5 \Delta RPM_{jkt-(t-1)} + \omega_{jt-(t-1)} + \psi_{kt-(t-1)} + \varepsilon_{jkt-(t-1)} \quad (6)$$

Subscripts are as usual and, Δ is the difference operator. Although the coefficients indicate a smaller effect of the TTRI and a larger effect of the RPM indices, they maintain their significance and sign.

4.2.2. Robustness Checks

[21] For robustness we also estimated all specifications using the two policy variables RPM and TTRI computed without import demand elasticities. Coefficients keep their significance and are similar in magnitude.

Table 3 reports the estimated coefficient for a series of robustness-check specifications. Estimation of equation (5) is shown in column (8). Signs and significance of parameters of interest are maintained. However, the interpretation of the RPM-ratio coefficient in terms of trade effects is not straightforward. Assuming that changes in the RPM-ratio are due to changes in the TTRI, a one percentage point decrease in the TTRI taken at its mean value translates into a 0.63 percent change in bilateral trade via the RPM-ratio impact. As far as the direct impact of TTRI is concerned the corresponding figure is 0.65 percent, again computed at the mean value of TTRI and assuming that only TTRI varies. The trade weighted version of (8) is presented in column (9). As in the core specification, results are not significantly affected. Columns (10) and (11) report results obtained by estimating equation (5) in first differences. Significance and signs are maintained although the coefficients indicate a smaller effect of the TTRI and a larger effect of the RPM indices. Overall specifications with *ln(*RPM-ratio*)* generate comparable results in terms of sign and significance of the coefficients of interest and in terms of goodness of fit.

Finally, columns (8') and (10') refer to specifications where $\ln\left(\frac{1+T^{w}_{jkt}}{1+TTRI_{jkt}}\right)$ has been approximated by $\left(T^{w}_{jkt} - TTRI_{jkt}\right)$. The approximation is satisfactory for small values of both T^{w}_{jkt} and $TTRI_{jkt}$. Equation (5) can then be rewritten as,

$$\ln X_{jkt} = \beta_0 + \beta_1 \ln(1+TTRI_{jkt}) + \beta_2 RPM_{jkt} + \beta_3 \ln\left(\frac{GDP_j GDP_k}{1+T^{w}_{jkt}}\right) + \omega_{kt} + \psi_{jt} + \theta_{kj} + \varepsilon_{jkt} \quad (5')$$

A direct comparison can be made with results obtained in columns (4) and (6) of Table 2. As coefficients keep the same sign and significance level and vary only marginally in absolute value, the inclusion of our theoretically predicted control variable does not entail the validity of core results.

As a further test we are interested whether the RPM variable of equation (2) provides a better fit in explaining bilateral trade than the standard measure of preferential margin (that is, not considering preferential access granted to third countries' exporters but only the MFN rate).[22] Results are reported in Table 4, where the specifications reflect those of Table 2. All coefficients for the preferences margin measure lose their significance. The coefficients on the TTRI are substantially equal to those obtained by using the RPM index. The lack of significance may reflect two things. First it may reflect a lower degree of variation across country-time of the standard preferential margin. But it may also reflect the fact that PM is much less bilateral that TTRI, and its impact is likely to be absorbed by country-and-time dummies. In both cases, if the PM variable had to be affecting bilateral trade significantly this effect would appear with the removal of country-and-time dummies. Results obtained for the non-weighted specification in levels are reported in column (11). The estimated coefficient increases in absolute value but remains not significant at any reasonable level. Similar remarks apply to results obtained with other core specifications. As a consequence the issue may not be only statistical. From an economic point of view the latter result could indicate that the commonly used measure of preferential margin does not properly reflect the advantage provided by the system of preferences.

A recurring problem with gravity estimation is the presence of zero trade. As the gravity model is generally estimated in a log-normal specification, it will discard observations where there is no trade. Recent procedures to take into account zero trade flows are the Poisson estimation (da Silva and Tenreyo, 2006), or a two-stage estimation procedure (Helpman, Melitz and Rubinstein, 2008). Our preferred specification does not

[22] The preferential margin is given by $PM_{jk} = \frac{\sum_{hs} exp^{j}_{k,hs}\ \varepsilon_{k,hs}\left(MFN_{k,hs} - T^{j}_{k,hs}\right)}{\sum_{hs} exp^{j}_{k,hs}\ \varepsilon_{k,hs}}$

control for the presence of zeros for a number of reasons. First, the incidence of zero trade observations remains relatively limited in our sample. All considered, the matrix of bilateral trade has about 14 percent of zero-trade observations. Second, in our sample inexistent bilateral trade is generally confined to cases of small and distant countries (Frankel, 1997) or between countries lacking cultural and historical links (Rauch, 1999). In our specification these are captured by country-pair fixed effects.[23] Most importantly, our main variables of interest, the RPM indices and TTRI, utilize trade values (at the product level) as weight. Thus, these variables cannot be properly computed when bilateral trade is zero.

