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Market Access in International Trade: The North-South Divide and Regional Agreements*

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Very preliminary and incomplete.

Abstract

This paper develops a method of assessment of market access difficulties with an application to trade patterns between developing and developed countries. The method also offers a renewal of the assessment of the impact of regional trading arrangements. We use a micro-founded gravity-type model of trade patterns to estimate the impact of national borders on revealed access to Northern markets by Southern producers. Everything else equal, in the nineties, a rich country imports on average 276 times more from itself than from a developing country, only 31 times more when importing from another rich country. Results reveal that those difficulties faced by developing countries' exporters in accessing developed countries' consumers are furthermore higher than the reciprocal. Currently, the tariff equivalents of those border effects differ by around 30 percentage points. This asymmetry gets up to 50 points when considering trade between rich countries and lower middle income ones. Those considerable difficulties in Northern market access have however experienced a noticeable fall since the mid seventies. Another of our results concerns the impact of tariffs on market access. While tariffs still have in general an influence on trade patterns, our estimates suggest that they are an important component of market access difficulties faced by Southern exporters on Northern markets.

JEL classification: F12, F15
Keywords: Market Access, North-South Trade, Border Effects, Gravity.

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1 Introduction

Despite preferential access granted by the Northern countries to the exporters of the developing world, there are claims that market access remain limited. Those claims have been an important component of the arguments of developing countries in the recent steps of multilateral trade liberalization talks. Leaders of the developing world insist that access to Northern countries' markets is a much needed pre-requisite to further progress in the talks. The frustration of those countries is of course important for agricultural goods, but there is also a widespread feeling that, even for manufactured goods, the market access commitments of the Uruguay Round have not been fully implemented. Those protests from officials which culminated at the WTO Cancún ministerial meeting in September 2003, are seemingly backed up by the apparently low level of the market share of rich countries detained by exporters from LDCs. The WTO reports that the share of Least Developed Countries in total imports of Northern America was 0.8% in 1980 and 0.6% in 2000. The corresponding figures for the Western Europe were 1% and 0.5%, Japan's figures were 1% and 0.3% (WTO, 2001).

However instructive, this type of figure cannot be sufficient to draw conclusions on the level of market access experienced by Southern producers on Northern markets. The first limitation is that we don't know a priori what to compare those numbers to. Any serious assessment of market access based on trade flows needs to specify a *benchmark* of trade patterns, to which actual international exchanges of goods will be compared. Such a benchmark can only be provided by theory. We use here a theoretical framework of the "new trade" type, which combines imperfect competition and trade costs to give an empirically estimable gravity-type equation. Difficulties in market access is measured as a (negative) deviation from this benchmark.[1]

A second problematic issue with the use of market shares to assess market access such as the WTO figures above mentioned is that it usually misses most of the action. When saying that in 1999, the EU countries on average had only 0.4% of their imports originating from LDCs, one is in fact only comparing relative access among *foreign* producers on the EU market. The problem with this is that, in most products, the large majority of overall demand in a country is met by domestic producers, not foreign. A more sensible index of market access in the United States for instance must take into account the market share of foreign producers in the overall demand for a good expressed by American consumers. This is what the *border effect* literature does: Consider trade flows inside countries as well as among countries and compare each import from foreign countries to imports from domestic producers in order to have a benchmark based on a situation of the best possible market access, the one faced by national producers.

We follow this method of market access measurement here and develop it to provide new results focused on developing countries' access to the Northern markets. This is made possible by the construction and use of a new database extending the Trade and Production database recently issued by the World Bank (based primarily on COMTRADE and UNIDO data) to cover more countries and years. A specific feature of our study is to identify in the border effect measurement of market access, the part to be associated with observed direct protection (tariffs). A "by-product" of the method is the provision of new estimates of the impact of Regional Trading Arrangements, both involving Northern and Southern countries' combinations, on trade patterns. Here again border effects renew the analysis: The benchmark against which trade patterns inside the RTA are compared is a case of

[1] We therefore rely on an indirect measure of protection: Protection is revealed by distortions in trade flows, after having controlled for supply capacity, distance costs, prices as dictated by the theoretical framework. Alternatively, one can try to measure protection directly through the collection of formal trade barriers whether tariff-related or not. Anderson and van Wincoop (2003b) survey both types of works.

supposedly high market integration: The national market.

The remainder of the paper is as follows: Section 2 motivates the use of the border effects methodology when measuring market access. Section 3 specifies the theoretical foundations of our model, the empirical specification derived from it as well as the data used. Section 4 provides results for overall market access to North by Southern producers, and gives details concerning the evolution of this access over recent years as well as differences across industries.

2 Measuring international market openness with border effects.

Why do we need to study the impact of national borders on trade flows? The reason lies in the fact that *international* trade flows are not sufficient to gauge international markets integration. This statement is based on the simple idea that *two countries could be considered perfectly integrated if the national border separating them had no specific impact on where consumers choose to source their purchases and where producers can sell their output.* In fact, in the European Union, this is best summarized as the whole idea of the *Single* Market, which explicitly states its goal to be the abolition of the economic significance of national borders. A recent official document (European Commission, 2003) of the European Commission is extremely clear about this in its title: *The Internal Market – Ten Years Without Frontiers.*

The measure of the degree of international fragmentation of market is therefore by nature linked to the assessment of the impact of national borders. In order to make that assessment, one needs to consider international trade flows of course but also flows of goods *inside* each country and compare the two. To do this comparison, a model of bilateral trade flows is need to describe what a "normal" trade flow should be. The *gravity equation* is the ideal candidate for this role thanks to its old empirical success in describing bilateral trade volumes. This methodology of adding intra-national trade flows to a classical bilateral trade equation in order to measure the impact of national borders was the motivation behind the seminal work of McCallum (1995) soon followed by the application and extension of the framework by Wei (1996) for the cases where trade flows between sub-national regions are missing. Indeed, even in the absence of flows between sub-national regions, you can still measure the *total* volume of trade occurring within a country. This is simply equal to the overall production of the country minus its total exports, which gives the total value of goods shipped from a country to its own consumers. This observation can then be inserted in a bilateral trade equation, together with all the international flows. This is the way we proceed here. Our framework also incorporates recent advances in the modeling of gravity equations, turning back to trade theory to guide the empirical specification (recent examples and surveys of those approaches include Anderson and van Wincoop, 2003a and 2003b, and Feenstra, 2003).

The border effects methodology has important advantages in the study of *market integration*:

- First, it offers a *better benchmark* of integration than the traditional gravity equation framework. Take as an example the attempts to measure the impact of EU membership on trade flows (Aitken, 1973 is one of the first such study, Frankel, 1997, Frankel et al., 1995 and Soloaga and Winters, 2001 are recent examples of such work). The existing literature seeks to find a positive deviation of internal EU trade compared to a benchmark, which is usually trade among OECD countries. It seems however far more reasonable to inverse the logic and look for negative deviations from what would be a perfectly integrated zone: A nation.

- For a lot of issues, the border effect measure is also a useful methodology because it captures *all* impediments to trade related to the existence of the national borders, through their impact on trade flows. Most of those impediments are hard to measure individually, (one only needs to consider the poverty of available statistics on NTBs even inside the European Community at the launching of the Single Market Programme), and the global image is therefore useful. Related is the fact that if impediments rise because of deliberate trade policy changes, there will usually be a strong will of countries to hide this behavior by using sophisticated NTB schemes[2] that are very hard to detect for the economist.

- Border effects are more informative in the study of the evolution of trade barriers. In a traditional gravity equation, using for instance a dummy variable for trade taking place inside the EU, how should we interpret a rise in the coefficient on this dummy variable? Using the traditional Vinerian interpretation of regional integration, this rise can first come from consumers in EU countries substituting domestic goods in favor of foreign (EU-origin) goods (*trade creation*). The rise can however also come from substitution among imported goods, in favor of EU producers and reducing imports from third countries (*trade diversion*). The gravity equation in its most traditional form (and even in more elaborated forms like Fukao et al., 2003, recent paper) find it hard to differentiate among the two causes, whereas border effects methodology enables to track a potential fall in the surplus of trade taking place inside countries, and therefore separate trade creation from trade diversion effect. John Romalis (2002) provides an intermediate approach, where a bilateral trade equation of US imports is first run, and US imports from self are then used to compute trade diversion effects of NAFTA and CUSFTA.

We will therefore use the border effects methodology here, combining international and intranational trade flows in a gravity type equation. The precise specification of this equation stays however to be described, and this requires the presentation of our theoretical model, to which we know turn.

3 The model and estimable equation

We will work here with a specific form of a gravity-type equation. There are several theoretical foundations to this type of empirical construct. A theoretical prediction of the gravity type will arise in virtually all trade models with complete specialization, as Evenett and Keller (2003) show. Feenstra (2003) provides a very complete description of the link between the gravity equation and bilateral trade patterns in a monopolistic competition framework. We use here a specific form of this model: The Krugman (1980) model of monopolistic competition and trade in an N-country setting, which yield very simple estimable predictions for trade volumes directly extracted from theory.

Suppose that consumers in country i have a two-level utility function where the upper level is Cobb-Douglas with expenditure parameter μ_i, thus giving rise to fixed expenditure shares out of income, Y_i. The lower level utility function is a constant elasticity of substitution (CES) aggregate of differentiated varieties produced in the considered industry, with σ representing an inverse index of product differentiation.

[2]Not least because all rules of multilateral agreements signed by countries belonging to Regional Integration Arrangements stipulate that regional blocks should not raise their external level of protection.

$$U_i = \left(\sum_{j=1}^{N} \sum_{h=1}^{n_j} (a_{ij} c_{ijh})^{\frac{\sigma-1}{\sigma}} \right)^{\frac{\sigma}{\sigma-1}}.$$

As is well know, the CES structure implies a love for variety, with consumers willing to consume all available varieties. We will work here with a version where individuals can have different preferences over varieties depending on their place of production, allowing in particular for home bias. This preference parameter of consumers in i for varieties produced in j is denoted a_{ij}.

Some of those varieties being produced in foreign countries, we need to model trade costs, τ_{ij} supposed to be *ad valorem*, and incurred by the consumer when the good is shipped from country j to country i. The delivered price p_{ij} faced by consumers in i for products from j is therefore the product of the mill price p_j and the trade cost. Trade costs include all transaction costs associated with moving goods across space and national borders.

Denoting c_{ij}, the demand for a representative variety produced in j, the demand function derived from this system gives the bilateral total imports by country i from country j for a given industry:

$$m_{ij} = n_j p_{ij} c_{ij} = n_j a_{ij}^{\sigma-1} p_j^{1-\sigma} \tau_{ij}^{1-\sigma} \mu_i Y_i P_i^{\sigma-1}, \tag{1}$$

where $P_i = (\sum_k n_k a_{ik}^{\sigma-1} p_k^{1-\sigma} \tau_{ik}^{1-\sigma})^{1/(1-\sigma)}$ is the "price index" in each location.

We can see from (1) that trade costs influence demand more when there is a high elasticity of substitution, σ. Following Head and Mayer (2000), we take the ratio of m_{ij} over m_{ii}, the region i's imports from itself, the $\mu_i Y_i P_i^{\sigma-1}$ term then drops and we are left with relative numbers of firms, relative preferences, and relative costs in i and j:

$$\frac{m_{ij}}{m_{ii}} = \left(\frac{n_j}{n_i} \right) \left(\frac{a_{ij}}{a_{ii}} \right)^{\sigma-1} \left(\frac{p_j}{p_i} \right)^{1-\sigma} \left(\frac{\tau_{ij}}{\tau_{ii}} \right)^{\sigma-1}. \tag{2}$$

To estimate (2), we need to specify more fully the model. The first step is to use to supply side characteristics of the monopolistic competition model. Firms producing q_j in country j employ l_j workers in an IRS production function $l_j = F + \gamma q_j$, where F is a fixed (labour) costs, and γ the inverse productivity of firms. Profits are $\pi_j = p_j q_j - w_j(F + \gamma q_j)$, with w_j the wage rate in j. The Dixit-Stiglitz behavior of profit maximizing firms yields the well-known fixed markup over marginal costs ($p_j = \frac{\sigma}{\sigma-1} \gamma w_j$), which gives us a first result to be used in equation (2):$\frac{p_j}{p_i} = \frac{w_j}{w_i}$. Using the pricing equation, together with the free entry condition, we get the equilibrium output of each representative firm, $q_j = \frac{F(\sigma-1)}{\gamma}$. With identical technologies, $q_j \equiv q$, $\forall j = 1..N$. Noting v_j the value of production for the considered industry in j, $v_j = q p_j n_j$, and we get the second substitution to be made in equation (2):$\frac{n_j}{n_i} = \frac{v_j}{v_i} \frac{w_i}{w_j}$.

Finally, functional forms for trade costs (τ_{ij}) and preferences (a_{ij}) have to be specified in order to get an estimable equation.