4.3. Impact of preferential access on trade flows

In this section we estimate the effect of the system of preferences on trade flows. As mentioned above, results are based on the coefficients obtained in specification (4). Nevertheless, similar qualitative conclusions but also similar quantitative conclusions would be reached using coefficients obtained in specification (8). The impact on exports for every country is calculated as:

$$\Delta ln\left(exp_j\right) = \sum_k \beta_1 \Delta ln\left(1 + TTRI_{jk}\right) + \beta_2 \Delta RPM_{jk} \qquad (6)$$

We report two sets of results. The first set of results is based on changes in the differences between the first to the last year of the analysis. This provides the estimated percentage change in trade (since 2000) due to the change in market access conditions between 2000 and 2007. In a second set of results, equation (6) is calculated relative to a

[23] The country-pair composition of zero trade varies only marginally from year to year. The contribution of the new bilateral trade flows to the variation in total trade is on average equal to 0.2 percent.

hypothetical no-preference scenario where all bilateral flows are subjected to MFN rates.[24]

Results for the effect of the change in market access conditions on bilateral trade are provided in Table 4. For the average country, trade gains from the current system of preferences are estimated to be about 1.6 percent with respect to market access conditions in 2000, and about 2.3 percent with respect to a hypothetical scenario based on the prevailing 2007 MFN rate. In both cases, most of the effects originated from an amelioration in direct market access conditions. Improvements in relative market access conditions are of less importance and account for about 0.3 percent increase in trade. The reasons behind those small average effects are that tariff liberalization has only marginally affected the larger trade flows (these among high-income countries) and that the already low MFN tariff on many important products (about 40 percent of world trade is free under MFN tariffs).

Although the results are on average small, they show substantial variance. Changes in market access conditions between 2000 and 2007 have produced an increase in trade of 5 percent or more for about six countries (El Salvador, Honduras, Mauritius, Guatemala, Nicaragua and Iceland). On the other hand, due to the deterioration in relative market access conditions, about 11 countries have seen their trade negatively affected by changes in market access conditions between 2000 and 2007. Exports from these countries have lost competitiveness to countries benefiting from a better preferential access. In general, the countries where gains have been larger are those which were the most active in implementing PTAs during the period of analysis. Countries that were already part of PTAs have gained less, as a portion of any gains from the overall trend in tariff reduction is somewhat offset by preference erosion (a

[24] That is: $\Delta ln(1+TTRI_{jk}) = ln(1+MFN_j) - ln(1+TTRI_{jk})$ and $\Delta RPM_{jk} = RPM_{jk}$

negative RPM). With regard to changes in the MFN scenario, the results are qualitatively similar. For the majority of countries cases improvement in direct market access matters most. However, for four countries (China, Korea, Japan and Taiwan) the change in relative market access conditions produces relatively larger negative impact. For those countries the existing system of preferences imposes a loss in competitiveness to the advantage of countries with improved preferential access.

5. Conclusions

The purpose of this paper is twofold. The first objective is to provide two indices of market access conditions that take into account the complex structure of tariff preferences. The second objective is to examine how changes in market access conditions impact international trade. In particular, we examine whether the effect of change in tariff is stronger the larger the advantage that preferential access provides relative to competitors.

In relation to the title of this paper, the overall results indicate that preferential market access is valuable in terms of export performance. Its value depends both on the direct advantage provided by preferential access as well as the advantage provided with respect to other competitors. In numbers, a decline of one percentage point in terms of the overall tariff faced by exports is reflected in an average increase by almost 0.7 percent in bilateral trade. Similarly, for every percentage point increase in relative market access trade increases by slightly more than 0.3 percent.

Although preferential access matters, its effect on trade is not large on average. The reason is that changes both in direct and relative preferential access, as measured by the two indices, are often small. Given the already low MFN tariffs (about 40 percent of world trade is free under MFN tariffs) and the large number of PTAs, the

improvement in preferential access is often marginal in terms of tariff advantages, and consequently has marginal effects on trade. Still, looking beyond averages, the results show a large variance. This indicates that for some countries changes in market access conditions have produced substantial effects on trade. More importantly, we do not investigate changes at the product level where improvements in market access conditions are likely to produce much larger effects.

Regarding the two indices of market access conditions, the results indicate that overall tariff restrictiveness is on average not large and has constantly declined during the period of analysis. For the average country, tariff restrictiveness imposed on its exports has declined from 3.5 percent in 2000 to 2 percent in 2007. Similarly, the relative preferential margin is also small in most cases. The simple average across a sample of 86 countries indicates that RPM has increased from -0.2 percent in 2000 to about 0.7 percent in 2007. This increase can be explained by the fact that the structure of preferences moved from a situation where few bilateral trade relationships benefited from relatively large preferential access to a situation with a higher number of bilateral trade relationships benefited from smaller relative preferential access. While the proliferation of PTAs has had the effect of increasing the number of bilateral trade relationships with a positive RPM, this proliferation has also eroded some of the tariff advantage of pre-existing PTAs.

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Table 1 - Indices of Direct and Relative Market Access Conditions, by Country

		Absolute Market Access				Relative Market Access			
Country Name	Code	TTRI 2000	St. dev.	TTRI 2007	St. dev.	RPM 2000	St. dev.	RPM 2007	St. dev.
Algeria	DZA	0.006	(0.018)	0.022	(0.028)	-0.001	(0.009)	-0.001	(0.003)
Argentina	ARG	0.071	(0.094)	0.034	(0.056)	0.000	(0.062)	0.018	(0.039)
Australia	AUS	0.038	(0.034)	0.035	(0.028)	-0.001	(0.009)	-0.001	(0.007)
Austria	AUT	0.009	(0.023)	0.006	(0.019)	0.010	(0.009)	0.003	(0.003)
Azerbaijan	AZE	0.004	(0.014)	0.010	(0.023)	-0.001	(0.007)	0.000	(0.005)
Bangladesh	BGD	0.050	(0.051)	0.035	(0.055)	0.025	(0.045)	0.027	(0.040)
Belgium	BEL	0.031	(0.028)	0.009	(0.027)	-0.029	(0.019)	0.004	(0.004)
Benin	BEN	0.096	(0.097)	0.188	(0.150)	0.015	(0.103)	0.007	(0.038)
Bolivia	BOL	0.031	(0.032)	0.003	(0.010)	0.032	(0.035)	0.023	(0.059)
Brazil	BRA	0.046	(0.048)	0.037	(0.069)	-0.002	(0.025)	0.004	(0.029)
Bulgaria	BGR	0.028	(0.037)	0.015	(0.037)	-0.014	(0.016)	0.003	(0.013)
Cameroon	CMR	0.010	(0.024)	0.016	(0.049)	-0.002	(0.007)	0.004	(0.007)
Canada	CAN	0.007	(0.024)	0.006	(0.020)	0.010	(0.008)	0.006	(0.009)
Chile	CHL	0.022	(0.028)	0.009	(0.016)	0.005	(0.019)	0.006	(0.012)
China	CHN	0.032	(0.032)	0.035	(0.030)	-0.005	(0.011)	-0.011	(0.014)
Colombia	COL	0.046	(0.061)	0.007	(0.019)	-0.002	(0.012)	0.023	(0.042)
Costa Rica	CRI	0.034	(0.044)	0.007	(0.033)	-0.003	(0.012)	0.008	(0.016)
Cote D'Ivoire	CIV	0.049	(0.082)	0.029	(0.063)	-0.006	(0.011)	0.003	(0.011)
Croatia	HRV	0.018	(0.033)	0.008	(0.025)	-0.006	(0.014)	0.005	(0.007)
Czech Rep	CZE	0.022	(0.039)	0.004	(0.017)	-0.021	(0.019)	0.004	(0.003)
Denmark	DNK	0.016	(0.031)	0.009	(0.023)	0.006	(0.011)	0.002	(0.004)
Ecuador	ECU	0.078	(0.131)	0.021	(0.098)	0.003	(0.029)	0.014	(0.028)
Egypt	EGY	0.053	(0.052)	0.021	(0.032)	-0.008	(0.018)	0.007	(0.032)
El Salvador	SLV	0.094	(0.036)	0.005	(0.027)	-0.009	(0.005)	0.051	(0.031)
Estonia	EST	0.015	(0.017)	0.007	(0.019)	-0.004	(0.007)	0.002	(0.005)
Ethiopia	ETH	0.008	(0.028)	0.019	(0.104)	0.001	(0.009)	0.008	(0.015)
Finland	FIN	0.013	(0.028)	0.015	(0.027)	0.003	(0.008)	0.000	(0.004)
France	FRA	0.016	(0.036)	0.014	(0.029)	0.009	(0.011)	0.004	(0.005)
Ghana	GHA	0.029	(0.057)	0.050	(0.084)	-0.007	(0.009)	0.002	(0.010)
Greece	GRC	0.020	(0.039)	0.010	(0.028)	0.017	(0.016)	0.004	(0.006)
Guatemala	GTM	0.069	(0.042)	0.007	(0.029)	-0.004	(0.008)	0.036	(0.027)
Germany	DEU	0.015	(0.034)	0.014	(0.032)	0.008	(0.015)	0.004	(0.006)
Honduras	HND	0.084	(0.045)	0.010	(0.054)	-0.008	(0.007)	0.043	(0.039)
Hong Kong	HKG	0.055	(0.046)	0.042	(0.034)	-0.012	(0.014)	-0.001	(0.024)
Hungary	HUN	0.023	(0.029)	0.005	(0.016)	-0.015	(0.012)	0.005	(0.004)
Iceland	ISL	0.076	(0.043)	0.016	(0.033)	-0.024	(0.021)	0.013	(0.017)
India	IND	0.042	(0.034)	0.039	(0.030)	-0.004	(0.011)	-0.011	(0.015)
Indonesia	IDN	0.086	(0.185)	0.034	(0.053)	-0.003	(0.014)	0.001	(0.013)
Ireland	IRL	0.010	(0.026)	0.005	(0.014)	0.007	(0.007)	0.002	(0.003)
Israel	ISR	0.019	(0.029)	0.011	(0.021)	-0.002	(0.011)	0.001	(0.005)
Italy	ITA	0.022	(0.037)	0.014	(0.028)	0.008	(0.014)	0.004	(0.006)
Japan	JPN	0.036	(0.035)	0.042	(0.033)	-0.010	(0.013)	-0.012	(0.014)
Jordan	JOR	0.073	(0.081)	0.059	(0.047)	-0.012	(0.035)	0.022	(0.022)
Kazakhstan	KAZ	0.010	(0.021)	0.007	(0.012)	-0.002	(0.007)	0.002	(0.008)