- Trade costs are a function of distance (d_{ij}, which proxies for transport costs) and "borders-related costs", which can consist of tariffs and/or broadly defined Non Tariff Barriers (quantitative restrictions, administrative burden, sanitary measures...). We note the ad valorem equivalent of all borders-related costs brc_{ij}:

$$\tau_{ij} \equiv d_{ij}^{\delta} (1 + \text{brc}_{ij}).$$

Border-related costs related costs must be allowed to be quite flexible in our framework. Our primary goal is to assess a possible North-South divide in market access, we therefore need to allow for different levels of broadly-defined protection in each (North-South and South-North) direction. An important issue is also the impact of regionalism. We want to control for the impact of membership of Regional Trading Arrangements (RTAs) in the assessment of North markets' access by Southern exporters. Finally, we observe some of the actual protection taking place between importing and exporting countries (tariffs). We hence want to be able to control for tariffs, in order to assess the share of border effects that can actually be explained by this simple determinant.

In the most general formulation, we assume the following structure for border-related costs, which vary across country pair and depend on the *direction* of the flow for a given pair: $1 + \text{brc}_{ij} \equiv (1 + t_{ij})(\exp[\eta E_{ij} + \theta \text{RTA}_{ij} + \varphi \text{NS}_{ij} + \psi \text{SN}_{ij}])$. In this specification, t_{ij} denotes the ad valorem bilateral tariff, RTA_{ij} is a dummy variable set equal to 1 when $i(\neq j)$ and j belongs to a regional integration agreement. NS_{ij} is a dummy variable set equal to 1 when $i(\neq j)$ belongs to the North and j belongs to the group of Southern countries. SN_{ij} is a dummy variable set equal to 1 in the reverse case. E_{ij} is a dummy variable set to one when both partners belong to the same group of countries (North or South depending on the model estimated). All parameters are expected to be positive, denoting tariff equivalent of non tariff barriers. We expect $\theta > 0$ to be the lowest of those parameters, which will be true if, as was found in the previous literature, all national borders impose transaction costs, with the minimum burden of those costs being between RTA members. The ranking of φ , ψ and η is the primary open question we want to answer here.

- Preferences have a random component e_{ij}, and a systematic preference component for goods produced in the home country, β. Sharing a common language is assumed to mitigate this *home bias*.

$$a_{ij} \equiv \exp[e_{ij} - (\beta - \lambda L_{ij})(E_{ij} + \text{RTA}_{ij} + \text{NS}_{ij} + \text{SN}_{ij})].$$

  L_{ij} is set equal to one when two different countries share the same language. When L_{ij} switches from 0 to 1, home bias changes from β to $\beta - \lambda$.

We obtain an estimable equation from the monopolistic Krugman (1980) competition equation with home bias. In its more general form, the estimated equation in the next sections will be:

$$\begin{aligned} \ln\left(\frac{m_{ij}}{m_{ii}}\right) &= -(\sigma-1)[\beta+\eta] + \ln\left(\frac{v_j}{v_i}\right) - \sigma \ln\left(\frac{w_j}{w_i}\right) \\ &\quad -(\sigma-1)\ln(1+t_{ij}) - (\sigma-1)\delta \ln\left(\frac{d_{ij}}{d_{ii}}\right) + (\sigma-1)\lambda L_{ij} \\ &\quad -(\sigma-1)[\theta-\eta]\text{RTA}_{ij} - (\sigma-1)[\varphi-\eta]\text{NS}_{ij} - (\sigma-1)[\psi-\eta]\text{SN}_{ij} + \epsilon_{ij}, \end{aligned} \tag{3}$$

with $\epsilon_{ij} = (\sigma - 1)(e_{ij} - e_{ii})$.

The constant of this regression ($-(\sigma-1)[\beta+\eta]$) gives the border effect of international trade for countries that belong to the same group, the North for instance, without being part of an RTA in the sample considered. It includes both the level of protection of the importing country (η) and the home bias of consumers (β). The coefficient on RTA_{ij} gives the additional volume of trade generated by the agreement, keeping constant the other characteristics of the member countries. Adding this coefficient to the constant and taking the antilog of the sum, we get the level of the border effect

inside the RTA, which consists of both home bias (β) and remaining trade costs (θ). The coefficient on NS_{ij} indicates the additional difficulty for developing countries in their access to the Northern markets. Symmetrically, SN_{ij} indicates the additional difficulty when the Northern exporters want wants to sell their products on Southern markets. There will be several versions of (3) estimated below. We present in particular results with and without tariffs in the regression, to provide a view of the part of the border effect they can explain alone. No paper (to date) incorporates the level of bilateral tariffs in border effects' equations. It is clear from equation (3), that omitting the $\ln(1+t_{ij})$ term will result in the "missing trade" (caused in reality by tariffs) to be attributed to the impact of crossing national borders (the ones where there are tariffs implemented).

3.1 Data requirements

The needed data involves primarily bilateral trade and production figures in a compatible industry classification for developed and developing countries. Those come from the Trade and Production 1976-1999 database made available by Alessandro Nicita and Marcelo Olarreaga at the World Bank, which compiles this data for 67 developing and developed countries at the ISIC rev2 3-digit industry level over the period 1976-1999. The original data comes principally from United Nations sources, the COMTRADE database for trade and UNIDO industrial statistics for the production. The World Bank files have a lot of missing values for production figures in recent years. We have largely extended the database on this aspect using more recent versions of the UNIDO CD-ROM together with OECD STAN data for OECD members. We also completed the trade data, using the harmonized database of international trade from CEPII (BACI[3]). We end up with rather complete data in our sample for 26 ISIC 3-digit industries. North countries are the high-income countries, as defined by the World Bank. The South is defined as the group of countries with a low or medium income.

The relative wage variable comes from UNIDO and consists of the industry's wage bill divided by the number of employees. We also experiment with a less detailed –but more complete, and maybe less noisy– variable directly capturing relative prices: The price level of GDP expressed relative to the United States. This data comes from the Penn World Tables v.6.1. In the end, the results are slightly better with this global price variable and we therefore present results only with prices.

As can be seen in equation (3), we need measures of distances between (d_{ij}) *and within* (d_{ii}) countries for the countries in the sample. Two potential problems arise: 1) How to define internal distances of countries? 2) How to make those constructed internal distances consistent with "traditional" international distances calculations? The second question is in fact crucial for obtaining a correct estimate of the border effect. Take the example of trade between the United Kingdom and Italy. The GDPs of the two countries being quite comparable, this will not affect much the ratio of own to international trade. The first reason why UK and Italy might trade more with themselves than with each other is that the average distance (and therefore transport costs) between a domestic producer and a domestic consumer is much lower than between a foreign producer and a domestic consumer. Suppose now that for some reason, one mis-measures the relative distances and thinks distance from Italy to Italy is the same as distance from UK to Italy. Then the observed surplus of internal trade in Italy with respect to the UK-Italy flow cannot be explained by differences in distances and has to be captured by the only remaining impediment to trade in the equation, the border effect. Any overestimate of the internal / external distance ratio will yield to a mechanic upward bias in the border effect estimate. CEPII has developed a new database of internal and

[3]http://www.cepii.fr/anglaisgraph/bdd/baci/baci.pdf

external distances,[4] which uses city-level data in the calculation of the distance matrix to assess the geographic distribution of population inside each nation. The basic idea is to calculate distance between two countries based on bilateral distances between cities weighted by the share of the city in the overall country's population. This procedure can be used in a totally consistent way for both internal and international distances, which solves the problems highlighted above. The database also contains the contiguity, common language, colonial relationship and common colonizer variables used here, which have been taken from Andrew Rose original data.

Tariffs can be measured at the bilateral level and for each product of the HS6 nomenclature in the TRAINS database from UNCTAD. We base our investigation on a rather crude measurement[5] of tariffs, namely considering weighted averages of bilateral tariffs obtained from TRAINS. Those tariffs are aggregated from Jon Haveman's treatment of TRAINS data (UTBC Database[6]) in order to match our ISIC rev2 industry classification using the world imports as weights for HS6 products. Even in manufactured goods, tariffs between industrialized countries are not negligible and (important for our empirical work below) vary quite substantially across industries and countries combinations. Tariffs in South-North and North-South combinations are of course even larger and we are interested in particular in assessing their impact on trade flows.

We also incorporate a set of variables intended to account for different levels of "bilateral affinity", which can result from historical and cultural links. Those links can promote trade either through a positive effect on bilateral preferences (a_{ij}) or through more complex channels involving the existence of business networks or similarity in institutional frameworks that potentially reduce transaction costs τ_{ij}. The common language variable already captures part of this effect. The colonial links variables (taken from Andrew Rose's online datasets) further belong to this set of variable that can affect bilateral North-South bilateral trade patterns in an important way. We also add the amount of bilateral aid between the trade partners, as a potentially distinct proxy for this type of political/cultural proximity. As as been shown in the literature (see Wagner, 2003 for a recent example), both directions of the relationship between trade and aid can be present. The data comes from Eurostat and we construct two related variables: One calculating the cumulated bilateral flow of aid per head received between the years 1985 and 1996, and the other one the same bilateral cumulated flow given by the developed country.

All regressions in section 4 are pooled across the set of industries used, while subsection 4.4 gives industry-level results.

4 Market access between Northern and Southern countries

4.1 Global results

Table 1 presents a simple version of equation 3. Column (1) involves the whole sample. Columns (2) and (3) give results when the sample is restricted to imports of developed countries, and columns (3) and (4) take the reciprocal case, considering imports by Southern countries and distinguishing

[4]Available at http://www.cepii.fr/anglaisgraph/bdd/distances.htm).

[5]As compared for instance with datasets that take into account the complex system of bilateral preferences across countries in the world at a detailed product level. This type of data however lacks any consistent time coverage which is important to keep here.

[6]http://www.eiit.org/Protection/extracts.html

between different exporters in terms of market access. Tariffs are included and data availability on this variable restricts the sample to the years 1992-1999.

The coefficient on relative production is relatively close to one as predicted by theory and often found in the gravity equation literature. The coefficient on distance is in line with the common findings of this type of regressions (see Disdier and Head, 2003). Coefficients on contiguity have a higher magnitude than usual and language has the usual signs and magnitude but is not always significant.

The first line of the first column gives the world average border effect. This estimate implies that, on average during the nineties, each country traded around 74 times more (exp(4.31)) within its national borders than with another country of the world. In the Northern markets, the estimated border effect from column 2 falls to 31 when the exporter is a Northern country but jumps to 276 when the exporter is a Southern country. The tariff equivalent of the difference in market access is quite substantial. The calculation of tariff equivalent requires an estimate of the price elasticity σ. There are several possible source for this parameter. The first one is the coefficient on the price variable. While consistently and significantly negative, the coefficient on the price term is however disappointing here, with a lot of volatility and too small implied values of σ. This result of low price elasticities when using directly proxies for prices is usual in the literature (see Erkel-Rousse and Mirza, 2002, for instance). The coefficient on tariffs can also be used and reveals an estimate of $\sigma - 1 = 5.03$ in column 1. While consistent with theory, this value of price elasticity suggests tariff equivalents of the border effects that are very high ($\exp(4.31/5.03) - 1 = 135\%$ is the tariff equivalent for worldwide sample). There are several good reasons why those estimates of σ are too low. First, the price variable certainly reflects quality differences in varieties across countries that bias downwards the estimate of price elasticity. Another argument is endogenous protection. Governments tend to protect industries where the high level of imports endangers domestic production, yielding a positive relationship between imports and tariffs that also biases σ downwards. Correcting those issues as been the subject of other studies and is beyond the scope of this paper. It seems however reasonable to rely on more sensible estimates provided by the recent empirical literature. Recent estimates of elasticities of substitution (Head and Ries, 2001, Eaton and Kortum 2002, Lai and Trefler, 2002 for instance) suggest that σ might be around 8 for developed countries in recent years. The tariff equivalent of North-North fragmentation level is then still $\exp(3.43/7) - 1 = 63\%$ while the figure is $\exp(5.62/7) - 1 = 123\%$ for imports coming from Southern countries. Note that those are the tariff equivalent of preferences and trade restrictions, *after having controlled for tariffs*, that exert a negative impact on trade on their own.

Although North-North trade is far from free, column (2) therefore reveals that, expressed in tariff equivalent, South-North trade is about two times harder. Column (3) details this revealed additional difficulties of Southern countries in market access by income level. Quite strikingly, it appears that revealed restrictions are increasing in the level of poverty of the exporting country. The point estimates indicate that low income exporters face a tariff equivalent of the border effect of $\exp(5.94/7) - 1 = 134\%$, while the figure for upper middle income exporters is only 112%. Note that the amounts of aid given to a developing country are positively and very significantly associated with market access of the donator, probably indicating that this variable is a good proxy for bilateral North-South affinity, in complement to colonial links that also very strongly promotes trade.