Table 1 (continued) - Indices of Direct and Relative Market Access Conditions, by Country

		Absolute Market Access				Relative Market Access			
Country Name	Code	TTRI 2000	St. dev.	TTRI 2007	St. dev.	RPM 2000	St. dev.	RPM 2007	St. dev.
Kenya	KEN	0.053	(0.069)	0.013	(0.040)	0.004	(0.042)	0.038	(0.053)
Korea Rep.	KOR	0.045	(0.042)	0.046	(0.031)	-0.011	(0.021)	-0.011	(0.016)
Latvia	LVA	0.013	(0.016)	0.006	(0.022)	-0.003	(0.012)	0.002	(0.007)
Lebanon	LBN	0.062	(0.075)	0.012	(0.031)	0.001	(0.021)	0.018	(0.032)
Lithuania	LTU	0.025	(0.031)	0.009	(0.025)	-0.008	(0.018)	0.003	(0.006)
Malaysia	MYS	0.020	(0.043)	0.021	(0.025)	0.000	(0.008)	0.002	(0.008)
Mauritius	MUS	0.069	(0.042)	0.006	(0.030)	-0.019	(0.015)	0.032	(0.038)
Mexico	MEX	0.008	(0.012)	0.004	(0.015)	0.015	(0.009)	0.011	(0.013)
Morocco	MAR	0.067	(0.032)	0.014	(0.031)	-0.020	(0.013)	0.011	(0.015)
Netherlands	NLD	0.011	(0.027)	0.008	(0.021)	0.011	(0.011)	0.003	(0.004)
New Zealand	NZL	0.065	(0.068)	0.048	(0.049)	-0.007	(0.016)	-0.007	(0.021)
Nicaragua	NIC	0.066	(0.048)	0.005	(0.016)	-0.005	(0.007)	0.039	(0.021)
Nigeria	NGA	0.008	(0.023)	0.008	(0.020)	-0.001	(0.008)	0.000	(0.009)
Norway	NOR	0.020	(0.014)	0.009	(0.021)	-0.009	(0.007)	0.000	(0.006)
Oman	OMN	0.007	(0.019)	0.013	(0.019)	0.000	(0.003)	-0.001	(0.006)
Peru	PER	0.035	(0.035)	0.007	(0.016)	-0.003	(0.019)	0.008	(0.015)
Philippines	PHL	0.025	(0.024)	0.015	(0.019)	-0.001	(0.008)	0.006	(0.025)
Poland	POL	0.021	(0.031)	0.006	(0.022)	-0.018	(0.012)	0.004	(0.004)
Portugal	PRT	0.009	(0.029)	0.010	(0.026)	0.022	(0.015)	0.007	(0.008)
Romania	ROM	0.023	(0.041)	0.008	(0.023)	-0.017	(0.023)	0.009	(0.008)
Russian Fed.	RUS	0.021	(0.023)	0.013	(0.017)	-0.003	(0.005)	-0.002	(0.005)
South Africa	ZAF	0.028	(0.037)	0.023	(0.034)	-0.003	(0.006)	-0.002	(0.008)
Saudi Arabia	SAU	0.018	(0.024)	0.022	(0.023)	0.000	(0.006)	0.000	(0.009)
Senegal	SEN	0.034	(0.065)	0.030	(0.066)	0.019	(0.019)	0.019	(0.037)
Singapore	SGP	0.020	(0.022)	0.016	(0.023)	0.000	(0.007)	0.003	(0.009)
Slovakia	SVK	0.013	(0.036)	0.005	(0.030)	0.009	(0.021)	0.008	(0.012)
Slovenia	SVN	0.022	(0.025)	0.005	(0.020)	-0.020	(0.015)	0.004	(0.003)
Spain	ESP	0.018	(0.047)	0.011	(0.027)	0.011	(0.019)	0.005	(0.006)
Sri Lanka	LKA	0.083	(0.044)	0.049	(0.055)	-0.010	(0.019)	0.006	(0.025)
Sweden	SWE	0.016	(0.033)	0.011	(0.024)	0.003	(0.015)	0.002	(0.004)
Taiwan	TWN	0.040	(0.036)	0.034	(0.024)	-0.006	(0.012)	-0.006	(0.009)
Tanzania	TZA	0.093	(0.202)	0.058	(0.111)	0.005	(0.040)	0.004	(0.012)
Thailand	THA	0.036	(0.040)	0.034	(0.038)	-0.001	(0.010)	0.004	(0.022)
Trinidad Tbg	TTO	0.008	(0.035)	0.003	(0.011)	-0.001	(0.012)	0.008	(0.007)
Tunisia	TUN	0.044	(0.026)	0.008	(0.029)	-0.016	(0.015)	0.016	(0.014)
Turkey	TUR	0.059	(0.049)	0.015	(0.035)	-0.029	(0.021)	0.009	(0.014)
Uganda	UGA	0.015	(0.085)	0.018	(0.087)	0.004	(0.025)	0.010	(0.026)
Un. Kingdom	GBR	0.018	(0.041)	0.015	(0.031)	0.004	(0.011)	0.002	(0.006)
Uruguay	URY	0.088	(0.060)	0.034	(0.049)	-0.002	(0.016)	0.010	(0.030)
USA	USA	0.023	(0.032)	0.026	(0.038)	0.019	(0.043)	0.005	(0.022)
Venezuela	VEN	0.032	(0.027)	0.002	(0.008)	-0.001	(0.006)	0.008	(0.012)
Zambia	ZMB	0.033	(0.080)	0.016	(0.028)	0.006	(0.023)	0.008	(0.012)
Simple Avg.		0.035	(0.044)	0.020	(0.035)	-0.002	(0.016)	0.007	(0.015)

Table 2 - Gravity Model Estimation.

Dependent variable: Natural log of export

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
RPM				0.339**	0.350**		
				(0.1601)	(0.1622)		
Ln (1+TTRI)		-2.348***	-0.679***	-0.609***	-0.618***		
		(0.1391)	(0.0912)	(0.0967)	(0.0975)		
Ln Distance	-0.961***	-0.934***					
	(0.0085)	(0.0087)					
Language	0.986***	1.007***					
	(0.0254)	(0.0253)					
Colonial Ties	0.201***	0.183***					
	(0.0383)	(0.0380)					
Border	0.791***	0.818***					
	(0.0433)	(0.0430)					
Ln GDP *j*	0.992***	0.978***					
	(0.0043)	(0.0044)					
Ln GDP *k*	1.194***	1.196***					
	(0.0042)	(0.0042)					
Diff_RPM						0.630**	0.644***
						(0.2471)	(0.2493)
Diff_TTRI						-0.478**	-0.472**
						(0.2022)	(0.2032)
Importer-year	No	No	Yes	Yes	Yes	Yes	Yes
Exporter-year	No	No	Yes	Yes	Yes	Yes	Yes
Country-pair	No	No	Yes	Yes	Yes	Yes	Yes
Weighted	No	No	No	No	Yes	No	Yes
Observations	50031	50031	50031	50031	50031	50031	50031
Adjusted R^2	0.716	0.718	0.956	0.956	0.885	0.087	0.085
Within R^2	-	-	0.303	0.303	0.303	0.303	0.303

Robust standard errors in parentheses (* p < 0.1, ** p < 0.05, *** p < 0.01)

Table 3- Gravity Model Estimation: Robustness checks

Dependent variable: Natural log of export

	(8)	(9)	(10)	(11)	(8')	(10')
RPM					0.361***	
					(0.1232)	
Ln(RPMratio)	0.598***	0.581***				
	(0.2022)	(0.2003)				
Ln (1+TTRI)	-0.555***	-0.598***			-0.581***	
	(0.1032)	(0.0970)			(0.1042)	
Ln GDPprod	0.0337				0.0282	
	(0.0371)				(0.0371)	
Diff_RPM						0.657***
						(0.2494)
Diff_lnRPMratio			0.964***	0.944***		
			(0.3033)	(0.3021)		
Diff_TTRI			-0.425**	-0.458**		-0.443**
			(0.2027)	(0.2021)		(0.2051)
Diff_lnGDPprod			0.0386			0.0349
			(0.0358)			(0.0358)
Importer-year	Yes	Yes	Yes	Yes	Yes	Yes
Exporter-year	Yes	Yes	Yes	Yes	Yes	Yes
Country-pair	Yes	Yes	-	-	Yes	-
Weighted	No	Yes	No	Yes	No	No
Observations	50031	50031	42140	42140	50031	42140
Adjusted R^2	0.956	0.885	0.087	0.085	0.956	0.087
Within R^2	0.303	0.308	-	-	0.303	-

Robust standard errors in parentheses (* p < 0.1, ** p < 0.05, *** p < 0.01)

Figure 1 - Distribution of Direct (TTRI) and Relative (RPM) Market Access Indices