The contrast with developing countries' results shown in columns (4) and (5) is important. The overall level of openness of those markets is clearly lower than the Northern markets. However, while those countries trade on average about 194 times more with themselves than with another developing countries, this figure only goes down to 98 when the exporter originates from a Northern

Table 1: North-South market access, by income levels

	Dependent Variable: Ln Imports Partner/Own				
Model :	Whole sample	North imp.	North imp.	South imp.	South imp.
Border	-4.31^a				
	(0.06)				
Ln Rel. Production	0.82^a	0.86^a	0.86^a	0.82^a	0.82^a
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Ln Rel. Prices	-0.17^a	-0.81^a	-1.08^a	-0.50^a	-0.64^a
	(0.02)	(0.04)	(0.06)	(0.05)	(0.06)
Ln Rel.Distance	-0.82^a	-0.66^a	-0.68^a	-0.79^a	-0.80^a
	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)
Contiguity	1.34^a	1.41^a	1.34^a	1.60^a	1.59^a
	(0.04)	(0.05)	(0.05)	(0.05)	(0.05)
Common Language	0.38^a	0.03	0.06	0.74^a	0.75^a
	(0.03)	(0.04)	(0.04)	(0.04)	(0.04)
Ln (1+Tariff)	-5.03^a	-1.92^a	-2.00^a	-2.92^a	-2.81^a
	(0.28)	(0.29)	(0.29)	(0.25)	(0.25)
Colonial Link	0.89^a	0.92^a	0.91^a	0.48^a	0.44^a
	(0.06)	(0.07)	(0.07)	(0.05)	(0.05)
Common Colonizer	1.12^a			1.46^a	1.58^a
	(0.07)			(0.09)	(0.09)
Ln Aid Given		0.07^a	0.08^a		
		(0.01)	(0.01)		
Ln Aid Received				0.08^a	0.09^a
				(0.01)	(0.01)
Northern Exporters		-3.43^a	-3.30^a	-4.58^a	-4.40^a
		(0.07)	(0.07)	(0.12)	(0.12)
Southern Exporters		-5.62^a		-5.27^a	
		(0.08)		(0.11)	
Middle Income Upper Exporters			-5.26^a		-4.93^a
			(0.09)		(0.11)
Middle Income Lower Exporters			-6.11^a		-5.50^a
			(0.09)		(0.11)
Low Income Exporters			-5.94^a		-5.35^a
			(0.11)		(0.11)
N	220820	90512	90512	86279	86279
R^2	0.47	0.914	0.914	0.898	0.899
RMSE	2.607	2.457	2.447	2.553	2.546

Note: Standard errors in parentheses: ^{a}, ^{b} and ^{c} represent respectively statistical significance at the 1%, 5% and 10% levels. The reported standard errors take into account the correlation of the error terms for a given importer.

country. Southern exporters therefore face an equivalent level of access difficulty on Southern and Northern markets, while Southern markets are *relatively* open to Northern exports compared to the reciprocal flow. Expressed in tariff equivalent, the asymmetry between our groups of Northern and Southern countries is $\exp(5.62/7) - \exp(4.58/7) = 31$ percentage points. It gets up to $\exp(6.11/7) - \exp(4.40/7) = 52$ percentage points between the North and lower middle income countries.

4.2 The impact of regional agreements

Our objective in this section, is to introduce the impact of regional agreements in the regressions. To investigate this issue, we incorporate dummy variables capturing the lower (or higher) impact of borders on trade inside each RTA, and thus characterizing the extent of integration of the zone, compared to trade taking place in the rest of the sample. We identify five actual RTAs (EU, NAFTA, MERCOSUR, ASEAN, ANDEAN PACT). Some of those RTAs include only Northern countries, some only Southern ones, and NAFTA includes two developed countries and a developing country. The impact of those agreements is interesting for our matter in the perspective of several trading arrangements that might take place in the near future between Northern and Southern countries. The FTAA and the potential arrangements between the EU and MERCOSUR are the most prominent examples on which the impact of the existing set of RTAS can shed light.

The impact of the different RTAs is expected to be quite different. The European Union is undoubtedly the largest experiment of regional integration in the recent period, characterized by a long term commitment of member countries to achieve *wide-range integration*. EU will usually be here EU15 over the whole period. MERCOSUR is a customs union signed in 1991 between Brazil, Argentina, Paraguay and Uruguay but implemented in 1995, with member countries substantially liberalizing their internal trade during the transition period. The Common External Tariff concerned 85% of tariff lines in 1995 and a schedule for convergence towards complete CET and free trade was then agreed upon but significantly disturbed by the macroeconomic problems in Brazil and Argentina. NAFTA is a free trade agreement that entered into force between the USA, Canada and Mexico in January 1994. Tariff reductions among member countries were scheduled on a 10/15 years agenda. An interesting aspect is its North-South nature. ASEAN is Officially a free trade agreement between Indonesia, Malaysia, Singapore, Thailand and the Philippines since 1977, but intrabloc trade liberalization was really implemented on a large scale starting with AFTA in 1992 (Soloaga and Winters, 2001). Last, the Andean Pact, a rather old regional trade agreement, usually seen as having been less effective in true reductions of the level of protection in those countries.

Table 2 takes into account those five RTAs with dummies equal to one since the beginning of each agreement. Column (1) starts with an overall estimate of the impact of regional agreements in the complete sample. The estimate reveal that the average country in a regional agreement trades $\exp(4.82 - 1.62) \simeq 25$ times more with itself than with another country of the same RTA, while this ratio is 124 when no RTA covers the bilateral trade flow. The estimates for the border effects of EU countries in the North-North sample from column (2) is $\exp(4.16 - 0.85) \simeq 27$[7]. The free trade agreement between the United States and Canada also has a positive and significant impact on bilateral trade, although lower than the European Union. An interesting result on NAFTA is obtained from comparing columns (4) and (5). Mexico faces a level of fragmentation around 33 ($\exp(6.33 -$

[7]The estimate is higher than the most recent ones in the literature (taking representative coefficients mostly based on EU12 or even EU9 countries, Nitsch, 2000, finds a border effect around 10 in 1990, Head and Mayer, 2000, find 13 for the 1993-1995 period and Chen (2003) finds a multiplicative factor of 6 for internal trade flows in 1996). This is due to the fact that our sample includes all 15 EU countries.

Table 2: North-South market access, with regional arrangements

Model :	Dependent Variable: Ln Imports Partner/Own				
	Whole Sample	North → North	South → South	North → South	South → North
Border	-4.82^a	-4.16^a	-5.64^a	-4.07^a	-6.33^a
	(0.07)	(0.08)	(0.13)	(0.15)	(0.12)
Ln Rel. Production	0.80^a	0.81^a	0.85^a	0.72^a	0.86^a
	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)
Ln Rel. Prices	-0.22^a	-0.67^a	-0.44^a	-0.77^a	-0.87^a
	(0.02)	(0.08)	(0.05)	(0.08)	(0.04)
Ln Rel.Distance	-0.72^a	-0.61^a	-0.77^a	-0.78^a	-0.48^a
	(0.02)	(0.02)	(0.03)	(0.03)	(0.04)
Contiguity	1.00^a	0.89^a	1.49^a	1.34^a	1.45^a
	(0.03)	(0.04)	(0.06)	(0.12)	(0.15)
Common Language	0.46^a	0.53^a	0.84^a	0.40^a	-0.21^a
	(0.03)	(0.05)	(0.05)	(0.07)	(0.06)
Ln (1+Tariff)	-3.98^a	-3.51^a	-2.97^a	-2.69^a	2.21^a
	(0.23)	(0.53)	(0.30)	(0.27)	(0.48)
Colonial Link	0.83^a	0.89^a		0.66^a	0.94^a
	(0.06)	(0.06)		(0.07)	(0.09)
Common Colonizer			1.51^a		
			(0.09)		
Ln Aid Received				0.15^a	
				(0.01)	
Ln Aid Given					0.10^a
					(0.01)
Regional Trade Arrangement	1.62^a				
	(0.04)				
EU		0.85^a			
		(0.05)			
CUSA		0.59^a			
		(0.07)			
MERCOSUR			1.18^a		
			(0.13)		
ASEAN			1.12^a		
			(0.12)		
ANDEAN PACT			0.09		
			(0.10)		
NAFTA				1.29^a	2.82^a
				(0.34)	(0.14)
N	220820	47205	51431	34848	43307
R^2	0.483	0.518	0.439	0.423	0.393
RMSE	2.577	2.048	2.696	2.301	2.777

Note: Standard errors in parentheses: ^{a}, ^{b} and ^{c} represent respectively statistical significance at the 1%, 5% and 10% levels. The reported standard errors take into account the correlation of the error terms for a given importer.

2.82)) on the Northern American markets, while US and Canadian exporters' corresponding access is less difficult, with a level around 16 ($\exp(4.07-1.29)$). The estimated level of market access in the South-South combinations is extremely low (an estimated border effect of 281), but it is interesting to note that, contrary to the Andean Pact, MERCOSUR and ASEAN had a very sizeable impact on market access inside those agreements. Sharing a common colonizer also has a very substantial impact on reciprocal market access, confirming in a different setting the finding of Rose (2000).

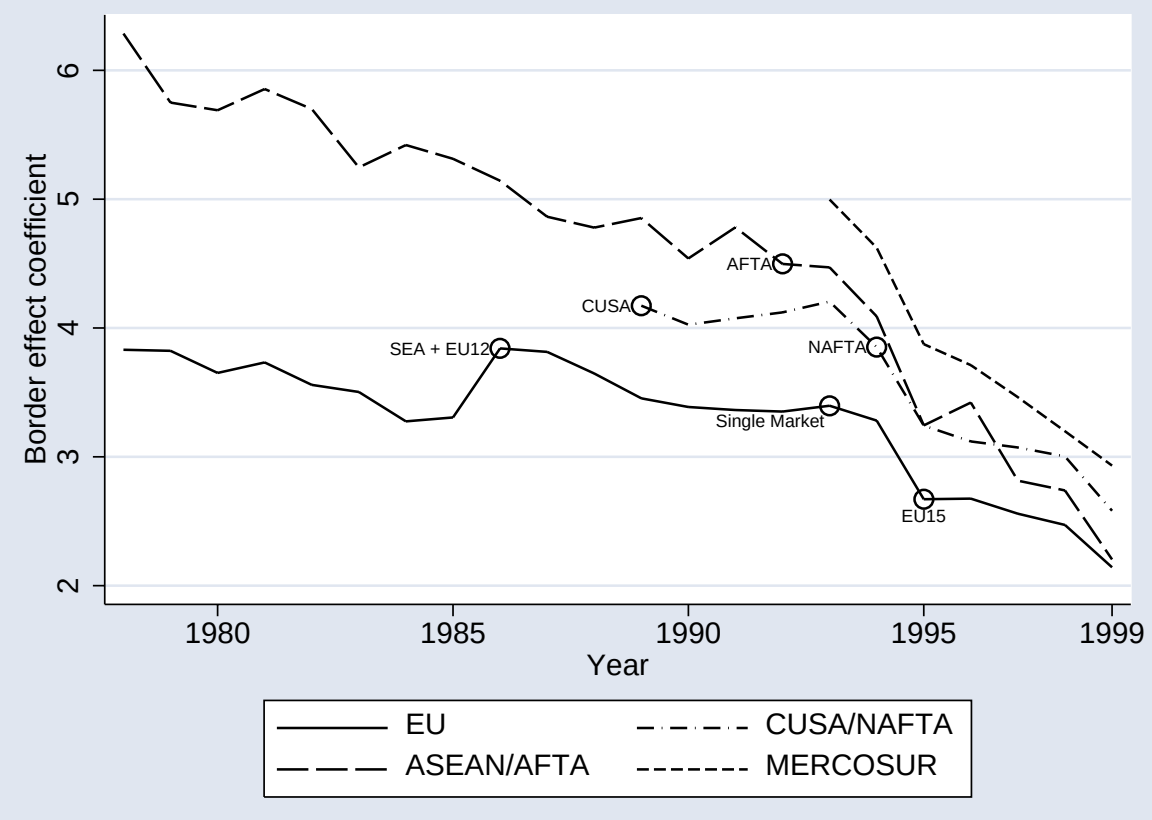
Last, it is interesting to note that once the sample is restricted to Northern imports from the South, the coefficient on tariffs becomes *positive* and significant (it is still positive but not significant when the aid variable is removed). This might be the result of several mechanisms. First of all, this coefficient is related to the elasticity of substitution between foreign and domestic varieties. It might be true that varieties produced in the South are much less substitutable to varieties produced in a given developed country than North-produced varieties are. This effect should however be counterbalanced by the fact that this coefficient is also an indication of the degree of differentiation of goods and corresponding price elasticity, which should be higher, when the goods come from developing countries. A more plausible explanation again relates to the political economy of protection. It is quite likely that in the South to North direction of trade, governments target with high tariffs the industries where imports penetration is high and rising. In the reverse direction (trade from North to South), it is also quite possible, that the distribution of tariffs is more uniform and aims at lower reductions in trade volumes because tariff revenues are more important in the global budget constraint of the government. In unreported simple regressions, we indeed found that tariffs was positively correlated with imports/self trade ratio in the South-North combination, and negatively in the reverse direction. Last, it could also be that protection in developed countries with respect to developing countries' exports take much more sophisticated forms than simple tariffs. In those times of multilateral tariff reduction negotiations, Non-tariff barriers linked to phyto-sanitary, security or environmental concerns for instance may be used partly for protectionist purposes in a quite "efficient" way (see Fontagné and Mimouni, 2001, for recent evidence of this phenomenon).

Figure 1 graphs the evolution of border effects coefficients inside each of the actual RTAs.[8] This representation offers a richer picture of how market fragmentation is receding in each of those regional arrangements. A striking characteristic is the apparent convergence in the absolute level of integration of the EU, NAFTA and ASEAN. The EU starts far more integrated than the other two zones, but those gradually catch up and end up very close to the level of EU integration in the latest years. The increase in estimated EU fragmentation in 1986 comes from the membership of two relatively closed economies, Spain and specially Portugal. The evolution of MERCOSUR reveals also a downward trend of internal fragmentation.

For the most recent period, there seems to be a clear ranking of integration with EU countries being the most integrated zone followed by ASEAN and NAFTA and then MERCOSUR, for which border effect coefficients fall markedly in the period 1993-1995, which is interesting as 1995 is the date where internal trade liberalization should have been completed. The timing of the CUSA/NAFTA effect is also insightful. The estimated level of fragmentation falls markedly with NAFTA becoming effective in January 1994. Those results point to expected and reasonable estimates of the effect of trading arrangements, somehow more reassuring than Soloaga and Winters (2001) for instance who find an overall *negative* and significant impact of EU membership, no significant impact for NAFTA or ASEAN and an extremely important positive impact of MERCOSUR, roughly constant since

[8]Those estimates are based on simple regressions where, for each year, the relative trade flow is regressed on relative production, relative price, relative distance, contiguity, common language and a dummy variable for each RTA.

Figure 1: Evolution of the impact of regional agreements



1980. ASEAN is found here to have a sizeable impact on trade volumes, that is growing over time, the order of magnitude of the effect is comparable to what is found in Frankel (1997) and points to the dynamism of international trade in the region.

Taking the right benchmark to assess regional integration therefore seems crucial. The puzzling results in the previous literature where the deepest integration experiences did not seem to yield consistent important surpluses of trade are here qualified. The border effect methodology gives us a picture which seems more in line with the priors, with EU and NAFTA having a large impact on trade flows (although it should again be noted that those areas are still far from perfectly integrated even in recent years).

4.3 Evolution

Results in this section detail the evolution of market access over time, starting from 1976 and going to 1999. We are here focusing on access to Northern markets, and we investigate whether the current high level of revealed restrictions in market access is a persistent phenomenon, and whether there has been some progress recently on this front.

Table 3 gives overall results for the developed countries. The first three columns enables an overview of how coefficients evolve over three periods of time (1976-1983, 1984-1991 and 1992-1999). The fourth column restricts the sample to those observations for which tariffs are available. The fifth column gives results for the last period with tariffs included. Noteworthy is first the substantial improvement of the fit of the regression over time. This will remain true in all subsequent tables of this section: Our empirical specification of trade patterns is an increasingly good description of reality over time for the South $\rightarrow$ North trade, which is not the case in general when this type of regression is applied to North-North trade flows. A possible interpretation is that the underlying theoretical motivations of the regressions are increasingly relevant over time for the South-North trade flows. The first row of Table 3 reveals that, even if the current level of access to Northern markets is very restricted, it is *seven* times easier to enter those markets for a Southern country exporter now than what it used to be in the end of the seventies (from estimates of column 1 and 3). While room for improvement is clearly large, there has been considerable increase in the access of developing countries' products on developed countries' markets.

Whether the remaining level of difficulty in market access is due to remaining protection or other factors such as preferences for Northern products or different qualities of goods is hard to identify. One thing that appears clearly in all tables of this section is that tariffs are not the dominant explanation of market access restrictions in this type of South-North trade flows: Tariffs enter with the wrong positive sign in all specifications. One dimension of the data we can use to shed more light on this issue is the different importing countries in the North sample. If Southern producers face highly restricted market access because the varieties exported match relatively badly with Northern countries tastes, then the estimated border effects should be broadly similar across importing countries. As Tables 4, 5 and 6 reveal, there is on the contrary wide variance in those South-North border effects. During the 1992-1999 period, EU15 countries trade on average $\exp(7.12) = 1236$ times more with themselves than with a developing country of similar size, distance and other characteristics. This figure was only $\exp(5.02) = 151$ for the USA and Canada and $\exp(3.42) = 31$ for the Japanese market. The figure for the EU is quite impressive and hides wide disparities among countries, with some EU countries being much more closed than others to imports from the South. An additional aspect relates to colonial links and aid given. Due to the history of European colonial powers and to their current foreign policy instruments, a large number of developing countries do have the colonial link (with

Table 3: Difficulties for Developing Countries in Rich countries' Market Access over Time

	Dependent Variable: Ln Imports Partner/Own				
Model :	1976-1983	1984-1991	1992-1999	1992-1999	1992-1999
Border	-8.25^a	-7.01^a	-6.29^a	-6.21^a	-6.33^a
	(0.10)	(0.09)	(0.09)	(0.12)	(0.12)
Ln Rel. Production	0.70^a	0.78^a	0.84^a	0.87^a	0.86^a
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Ln Rel. Prices	-0.68^a	-0.78^a	-0.68^a	-0.86^a	-0.87^a
	(0.05)	(0.04)	(0.03)	(0.04)	(0.04)
Ln Rel.Distance	-0.21^a	-0.49^a	-0.50^a	-0.49^a	-0.48^a
	(0.03)	(0.03)	(0.03)	(0.04)	(0.04)
Contiguity	1.86^a	2.22^a	1.56^a	1.40^a	1.45^a
	(0.20)	(0.16)	(0.12)	(0.15)	(0.15)
Common Language	0.26^a	0.14^a	-0.10^b	-0.20^a	-0.21^a
	(0.05)	(0.04)	(0.04)	(0.06)	(0.06)
Colonial Link	0.60^a	0.54^a	0.96^a	0.92^a	0.94^a
	(0.09)	(0.08)	(0.07)	(0.09)	(0.09)
Ln Aid Given	0.11^a	0.12^a	0.11^a	0.11^a	0.10^a
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
NAFTA			2.74^a	2.78^a	2.82^a
			(0.12)	(0.14)	(0.14)
Ln (1+Tariff)					2.21^a
					(0.48)
N	53780	73540	80047	43307	43307
R^2	0.248	0.303	0.373	0.392	0.393
RMSE	2.937	2.856	2.821	2.78	2.777

Note: Standard errors in parentheses: ^{a}, ^{b} and ^{c} represent respectively statistical significance at the 1%, 5% and 10% levels. The reported standard errors take into account the correlation of the error terms for a given importer.

Table 4: Difficulties for Developing Countries in European Market Access over Time

	Dependent Variable: Ln Imports Partner/Own				
Model :	1976-1983	1984-1991	1992-1999	1992-1999	1992-1999
Border	-9.10^a	-7.92^a	-7.12^a	-6.93^a	-7.00^a
	(0.17)	(0.14)	(0.13)	(0.17)	(0.17)
Ln Rel. Production	0.66^a	0.75^a	0.82^a	0.87^a	0.86^a
	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)
Ln Rel. Prices	-0.67^a	-0.82^a	-0.78^a	-1.02^a	-1.03^a
	(0.06)	(0.05)	(0.03)	(0.05)	(0.05)
Ln Rel.Distance	0.04	-0.23^a	-0.27^a	-0.27^a	-0.28^a
	(0.04)	(0.04)	(0.03)	(0.04)	(0.04)
Contiguity	-0.46^c	-0.12	1.29^a	1.11^a	1.14^a
	(0.25)	(0.24)	(0.15)	(0.19)	(0.19)
Common Language	0.25^a	0.27^a	0.08	-0.19^b	-0.18^b
	(0.08)	(0.07)	(0.06)	(0.08)	(0.08)
Colonial Link	0.43^a	0.29^a	0.73^a	0.75^a	0.75^a
	(0.10)	(0.09)	(0.07)	(0.09)	(0.09)
Ln Aid Given	0.11^a	0.10^a	0.10^a	0.12^a	0.11^a
	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)
Ln (1+Tariff)					2.05^a
					(0.55)
N	36245	48291	54613	28478	28478
R^2	0.227	0.278	0.351	0.373	0.374
RMSE	2.939	2.879	2.808	2.74	2.738

Note: Standard errors in parentheses: ^{a}, ^{b} and ^{c} represent respectively statistical significance at the 1%, 5% and 10% levels. The reported standard errors take into account the correlation of the error terms for a given importer.

Table 5: Difficulties for Developing Countries in US and Canadian Market Access over Time

	Dependent Variable: Ln Imports Partner/Own				
Model :	1976-1983	1984-1991	1992-1999	1992-1999	1992-1999
Border	-6.62^a	-5.75^a	-5.02^a	-4.92^a	-5.02^a
	(0.17)	(0.13)	(0.15)	(0.20)	(0.20)
Ln Rel. Production	0.61^a	0.65^a	0.72^a	0.74^a	0.73^a
	(0.03)	(0.02)	(0.02)	(0.03)	(0.03)
Ln Rel. Prices	-1.26^a	-1.39^a	-1.11^a	-1.36^a	-1.35^a
	(0.12)	(0.09)	(0.08)	(0.10)	(0.10)
Ln Rel.Distance	-1.57^a	-1.60^a	-1.41^a	-1.47^a	-1.48^a
	(0.08)	(0.07)	(0.08)	(0.10)	(0.10)
Contiguity	2.96^a	2.62^a	2.22^a	2.04^a	2.03^a
	(0.13)	(0.11)	(0.13)	(0.17)	(0.17)
Common Language	0.63^a	0.28^a	-0.25^a	-0.21^a	-0.22^a
	(0.07)	(0.05)	(0.05)	(0.07)	(0.06)
Colonial Link	2.91^a	2.67^a	3.22^a	2.93^a	2.97^a
	(0.19)	(0.15)	(0.20)	(0.27)	(0.27)
Ln Aid Given	-0.21^a	-0.22^a	-0.21^a	-0.21^a	-0.21^a
	(0.02)	(0.01)	(0.02)	(0.02)	(0.02)
NAFTA			1.25^a	1.33^a	1.39^a
			(0.14)	(0.18)	(0.18)
Ln (1+Tariff)					2.43
					(1.50)
N	7623	10685	11950	7318	7318
R^2	0.354	0.404	0.433	0.454	0.455
RMSE	2.718	2.588	2.749	2.72	2.717

Note: Standard errors in parentheses: ^{a}, ^{b} and ^{c} represent respectively statistical significance at the 1%, 5% and 10% levels. The reported standard errors take into account the correlation of the error terms for a given importer.

coefficient of 0.73) set to one combined with a substantial amount of bilateral aid. The border effect for a developing country with a colonial link and receiving the mean per capita aid in our sample is in fact $\exp(7.12 - (0.1 * \ln(7.45) + 0.73)) = 487$. Note also that coefficients on distance are widely different, Japan, the USA and Canada being far more sensitive to distance than EU countries in their trade patterns with the developing world.

4.4 Industry-level market access

This section details industry-level results for the Northern imports from developing countries. The figures 2, 3, 4 and 5 report border effects coefficients in industry by industry regressions.[9] We obtain

[9]Those are simpler regressions than what is presented in the tables. For each industry, the relative trade flow is regressed on relative production, relative price, relative distance, contiguity and common language.