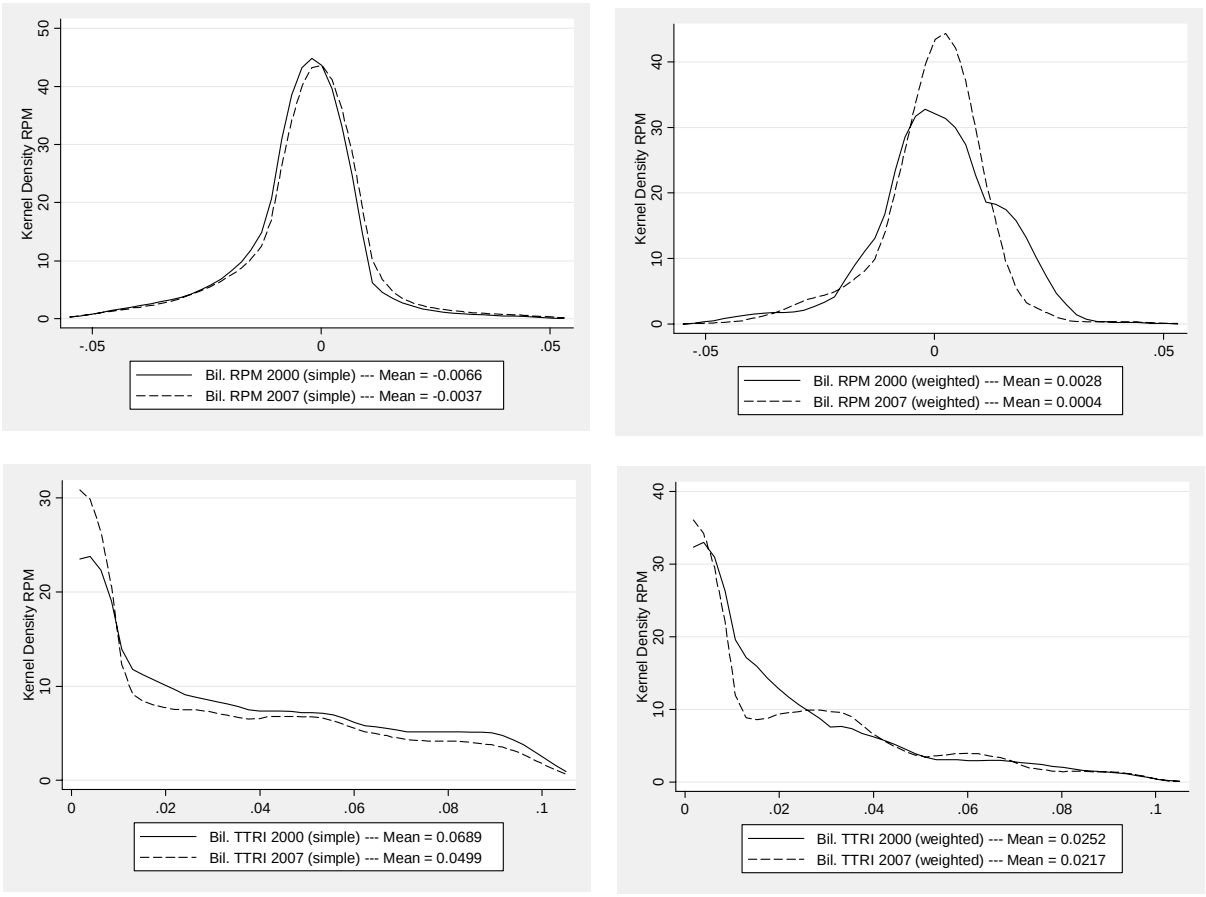

Figure 2 - Correlation in the changes of TTRI and RPM (2000 - 2007)

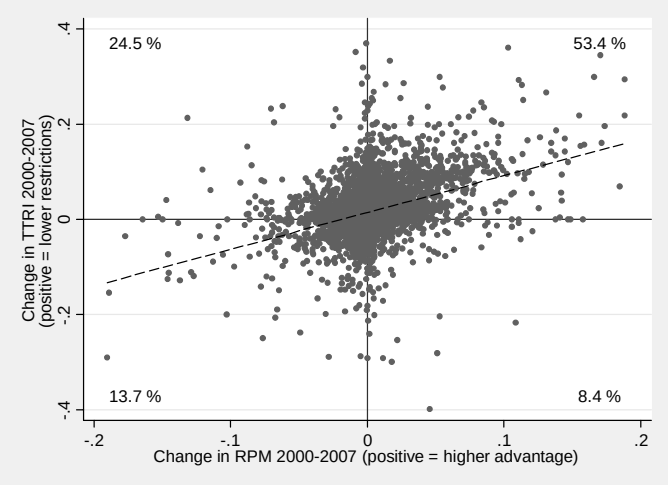

Table 4 - Gravity Model Results with Standard Measure of Preferential Margin

Dependent variable: Natural log of export

	(4')	(5')	(6')	(7')	(11)
Pref Margin	0.0251	0.0121			0.145
	(0.1089)	(0.1104)			(0.1252)
Ln (1+TTRI)	-0.744***	-0.754***			-1.756***
	(0.0934)	(0.0941)			(0.1021)
Diff_ Pref Margin			-0.0277	-0.0301	
			(0.1017)	(0.1032)	
Diff_TTRI			-0.665***	-0.658***	
			(0.2066)	(0.2081)	
Importer-year	Yes	Yes	Yes	Yes	No
Exporter-year	Yes	Yes	Yes	Yes	No
Country-pair	Yes	Yes	-	-	Yes
Weighted	No	Yes	No	Yes	No
Observations	50031	50031	42140	42140	
Adjusted R^2	0.956	0.885	0.086	0.085	
Within R^2	0.303	0.308	-	-	