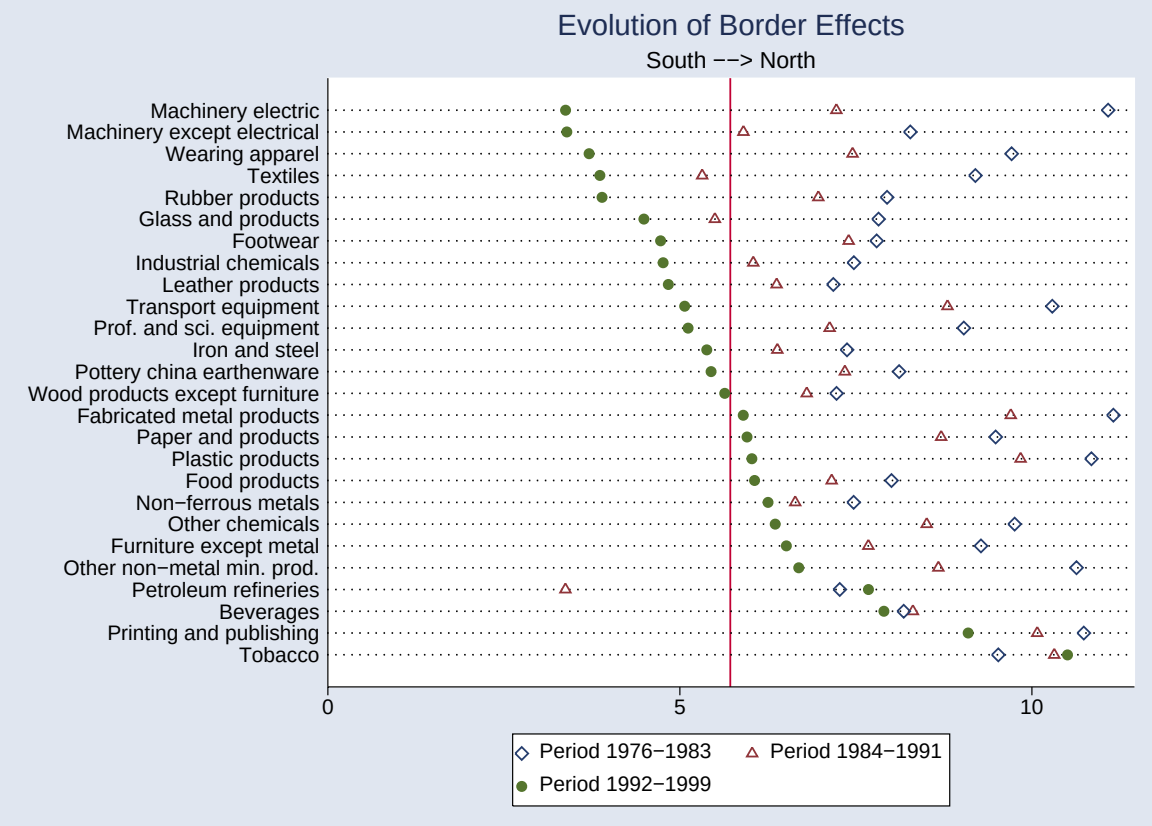
Table 6: Difficulties for Developing Countries in Japanese Market Access over Time

	Dependent Variable: Ln Imports Partner/Own				
Model :	1976-1983	1984-1991	1992-1999	1992-1999	1992-1999
Border	-5.08^a	-4.24^a	-3.42^a	-3.61^a	-3.62^a
	(0.28)	(0.27)	(0.26)	(0.29)	(0.29)
Ln Rel. Production	0.97^a	1.07^a	1.08^a	1.08^a	1.08^a
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Ln Rel. Prices	-0.55^b	-0.69^a	-0.68^a	-0.77^a	-0.77^a
	(0.22)	(0.13)	(0.09)	(0.11)	(0.11)
Ln Rel.Distance	-1.24^a	-1.37^a	-1.48^a	-1.43^a	-1.43^a
	(0.09)	(0.08)	(0.08)	(0.10)	(0.10)
Ln Aid Given	0.57^a	0.57^a	0.49^a	0.50^a	0.49^a
	(0.05)	(0.05)	(0.04)	(0.04)	(0.05)
Ln (1+Tariff)					0.19
					(1.31)
N	3581	4382	4814	3081	3081
R^2	0.358	0.48	0.581	0.593	0.593
RMSE	2.989	2.66	2.491	2.453	2.454

Note: Standard errors in parentheses: ^{a}, ^{b} and ^{c} represent respectively statistical significance at the 1%, 5% and 10% levels. The reported standard errors take into account the correlation of the error terms for a given importer.

those coefficients for the three different sub-periods, which enables comparisons across time.

Figure 2: Evolution of Market Access South → North



Overall results for the Northern importing countries are given in figure 2. The developed markets that are the most difficult to enter in the last period are Tobacco, Printing and publishing, beverages industries and petroleum refineries notably. On the opposite extreme, different types of machinery, Wearing apparel, textiles and chemicals are the relatively easiest markets to export to. All those industries have been characterized by considerable improvement in market access, with transport equipment and electric machinery being among the leading examples of products which switched from one of the most difficult to export to the North, to one of the easiest in twenty years.

Northern American markets are the ones with the highest variance in market access issues, maybe reflecting important targeting of industries in the protection scheme. Japan is the only of the Northern countries considered individually that actually exhibits reverse border effects, that is a revealed preferential access of Southern goods over domestic ones. This is true for professional equipment, machinery, apparel, footwear and leather notably for the latest years. Iron, Steel and Non ferrous metals have specifically high border effects for this country.

5 Conclusion

This paper develops a new method of assessment of market access difficulties with an application to trade patterns between developing and developed countries. We use a gravity-type model of

Figure 3: Evolution of Market Access South → EU15

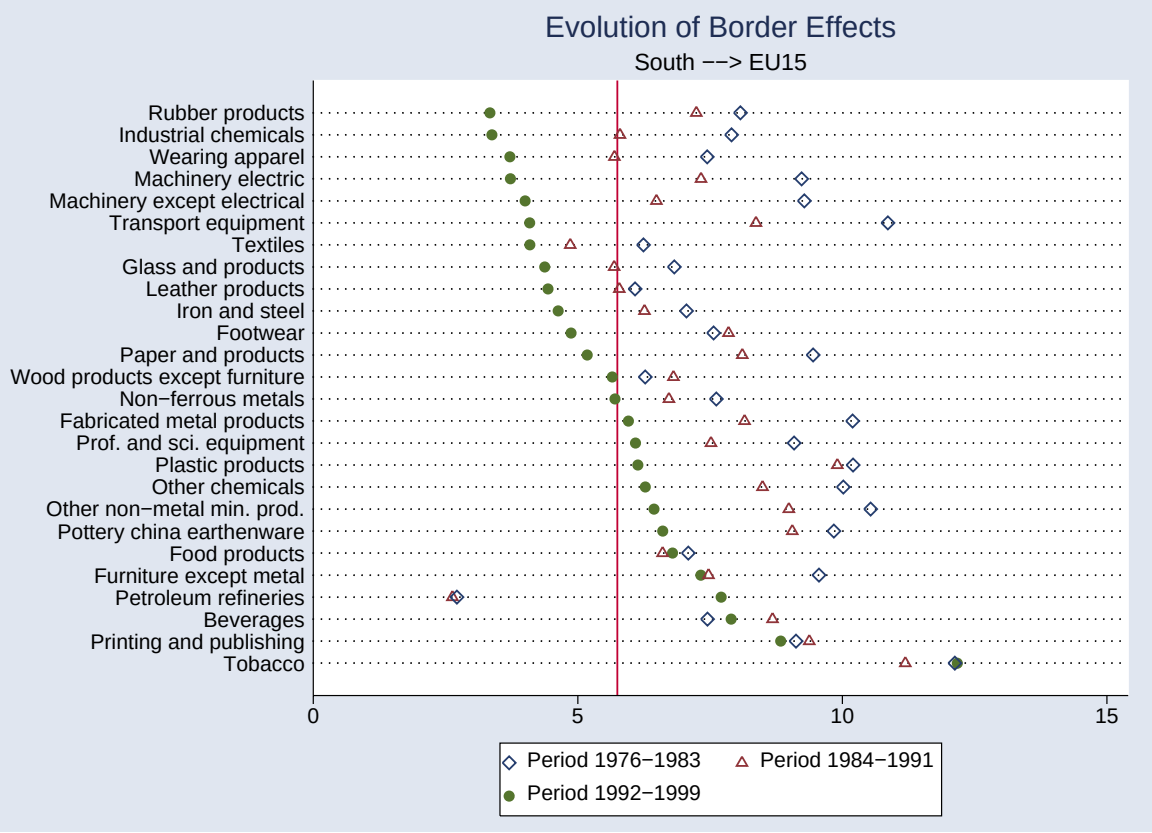


Figure 4: Evolution of Market Access South → US-Canada

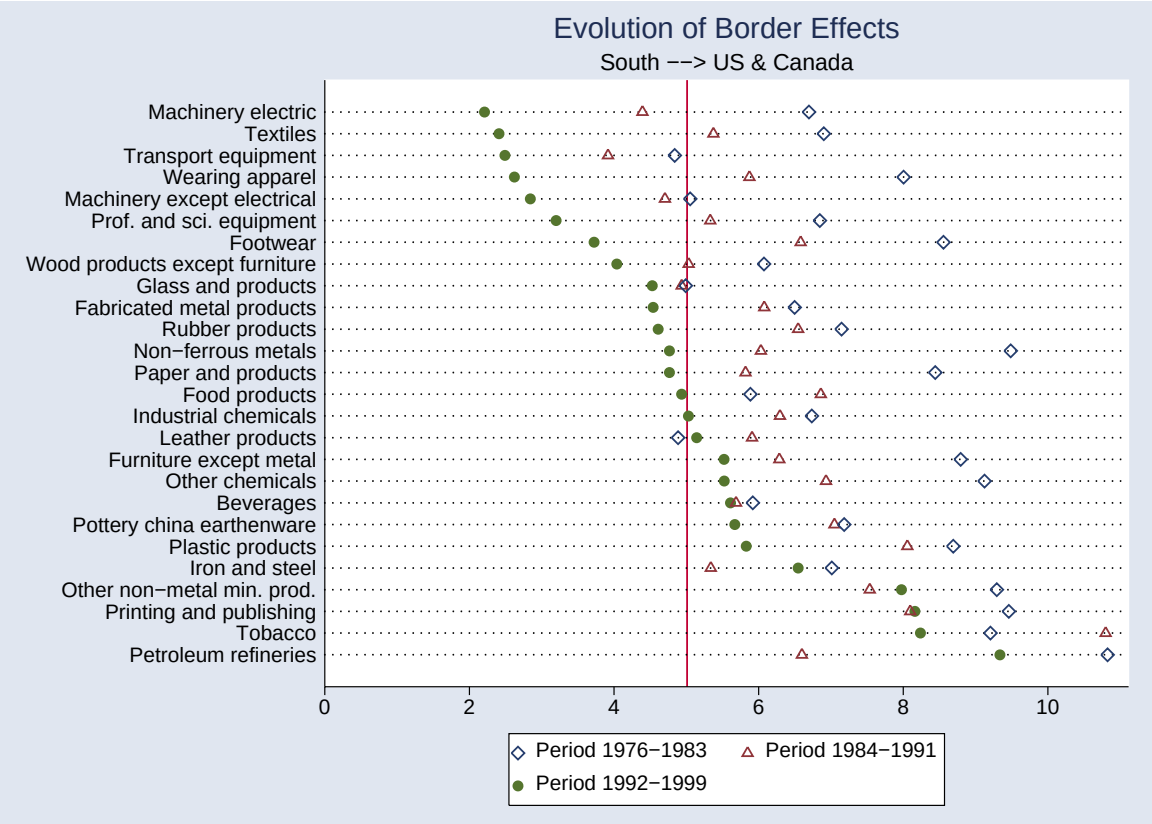
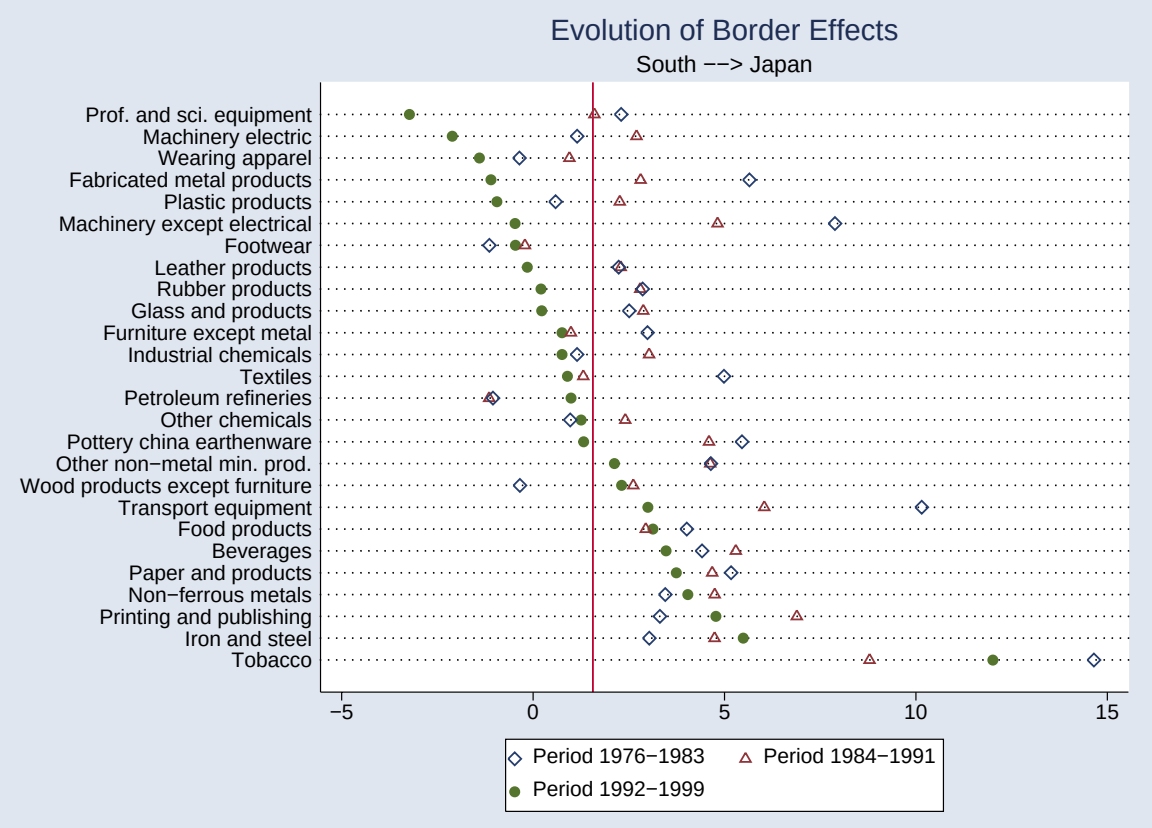


Figure 5: Evolution of Market Access South → Japan



trade patterns grounded in theory to estimate the impact of national borders on revealed access to Northern markets by Southern producers. Results reveal that difficulties faced by developing countries' exporters in accessing developed countries consumers is substantially higher than difficulties faced by Northern exporters. Currently, the tariff equivalents of those border effects differ by a figure up to 50 percentage points.

Those considerable difficulties in market access have however experienced a noticeable fall since the mid seventies. Another of our results concerns the impact of tariffs on market access. While tariffs still have in general an influence on trade patterns, they do not seem to be an important part of the border effect faced by Southern exporters on Northern markets. We also show that the use of the border effect methodology and the proximity of the empirical specification with theory changes the estimates related to the impact of regional agreements and put them more in line with our expectations than some results in the literature. The EU, CUSA/NAFTA, ASEAN/AFTA and MERCOSUR agreements all tend to reduce the estimated degree of market fragmentation within those zones, with an expected ranking between the respective impact of those agreements. Further research should concentrate on the provision of explanations of estimated restrictions in market access and in particular on disentangling actual protection from differences in preferences among consumers in rich and poor countries. While we do account for relative prices of products in our specification, an additional improvement of our framework would be to deal more fully with the respective specialization patterns of developing and developed countries, incorporating comparative advantage in the model.

6 References

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A Countries in the sample

Table 7: Country Pair observations in the North→North column of Table 2.

Exporter	AUS	AUT	BEL	CAN	CHE	DEU	DNK	ESP	FIN	FRA	GBR	GRC	HKG	IRL	ISL	ITA	JPN	NLD	NOR	NZL	PRT	SGP	SVN	SWE	USA	TOT
AUS	.	16	32	84	6	83	56	86	16	81	87	75	9	67	4	83	87	55	68	6	73	37	4	16	88	1219
AUT	82	.	56	151	20	147	119	156	.	149	155	134	20	107	14	152	156	89	116	18	149	54	13	25	153	2235
BEL	83	.	.	147	20	141	115	150	.	143	149	129	20	111	16	147	150	87	107	15	144	51	13	21	147	2106
CAN	77	24	57	.	11	147	115	155	26	149	155	130	20	113	15	151	155	90	116	18	147	54	13	24	156	2118
CHE	25	.	17	49	.	43	41	47	.	43	47	41	2	35	7	46	47	25	38	10	46	15	3	12	47	686
DEU	86	.	57	152	20	.	119	154	.	147	153	133	20	112	16	151	154	88	113	18	148	54	13	24	153	2085
DNK	86	.	57	154	20	147	.	156	.	149	155	135	20	113	16	153	156	90	116	18	150	54	12	25	156	2138
ESP	85	.	57	154	20	147	119	.	.	149	155	134	20	112	16	153	154	90	116	18	150	54	13	24	156	2096
FIN	78	.	54	147	20	147	119	152	.	147	153	126	19	104	16	149	151	89	116	18	142	54	12	25	152	2190
FRA	83	.	54	150	19	143	118	152	.	.	151	131	20	110	15	149	152	86	114	18	146	50	13	24	152	2050
GBR	87	.	57	154	20	147	121	156	.	149	.	135	20	114	16	153	156	90	116	18	150	54	13	25	156	2107
GRC	84	.	51	137	19	135	109	143	.	137	143	.	19	101	9	141	131	85	101	17	127	48	13	21	144	1915
HKG	67	22	44	137	11	128	97	133	22	135	138	104	.	95	10	133	139	74	103	16	120	48	10	22	139	1947
IRL	80	.	56	143	19	135	113	138	.	138	143	123	16	.	12	139	142	84	110	18	131	51	11	21	144	1967
ISL	10	.	13	32	6	54	39	39	.	47	59	22	4	25	.	31	47	32	51	11	33	2	.	18	56	631
ISR	48	23	34	78	15	84	73	87	23	85	89	82	11	66	6	86	88	54	76	18	82	41	3	23	92	1367
ITA	87	.	54	154	20	144	118	153	.	146	152	132	20	111	16	.	153	87	116	18	145	53	13	25	156	2073
JPN	87	24	57	154	10	147	116	152	25	147	154	130	20	109	13	151	.	89	115	18	145	54	13	25	156	2111
KWT	5	.	3	3	1	11	6	9	.	14	20	6	.	6	.	14	11	6	2	1	2	.	.	.	19	139
NLD	85	.	52	145	20	137	115	146	.	139	146	132	20	111	15	143	146	.	109	18	140	50	13	24	146	2052
NOR	78	.	51	142	19	135	111	144	.	139	143	115	17	103	16	141	141	78	.	16	140	51	12	22	144	1958
NZL	6	8	10	18	3	27	23	26	9	27	27	17	3	21	2	24	27	18	26	.	19	22	.	9	27	399
PRT	82	.	53	145	20	142	112	149	.	144	149	128	19	106	15	147	137	85	114	17	.	54	11	24	151	2004
SGP	74	22	53	75	11	140	102	141	23	142	150	118	19	97	6	143	149	86	106	18	115	.	8	22	150	1970
SVN	42	22	24	61	9	92	71	92	21	89	96	74	11	52	1	96	79	51	74	10	73	12	.	21	96	1269
SWE	87	.	57	154	20	147	121	156	.	148	155	134	20	108	16	152	156	90	116	18	148	54	13	.	156	2226
USA	87	24	57	154	11	147	121	156	26	149	155	135	20	114	16	153	156	90	116	18	150	54	13	25	.	2147
TOT	1781	185	1167	3074	390	3097	2489	3228	191	3132	3279	2755	409	2323	304	3181	3220	1888	2471	407	3015	1125	255	547	3292	47205

Table 8: Country Pair observations in the South→North column of Table 2.

Exporter	AUS	AUT	BEL	CAN	CHE	DEU	DNK	ESP	FIN	FRA	GBR	IRL	ITA	JPN	NLD	NOR	NZL	PRT	SWE	USA	TOT
AGO	.	.	.	.	.	3	1	5	.	5	6	3	6	1	3	1	1	6	3	7	51
ARG	54	19	34	91	14	100	49	106	15	99	103	50	101	99	61	70	18	85	22	106	1296
BEN	.	1	6	2	.	5	1	9	1	15	7	4	10	4	4	.	.	4	.	11	84
BGD	9	.	6	.	.	17	11	13	.	16	21	5	19	18	9	.	.	8	.	.	152
BOL	26	6	9	73	4	94	25	85	8	76	72	9	82	65	29	25	2	30	8	129	857
BRA	57	16	37	94	16	87	76	93	18	90	93	68	90	93	58	66	15	90	17	93	1267
CAF	.	1	.	.	.	.	.	.	.	1	.	1	1	.	1	1	.	1	.	1	8
CHL	71	21	39	134	12	136	72	142	14	131	134	75	136	115	70	74	15	97	21	154	1663
CHN	81	23	57	143	20	136	110	144	24	138	144	107	141	145	89	107	17	135	23	145	1929
CIV	9	3	12	19	2	25	7	19	1	37	30	22	32	13	14	6	2	18	3	40	314
CMR	9	6	17	53	3	49	9	52	6	81	51	13	47	41	32	5	.	16	3	82	575
COL	63	14	33	137	7	134	45	138	15	131	136	47	138	110	70	55	11	77	13	154	1528
CRI	36	14	22	129	11	103	41	102	10	106	106	53	96	91	46	55	1	55	14	154	1245
ECU	42	5	29	99	4	106	30	94	9	92	91	31	91	63	49	47	9	70	15	129	1105
EGY	54	23	33	90	12	98	52	97	18	96	101	54	97	84	56	79	9	70	21	103	1247
ETH	13	5	2	23	2	50	4	24	2	42	65	3	58	28	23	11	.	9	9	77	450
FJI	10	3	.	.	.	5	.	3	1	2	8	1	2	8	1	1	.	.	2	23	70
GAB	.	1	3	.	.	4	1	9	.	16	11	1	7	4	8	3	.	3	2	13	86
GHA	10	6	4	4	.	32	17	14	2	15	37	9	18	13	18	7	.	5	7	34	252
GTM	24	10	11	57	.	58	19	51	11	44	45	22	49	38	28	30	1	31	12	77	618
HND	7	6	9	25	2	41	12	42	6	35	35	11	22	24	17	17	1	11	7	75	405
IDN	70	22	47	127	17	136	105	136	23	135	143	95	134	146	79	105	18	116	23	146	1823
IND	87	22	55	77	20	147	114	151	24	149	155	103	150	156	90	111	18	145	23	156	1953
IRN	23	20	10	34	9	60	23	46	16	56	60	21	52	56	29	46	11	25	22	25	644
JOR	40	6	24	84	3	95	20	72	6	90	113	28	96	40	41	13	7	36	8	121	943
KEN	51	12	29	57	6	103	53	66	12	104	142	59	110	106	70	53	9	47	15	140	1244
KHM	.	3	.	2	.	2	1	2	2	3	1	2	2	6	.	2	.	1	1	2	32
KOR	77	24	57	151	11	147	107	152	24	148	153	99	148	154	88	109	18	142	23	156	1988
LBN	9	.	8	16	.	15	10	14	.	19	18	1	17	7	7	10	.	8	.	19	178
LKA	67	19	35	88	13	112	75	98	17	115	120	55	103	116	67	79	17	61	19	117	1393
MAR	59	20	50	129	10	136	72	145	17	144	142	82	140	107	76	81	6	126	17	140	1699
MEX	86	23	56	154	11	147	.	156	24	145	150	102	148	156	90	110	18	140	24	156	1896
MNG	.	.	2	.	1	4	.	2	.	4	5	1	2	6	.	2	.	.	.	5	34
MOZ	5	4	6	5	.	20	6	12	.	18	26	10	30	12	15	9	1	42	2	38	261
MWI	6	1	7	12	.	19	13	10	1	15	27	8	14	5	13	4	.	15	1	26	197
MYS	44	21	46	74	20	121	83	121	22	120	129	80	120	129	74	90	18	110	21	130	1573
NER	2	2	.	12	2	7	1	6	.	15	1	6	7	9	3	.	1	5	2	18	99
NGA	6	7	10	10	2	45	10	29	3	44	55	17	46	19	29	15	1	24	5	56	433
NPL	17	9	7	7	4	28	9	22	8	26	25	10	23	21	12	30	10	16	7	41	332
PAK	15	.	9	23	8	24	15	20	.	25	24	15	22	23	12	19	7	17	.	26	304
PAN	17	4	5	71	4	51	13	69	3	43	71	11	55	54	41	27	1	24	2	114	680
PER	15	.	18	22	9	46	14	44	.	39	42	14	43	39	21	21	5	31	.	51	474
PHL	52	22	32	80	15	81	62	79	23	79	85	57	74	85	49	70	18	71	21	85	1140
RWA	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
SEN	16	.	16	62	1	41	9	51	.	80	57	12	57	40	29	9	.	42	.	53	575
SLE	.	4	.	.	.	.	.	1	4	1	1	.	1	2	1	4	1	1	11	9	41
SLV	23	14	2	68	6	67	13	60	5	49	57	11	42	28	21	22	1	32	13	95	629
SYR	12	2	7	20	1	26	12	20	1	23	20	8	26	10	15	15	3	10	4	23	258
THA	47	23	20	66	5	62	50	61	26	63	66	45	62	67	36	79	14	60	25	93	970
TUN	45	16	41	87	12	112	35	111	11	118	103	44	118	77	50	57	2	82	13	111	1245
TUR	77	24	57	141	11	147	116	150	24	149	154	100	149	147	89	109	17	141	23	156	1981
TZA	26	.	19	25	6	57	18	31	.	46	61	25	51	36	31	26	2	16	.	55	531
URY	39	13	17	84	9	97	25	94	10	89	86	28	92	70	39	34	1	49	14	115	1005
VEN	26	15	15	76	6	79	.	82	10	69	74	17	80	55	37	34	7	64	15	86	847
ZMB	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	11	12
ZWE	30	11	19	26	6	69	30	47	9	52	73	34	52	40	36	30	9	30	14	73	690
TOT	1664	546	1089	3063	337	3587	1696	3402	486	3543	3735	1789	3509	3081	1976	2086	343	2550	570	4255	43307

Table 9: Country Pair observations in the North→South column of Table 2.