Robust standard errors in parentheses (* p < 0.1, ** p < 0.05, *** p < 0.01)

Table 4 - Effects of Changes in Market Access Conditions, by Country

Country Name	Code	Percentage changes in trade 2007 vs 2000			Percentage changes in trade 2007 vs MFN		
		Total	TTRI	RPM	Total	TTRI	RPM
Algeria	DZA	0.34%	0.28%	0.07%	0.39%	0.37%	0.02%
Argentina	ARG	3.64%	2.69%	0.96%	4.09%	3.14%	0.95%
Australia	AUS	0.56%	0.58%	-0.02%	0.27%	0.32%	-0.05%
Austria	AUT	-0.01%	0.23%	-0.24%	2.21%	2.10%	0.11%
Azerbaijan	AZE	0.26%	0.10%	0.16%	0.94%	0.82%	0.12%
Bangladesh	BGD	-0.25%	0.07%	-0.32%	4.02%	3.46%	0.56%
Belgium	BEL	2.35%	1.21%	1.14%	2.45%	2.33%	0.12%
Benin	BEN	-0.06%	0.31%	-0.38%	2.04%	1.90%	0.14%
Bolivia	BOL	2.29%	1.75%	0.54%	6.80%	5.15%	1.65%
Brazil	BRA	1.18%	0.87%	0.31%	2.34%	2.10%	0.24%
Bulgaria	BGR	1.17%	0.56%	0.61%	2.20%	2.09%	0.10%
Cameroon	CMR	-0.12%	-0.31%	0.18%	1.22%	1.11%	0.11%
Canada	CAN	-0.05%	0.08%	-0.13%	1.84%	1.64%	0.21%
Chile	CHL	0.98%	0.92%	0.06%	1.92%	1.67%	0.25%
China	CHN	0.21%	0.34%	-0.13%	-0.12%	0.17%	-0.29%
Colombia	COL	3.21%	2.43%	0.78%	3.62%	2.92%	0.70%
Costa Rica	CRI	2.48%	1.97%	0.51%	3.78%	3.37%	0.41%
Cote D' Ivoire	CIV	1.56%	1.20%	0.37%	1.94%	1.78%	0.16%
Croatia	HRV	1.35%	0.93%	0.42%	2.16%	1.96%	0.20%
Czech Rep	CZE	2.12%	1.22%	0.90%	2.48%	2.33%	0.15%
Denmark	DNK	0.26%	0.40%	-0.14%	1.76%	1.68%	0.08%
Ecuador	ECU	3.88%	3.47%	0.41%	4.88%	4.37%	0.51%
Egypt	EGY	2.67%	2.16%	0.51%	2.46%	2.22%	0.24%
El Salvador	SLV	7.67%	5.54%	2.13%	7.41%	5.58%	1.83%
Estonia	EST	0.93%	0.69%	0.24%	1.74%	1.63%	0.10%
Ethiopia	ETH	0.02%	-0.04%	0.06%	0.92%	0.84%	0.08%
Finland	FIN	-0.06%	0.02%	-0.08%	0.87%	0.85%	0.02%
France	FRA	-0.04%	0.15%	-0.19%	2.04%	1.91%	0.13%
Ghana	GHA	0.70%	0.46%	0.24%	1.60%	1.59%	0.01%
Greece	GRC	0.08%	0.57%	-0.49%	2.96%	2.84%	0.12%
Guatemala	GTM	5.55%	4.02%	1.53%	6.26%	4.88%	1.38%
Germany	DEU	0.03%	0.18%	-0.15%	2.10%	1.96%	0.14%
Honduras	HND	7.02%	5.06%	1.96%	6.87%	5.18%	1.69%
Hong Kong	HKG	1.21%	0.94%	0.26%	0.48%	0.63%	-0.15%
Hungary	HUN	1.92%	1.24%	0.69%	2.05%	1.89%	0.17%
Iceland	ISL	5.26%	4.05%	1.21%	3.24%	2.87%	0.37%
India	IND	0.25%	0.42%	-0.17%	0.10%	0.43%	-0.33%
Indonesia	IDN	2.77%	2.69%	0.09%	0.76%	0.78%	-0.03%
Ireland	IRL	0.15%	0.33%	-0.18%	1.02%	0.95%	0.07%
Italy	ITA	0.23%	0.39%	-0.16%	2.00%	1.87%	0.13%
Israel	ISR	0.76%	0.66%	0.10%	1.00%	0.95%	0.05%
Japan	JPN	0.02%	0.09%	-0.07%	-0.30%	0.10%	-0.41%
Jordan	JOR	2.78%	2.03%	0.75%	2.00%	1.68%	0.32%