Importer	AUS	AUT	BEL	CAN	CHE	DEU	DNK	ESP	FIN	FRA	GBR	IRL	ITA	JPN	NLD	NOR	NZL	PRT	SWE	USA	TOT
ARG	33	62	61	63	29	67	64	67	58	66	68	53	66	64	66	57	9	60	65	68	1146
BOL	23	61	64	71	29	82	55	82	42	82	74	27	82	80	64	29	3	28	70	86	1134
BRA	30	50	56	52	19	57	51	57	50	57	57	52	55	54	57	44	.	53	57	57	965
CHL	67	121	115	126	36	125	120	127	114	123	130	90	125	125	121	108	9	114	124	130	2150
CHN	38	69	65	72	31	71	68	70	68	70	72	56	70	72	66	62	8	64	69	72	1233
CIV	2	9	11	10	5	10	11	11	4	12	12	9	12	9	12	8	2	9	7	12	177
CMR	2	12	16	13	6	16	16	14	9	18	17	10	16	14	14	9	.	10	14	16	242
COL	50	112	107	120	36	123	113	127	91	121	127	75	127	120	112	81	4	93	114	128	1981
CRI	17	42	47	48	6	50	43	50	35	49	50	32	50	47	47	30	.	37	45	52	777
ECU	27	80	85	95	34	97	80	97	66	96	98	48	98	93	85	46	2	60	88	102	1477
EGY	18	43	47	43	17	51	42	50	38	49	51	35	48	45	45	31	4	36	46	51	790
ETH	4	12	21	16	10	22	19	17	10	20	22	10	19	20	21	15	.	7	19	22	306
GAB	.	1	7	3	4	8	2	9	.	11	10	2	7	5	10	3	.	5	1	8	96
GTM	11	39	43	47	16	51	35	50	32	46	48	18	47	46	44	23	6	27	41	51	721
HND	1	10	14	15	8	16	12	16	6	15	15	8	14	16	14	4	2	5	12	17	220
IDN	53	83	84	87	32	88	86	91	74	85	90	57	88	91	83	70	18	60	79	91	1490
IND	47	68	66	70	29	71	70	70	60	69	74	56	72	73	66	60	8	57	70	74	1230
JOR	6	14	17	15	.	16	15	16	12	17	17	11	17	14	17	10	.	10	15	17	256
KEN	52	65	71	70	35	85	80	72	65	81	90	52	84	83	85	52	18	41	72	86	1339
KOR	70	103	96	103	43	103	102	101	100	98	104	80	98	104	97	93	27	87	103	104	1816
LKA	37	47	51	48	26	62	58	54	46	58	65	32	60	61	58	38	18	24	53	64	960
MAR	26	80	85	85	45	91	82	93	69	91	94	60	94	79	87	60	8	87	86	94	1496
MEX	66	109	101	60	34	113	.	112	100	111	113	90	110	109	104	86	13	100	109	61	1701
MWI	1	5	7	8	5	12	10	9	4	11	12	5	11	11	13	4	2	9	7	13	159
MYS	77	102	99	109	53	107	109	109	102	108	109	88	109	109	101	95	32	87	107	109	1921
NPL	2	2	4	5	3	12	5	5	2	9	10	2	5	12	7	2	1	.	2	8	98
PAN	8	19	24	27	4	27	21	29	13	28	28	10	28	27	27	14	.	15	21	29	399
PER	15	21	21	26	13	26	26	25	20	24	25	13	23	25	23	14	9	16	24	26	415
PHL	45	49	47	53	28	56	47	58	42	56	59	38	58	59	54	38	24	31	53	59	954
SLV	7	35	39	42	19	57	30	56	24	47	47	16	52	47	44	15	2	23	35	58	695
THA	38	47	43	47	22	48	49	48	44	48	49	37	49	49	47	41	18	37	49	49	859
TUN	15	53	57	45	18	58	43	56	40	57	58	31	55	44	54	30	2	52	52	58	878
TUR	35	75	68	74	41	76	76	73	71	75	78	64	76	75	73	66	10	70	74	78	1328
TZA	9	12	17	15	2	19	18	16	12	16	20	7	18	16	16	15	.	8	16	19	271
URY	44	102	105	109	45	118	104	118	81	119	118	59	117	113	113	55	11	83	109	123	1846
VEN	35	73	73	82	42	83	.	85	68	81	85	54	81	80	80	67	12	79	77	85	1322
TOT	1011	1887	1934	1974	825	2174	1762	2140	1672	2124	2196	1387	2141	2091	2027	1475	282	1584	1985	2177	34848

Table 10: Country Pair observations in the South→South column of Table 2-Part1.

Exporter	ALB	ARG	BLR	BOL	BRA	CHL	CHN	CIV	CMR	COL	CRI	CZE	ECU	EGY	EST	ETH	GAB	GTM	HND	HUN	IDN	IND	JOR	KAZ	KEN	KGZ
AGO	.	.	.	.	.	.	3	.	.	1	.	.	.	.	.	.	.	.	.	2	.	.	.	.	2	.
ALB	.	.	.	.	.	.	3	.	.	3	.	8	11	5	.	.	.	.	.	16	5	.	.	.	.	.
ARG	.	.	3	61	42	42	36	4	2	42	19	22	61	19	4	.	1	35	15	51	38	19	.	.	9	.
AZE	.	1	.	.	.	1	3	.	.	2	.	2	.	9	3	.	.	.	.	7	2	1	1	.	.	8
BDI	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
BEN	.	1	.	.	.	.	2	1	1	7	.	.	2	1	.	.	.	.	.	2	2	1	.	.	.	.
BGD	.	4	.	1	2	7	8	.	1	9	.	.	.	3	.	1	.	1	.	11	4	25	.	.	3	.
BGR	3	33	17	2	20	25	40	4	.	27	8	39	11	40	12	7	.	5	.	105	35	30	12	7	5	8
BOL	.	60	.	.	45	109	3	.	1	64	18	1	58	2	.	.	.	4	.	10	7	4	1	.	.	.
BRA	1	39	3	63	.	57	49	7	8	75	26	30	73	29	4	4	2	35	13	85	51	46	.	.	21	.
CAF	.	.	.	.	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.
CHL	.	68	.	85	54	.	48	2	1	123	47	15	101	12	4	.	.	48	13	42	59	31	5	.	1	.
CHN	2	59	9	72	49	117	.	9	14	114	45	42	90	45	10	18	3	38	13	108	82	65	14	7	80	24
CIV	.	1	.	.	3	.	4	.	11	7	.	.	5	3	2	8	8	.	.	6	17	2	.	.	2	.
CMR	.	3	.	4	5	3	4	5	.	4	7	5	2	3	1	.	9	.	.	11	11	5	.	.	2	.
COL	.	60	.	82	52	125	29	4	4	.	51	14	100	10	2	.	1	49	15	37	18	26	1	.	2	.
CRI	.	37	.	38	37	73	13	1	2	116	.	12	79	.	1	1	.	50	16	49	15	8	1	.	.	.
CZE	4	96	46	63	94	87	87	5	14	111	47	.	94	40	25	20	.	38	9	160	101	61	12	8	37	28
ECU	.	52	.	73	37	94	10	.	.	103	31	8	.	2	6	.	.	44	10	29	42	7	.	.	.	.
EGY	2	30	.	27	18	36	37	4	8	40	2	19	24	.	1	20	1	2	1	64	40	21	.	2	24	.
EST	.	12	15	3	6	12	12	.	.	15	3	25	11	5	.	.	.	1	.	42	10	5	.	4	1	4
ETH	.	1	.	3	2	.	8	.	1	1	.	3	.	3	.	.	.	.	.	4	19	6	1	.	18	.
FJI	.	.	.	.	.	.	2	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
GAB	.	.	.	.	.	.	1	.	.	3	.	.	.	1	.	.	.	1	.	1	.	.	.	.	1	.
GHA	.	1	.	3	.	.	7	.	.	.	.	.	.	2	.	9	.	.	.	2	2	.	.	.	2	.
GTM	.	32	.	25	7	40	29	.	1	51	17	.	44	1	.	.	.	.	17	7	15	.	.	.	.	.
HND	.	2	.	6	.	2	.	.	.	14	.	.	4	.	1	.	.	25	.	10	9	.	.	.	.	.
HUN	4	44	18	13	46	81	49	5	6	62	17	42	36	36	14	6	1	9	2	.	49	47	9	8	29	8
IDN	.	47	.	28	41	87	56	9	4	82	35	39	54	44	10	15	6	27	2	80	.	53	15	.	49	1
IND	1	57	8	45	54	118	69	9	13	104	40	41	72	46	9	21	2	35	10	106	89	.	17	.	88	13
IRN	.	7	.	1	.	2	22	1	.	2	.	10	.	5	3	8	.	2	.	45	23	6	.	.	15	7
JAM	.	.	.	.	.	1	.	.	.	1	.	.	.	.	.	.	.	.	.	2	.	.	.	.	.	.
JOR	.	1	.	8	3	12	19	.	1	8	5	5	12	35	.	8	1	4	.	18	35	33	.	.	14	.
KAZ	.	1	.	.	.	7	15	.	.	.	.	4	.	9	.	.	.	.	.	5	1	2	.	.	.	4
KEN	.	15	.	6	3	16	17	2	1	13	1	5	4	12	.	20	.	1	.	31	29	33	2	.	.	.
KGZ	.	2	5	.	.	.	10	.	.	.	.	6	.	3	1	.	.	.	.	3	8	3	.	5	.	.
KHM	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.
KOR	.	64	11	77	57	123	72	9	13	118	44	40	92	46	11	18	6	48	13	104	90	70	15	6	71	15
LBN	.	3	.	1	6	6	9	.	.	2	.	.	2	19	.	.	.	.	.	.	.	.	.	.	.	.
LKA	.	26	.	11	22	41	51	1	3	19	6	16	17	27	2	3	.	3	.	64	43	66	.	.	13	.
LTU	.	10	18	2	5	13	27	.	1	22	6	35	4	4	13	.	.	.	.	74	7	8	1	5	.	19
LVA	.	10	22	4	6	10	13	.	.	2	1	28	.	4	17	.	.	.	.	61	2	6	1	5	1	9
MAR	.	33	.	5	16	42	13	11	9	33	18	20	11	26	1	2	6	9	1	53	16	16	6	.	8	.
MDA	1	.	.	3	.	5	8	.	.	14	.	12	20	1	5	.	.	.	.	31	.	3	1	.	.	4
MEX	.	67	.	79	55	126	64	4	5	123	51	38	96	35	2	2	.	50	17	86	75	54	11	.	12	.
MKD	.	.	7	.	.	.	.	.	.	.	.	16	.	11	.	.	.	.	.	14	.	.	.	.	.	.
MNG	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	1	.	.	.	.	.	.
MOZ	.	4	.	4	1	2	17	.	.	1	.	1	.	1	.	3	.	.	.	13	14	2	.	.	11	.
MWI	.	2	.	.	.	.	1	1	1	2	.	1	.	6	.	2	.	.	.	8	4	.	.	.	9	.
MYS	1	54	1	29	53	87	71	6	10	71	23	39	48	41	4	9	2	22	5	100	75	66	.	.	26	3
NER	.	.	.	.	1	.	2	1	.	.	.	.	.	.	.	.	.	.	.	3	1	2	.	.	.	.
NGA	.	.	.	3	.	2	2	7	.	.	.	2	1	3	.	13	.	.	1	9	7	3	.	.	24	.
NPL	.	5	.	.	.	5	11	.	.	.	.	4	.	.	.	.	.	.	.	10	.	.	.	.	.	.
PAK	.	.	.	.	.	11	.	3	.	5	.	12	.	.	.	.	.	.	.	19	19	10	.	.	31	.
PAN	.	40	.	67	36	87	28	.	.	91	40	4	78	1	1	.	.	19	.	16	18	3	1	.	.	.
PER	.	.	.	.	.	25	.	1	.	25	.	3	.	.	2	1	.	19	11	20	11	5	.	.	.	.
PHL	.	41	.	9	25	41	53	2	1	30	5	15	21	20	3	3	.	7	1	63	52	35	.	.	9	.
POL	1	47	22	19	40	82	58	6	7	77	21	44	51	33	17	10	.	14	3	116	50	46	9	3	26	15
ROM	2	32	6	2	17	29	35	1	1	29	5	23	17	18	3	4	.	6	1	86	17	26	.	.	10	1
RUS	2	57	.	24	39	68	68	5	4	71	22	46	50	36	17	18	.	13	5	111	58	57	8	8	20	27
SEN	.	2	.	.	8	2	5	10	8	3	3	3	3	5	.	3	.	.	.	7	16	4	1	.	4	.
SLE	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	10	.	.	.	.	.	.
SLV	.	16	.	20	7	25	12	.	.	35	16	.	33	2	.	.	.	49	17	19	2	.	.	.	.	.
SVK	2	7	20	4	45	26	23	.	1	53	7	44	44	25	11	4	.	4	1	66	10	28	.	7	.	8
SYR	1	9	.	.	2	9	12	1	.	3	.	4	.	10	.	1	.	.	.	17	8	2	.	.	.	.
THA	.	31	3	12	10	38	36	6	.	21	14	11	21	12	2	.	.	10	.	35	45	.	6	3	34	9
TJK	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	5	.	.	.	.
TKM	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.
TUN	1	12	.	1	9	11	11	7	6	21	1	9	4	24	1	2	5	1	.	45	38	11	6	.	6	.
TUR	4	53	18	24	42	90	62	8	10	77	32	41	35	49	10	16	5	17	.	113	66	61	17	7	36	25
TZA	.	1	.	6	1	7	10	.	1	4	.	4	.	11	.	5	.	2	.	13	27	16	.	.	.	.
UKR	1	22	.	4	.	23	42	.	5	23	9	45	.	27	16	.	.	.	.	90	16	31	.	.	.	4
URY	.	47	.	66	56	93	24	1	1	62	21	8	64	9	.	.	1	27	3	23	16	27	.	.	4	.
VEN	.	42	.	48	23	54	19	3	1	60	7	2	58	1	.	.	.	32	13	10	21	10	.	.	.	.
YEM	.	.	.	.	.	.	5	.	.	.	.	1	.	3	.	5	.	.	.	.	11	.	.	.	.	.
ZAF	.	57	.	43	53	119	63	11	15	81	25	35	66	39	4	19	7	17	3	83	54	53	11	2	64	2
ZMB	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.
ZWE	.	.	.	.	.	1	4	4	.	.	.	3	.	2	1	11	.	.	.	8	16	4	.	.	42	.
TOT	33	1560	252	1279	1255	2458	1630	181	197	2383	796	1007	1784	976	256	320	67	823	231	2756	1724	1270	185	87	866	246