Table 4 (continued) - Effects of Changes in Market Access Conditions, by Country

Country Name	Code	Percentage changes in trade 2007 vs 2000			Percentage changes in trade 2007 vs MFN		
		Total	TTRI	RPM	Total	TTRI	RPM
Kazakhstan	KAZ	0.38%	0.12%	0.26%	1.25%	1.06%	0.19%
Kenya	KEN	3.27%	2.41%	0.86%	4.59%	3.58%	1.00%
Korea Rep.	KOR	0.36%	0.37%	0.00%	-0.31%	0.09%	-0.39%
Latvia	LVA	0.65%	0.48%	0.17%	2.80%	2.72%	0.08%
Lebanon	LBN	3.12%	2.63%	0.49%	3.04%	2.50%	0.54%
Lithuania	LTU	1.42%	1.01%	0.41%	2.77%	2.63%	0.14%
Malaysia	MYS	0.39%	0.35%	0.04%	0.47%	0.43%	0.04%
Mauritius	MUS	5.57%	3.83%	1.74%	7.53%	6.48%	1.06%
Mexico	MEX	0.18%	0.33%	-0.15%	2.40%	2.04%	0.37%
Morocco	MAR	4.38%	3.27%	1.11%	4.13%	3.71%	0.42%
Netherlands	NLD	-0.18%	0.10%	-0.28%	2.28%	2.18%	0.10%
New Zealand	NZL	0.90%	0.95%	-0.06%	0.23%	0.52%	-0.29%
Nicaragua	NIC	5.34%	3.90%	1.44%	5.92%	4.65%	1.27%
Nigeria	NGA	0.33%	0.32%	0.01%	1.54%	1.57%	-0.03%
Norway	NOR	0.95%	0.65%	0.31%	0.77%	0.78%	-0.01%
Oman	OMN	-0.20%	-0.18%	-0.02%	0.09%	0.12%	-0.03%
Peru	PER	2.19%	1.74%	0.45%	2.89%	2.55%	0.35%
Philippines	PHL	0.74%	0.56%	0.18%	1.04%	0.88%	0.16%
Poland	POL	1.68%	0.92%	0.77%	3.07%	2.92%	0.15%
Portugal	PRT	-0.44%	0.04%	-0.48%	3.42%	3.13%	0.29%
Romania	ROM	1.94%	1.02%	0.92%	3.07%	2.75%	0.32%
Russian Fed.	RUS	0.47%	0.44%	0.03%	0.61%	0.67%	-0.06%
South Africa	ZAF	0.51%	0.48%	0.03%	0.62%	0.68%	-0.06%
Saudi Arabia	SAU	0.02%	0.01%	0.01%	0.24%	0.24%	0.00%
Senegal	SEN	0.47%	0.65%	-0.18%	4.42%	3.95%	0.47%
Singapore	SGP	0.56%	0.45%	0.11%	0.60%	0.50%	0.10%
Slovakia	SVK	0.52%	0.60%	-0.07%	2.89%	2.63%	0.26%
Slovenia	SVN	2.02%	1.16%	0.86%	2.49%	2.34%	0.15%
Spain	ESP	0.19%	0.41%	-0.22%	3.23%	3.05%	0.18%
Sri Lanka	LKA	2.03%	1.66%	0.38%	1.71%	1.70%	0.01%
Sweden	SWE	0.26%	0.32%	-0.06%	1.36%	1.33%	0.04%
Taiwan	TWN	0.64%	0.68%	-0.03%	-0.20%	0.06%	-0.25%
Tanzania	TZA	1.60%	1.62%	-0.02%	2.03%	1.89%	0.15%
Thailand	THA	0.73%	0.61%	0.12%	1.22%	1.14%	0.08%
Trinidad Tbg	TTO	0.66%	0.32%	0.34%	1.71%	1.42%	0.29%
Tunisia	TUN	3.45%	2.29%	1.16%	3.87%	3.28%	0.60%
Turkey	TUR	4.00%	2.65%	1.36%	3.47%	3.14%	0.33%
Uganda	UGA	0.27%	0.14%	0.13%	1.99%	1.72%	0.27%
Untd.Kingdom	GBR	0.02%	0.09%	-0.07%	1.43%	1.36%	0.07%
Uruguay	URY	4.87%	4.07%	0.79%	4.54%	3.83%	0.71%
USA	USA	-0.35%	0.05%	-0.40%	2.16%	1.88%	0.28%
Venezuela	VEN	2.32%	1.97%	0.35%	3.46%	3.13%	0.33%
Zambia	ZMB	0.62%	0.68%	-0.06%	0.88%	0.74%	0.14%
Simple Average		1.5%	1.2%	0.3%	2.3%	2.1%	0.3%