Table 11: Country Pair observations in the South→South column of Table 2-Part2.

Exporter	KOR	LKA	LTU	LVA	MAR	MDA	MEX	MWI	MYS	NPL	PAN	PER	PHL	POL	ROM	RUS	SLV	THA	TKM	TUN	TUR	TZA	UKR	URY	VEN	ZAF	TOT
AGO	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	9
ALB	2	.	.	.	.	.	.	.	3	.	.	.	.	1	.	1	.	8	.	.	16	.	.	.	1	4	87
ARG	45	19	4	4	36	.	49	3	54	1	10	25	27	26	5	8	33	14	.	16	42	1	2	53	43	72	1117
AZE	5	.	4	6	.	2	.	.	2	.	.	.	.	8	2	20	.	1	.	2	29	.	.	1	.	9	131
BDI	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
BEN	3	.	.	.	2	.	3	1	4	.	.	.	.	1	1	.	.	1	.	.	1	.	.	.	.	6	43
BGD	24	3	.	.	1	.	28	.	23	.	.	2	5	10	.	21	.	6	.	1	9	.	.	8	1	12	234
BGR	43	22	16	25	46	20	52	.	67	.	2	6	7	64	10	21	6	32	.	28	68	3	22	34	19	72	1180
BOL	16	.	.	.	2	.	45	.	4	.	7	22	2	.	.	1	.	2	.	.	5	.	.	55	45	28	621
BRA	69	29	4	14	61	.	52	6	56	1	14	17	39	43	9	16	40	13	.	38	44	5	.	55	60	77	1483
CAF	.	.	.	.	1	.	1	.	2	.	.	.	.	2	.	.	.	.	.	.	1	.	.	.	.	1	11
CHL	69	18	2	10	18	.	91	1	62	.	26	26	24	16	3	8	49	25	.	11	20	.	2	119	84	76	1519
CHN	97	57	13	25	83	6	78	4	106	12	26	23	56	81	10	22	49	46	1	51	68	17	21	104	48	95	2328
CIV	7	1	.	.	18	.	11	1	24	.	.	.	5	8	.	3	1	10	.	2	4	.	.	1	.	34	209
CMR	12	.	.	.	19	.	24	.	15	.	.	2	1	8	1	1	.	9	.	5	3	.	.	2	5	45	236
COL	46	10	.	1	23	1	92	3	24	.	28	25	8	13	6	4	50	18	.	2	21	1	.	80	85	45	1268
CRI	45	6	.	.	23	.	66	.	17	.	29	15	10	9	2	2	57	14	.	4	12	.	.	41	66	25	992
CZE	97	54	40	47	106	30	129	.	95	4	6	28	32	111	22	48	33	37	.	80	110	3	48	89	51	124	2711
ECU	44	3	1	4	14	.	66	.	30	.	17	25	4	9	1	6	29	11	.	.	15	.	.	49	78	77	1031
EGY	48	18	1	8	61	.	42	1	61	1	1	7	9	27	.	19	.	14	.	37	54	13	10	27	30	65	977
EST	17	2	16	22	11	11	22	.	7	.	6	3	1	24	4	17	2	4	.	4	15	.	17	10	4	20	425
ETH	9	1	.	.	2	.	53	.	8	.	.	1	1	.	2	.	.	1	.	4	8	1	.	.	.	25	186
FJI	1	2	.	.	.	.	1	.	9	.	.	.	.	7	.	.	.	4	.	.	.	.	.	.	.	.	27
GAB	2	.	.	.	2	.	4	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3	21
GHA	10	4	.	.	3	.	7	.	5	.	.	.	2	1	.	.	.	8	.	4	3	.	.	.	.	19	94
GTM	16	2	1	1	2	.	74	.	2	.	20	15	1	1	.	1	58	6	.	1	6	1	.	26	57	17	594
HND	20	5	.	.	5	.	25	.	2	.	.	3	4	3	.	.	16	8	.	.	1	.	.	6	14	19	204
HUN	72	18	19	27	51	17	78	2	60	1	9	14	21	84	12	22	12	33	.	33	67	2	21	49	29	81	1475
IDN	99	51	4	7	57	3	87	7	95	7	15	20	55	64	8	9	14	46	.	40	56	12	1	73	52	82	1748
IND	101	63	6	20	82	5	102	12	108	8	21	20	55	69	11	24	21	48	.	44	72	20	17	105	69	101	2271
IRN	31	25	.	1	21	.	9	.	63	.	.	2	4	32	.	.	.	26	.	3	32	.	.	3	5	35	451
JAM	.	.	.	.	.	.	2	.	3	.	.	.	.	1	.	.	.	2	.	.	.	.	.	.	11	.	23
JOR	33	26	.	.	51	3	10	.	60	1	.	1	5	11	7	7	.	18	.	22	35	3	4	1	9	43	572
KAZ	12	.	4	2	1	2	5	.	.	.	1	.	.	5	3	7	1	.	.	1	4	.	.	.	.	1	97
KEN	39	20	.	.	4	.	26	12	43	.	.	.	8	9	.	1	.	31	.	5	17	20	.	8	4	86	544
KGZ	4	.	1	2	.	2	.	.	7	.	.	.	.	1	.	14	.	8	.	.	10	.	.	.	.	17	112
KHM	.	2	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	6
KOR	.	61	11	24	83	3	108	11	108	10	24	24	58	79	10	24	43	48	.	42	72	16	18	103	77	98	2388
LBN	.	.	.	.	.	.	4	.	.	.	3	.	.	.	.	.	.	.	.	7	.	5	.	2	3	.	72
LKA	84	.	2	2	16	.	62	3	81	1	2	6	31	13	4	10	5	23	.	4	25	2	.	21	4	76	911
LTU	28	8	.	25	14	13	18	.	2	.	7	1	2	47	7	23	1	7	.	2	33	.	24	2	5	41	584
LVA	21	1	19	.	2	12	4	.	9	.	2	1	2	35	5	19	.	.	.	3	19	.	18	1	1	13	389
MAR	36	4	1	2	.	.	61	.	23	.	3	2	7	17	2	7	4	14	.	52	40	1	3	44	25	75	778
MDA	2	.	6	17	.	.	.	.	1	.	1	1	.	7	10	20	2	1	.	.	14	.	2	1	.	13	206
MEX	99	29	3	6	58	1	.	1	84	.	28	25	41	40	9	22	57	39	.	28	59	3	4	115	83	92	1978
MKD	7	.	.	.	.	7	5	.	.	.	.	.	.	15	.	3	.	.	.	.	40	.	.	.	.	.	125
MNG	5	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	7
MOZ	1	2	.	.	3	.	3	6	17	.	.	.	9	1	.	.	.	9	.	.	3	1	.	1	1	65	196
MWI	1	.	.	.	2	.	3	.	3	.	.	1	2	2	.	.	.	1	.	1	2	3	.	.	.	49	107
MYS	98	63	3	8	61	3	85	7	.	.	8	18	56	49	9	23	19	39	.	33	66	13	15	68	51	97	1738
NER	4	3	.	.	2	.	.	.	11	.	.	.	.	4	.	.	.	4	.	.	1	.	.	.	.	17	56
NGA	19	2	.	2	7	.	3	6	11	.	.	.	2	9	.	.	.	16	.	.	1	.	.	2	10	34	201
NPL	11	8	.	.	.	.	1	.	12	.	.	.	1	7	.	.	.	9	.	.	3	.	.	.	.	16	103
PAK	42	.	.	1	.	.	6	8	32	.	.	.	23	16	.	.	.	15	.	.	.	.	.	10	8	19	290
PAN	24	3	.	6	6	1	78	.	24	.	.	.	9	6	3	10	30	10	.	2	15	.	.	66	46	33	902
PER	45	5	.	1	3	1	30	.	18	.	.	.	9	11	.	.	7	13	.	1	2	.	.	23	48	18	358
PHL	74	42	.	9	24	.	55	2	103	2	4	15	.	23	.	18	2	41	.	4	55	2	2	50	42	64	1069
POL	78	26	20	28	63	18	83	1	77	3	11	10	22	.	12	22	11	34	.	40	62	4	23	64	46	85	1660
ROM	30	18	7	7	31	5	26	2	31	1	5	3	13	42	.	11	1	12	.	21	44	1	11	34	14	36	777
RUS	88	38	21	31	71	20	72	.	56	5	9	15	9	63	11	.	10	19	1	40	74	5	25	46	43	82	1688
SEN	15	.	.	.	10	.	3	.	3	.	.	1	.	2	1	1	.	1	.	6	2	.	.	.	.	38	170
SLE	.	.	.	.	.	.	.	.	4	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	16
SLV	16	4	.	.	1	.	59	.	4	.	18	10	1	3	.	1	.	3	.	.	9	.	.	10	29	13	434
SVK	41	1	19	30	24	6	24	.	11	.	3	5	4	64	11	23	8	.	.	29	54	1	24	26	14	56	918
SYR	3	2	1	2	13	.	4	.	8	.	2	.	1	8	.	5	.	3	.	2	17	1	.	4	15	4	174
THA	14	43	.	6	36	1	35	5	81	13	14	.	57	44	.	.	6	.	.	9	43	10	.	11	4	38	829
TJK	1	.	.	.	.	.	.	.	.	.	.	.	.	1	.	2	.	1	.	.	.	.	.	.	.	.	11
TKM	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
TUN	22	1	.	.	73	.	7	.	26	.	3	1	1	14	4	7	.	8	.	.	23	3	2	8	10	38	483
TUR	83	32	17	26	74	20	92	2	90	.	14	14	28	79	12	24	10	36	1	58	.	11	24	80	47	96	1888
TZA	14	4	.	.	1	.	15	7	12	.	.	.	4	5	1	.	.	6	.	3	4	.	.	.	1	56	241
UKR	43	.	19	30	51	13	36	.	34	.	.	3	4	59	10	24	.	11	.	14	66	.	.	10	5	74	864
URY	39	1	2	.	7	.	73	.	11	.	6	21	8	15	2	5	9	6	.	4	17	.	1	.	60	51	891
VEN	34	4	.	1	11	.	63	.	29	.	7	26	11	9	.	5	35	19	.	1	15	1	1	61	.	34	771
YEM	3	2	.	.	3	.	.	.	5	.	.	.	.	2	.	.	.	1	.	1	2	.	.	.	.	.	44
ZAF	91	54	3	9	47	3	89	13	90	.	12	18	35	58	10	18	11	40	.	31	62	19	11	103	58	.	1811
ZMB	.	2	.	.	.	.	.	.	1	.	.	.	1	1	.	.	.	1	.	.	.	.	.	.	.	15	22
ZWE	14	5	.	.	5	.	9	14	24	1	.	1	4	3	.	.	.	11	.	2	3	.	.	.	.	50	242
TOT	2368	929	290	499	1608	229	2550	141	2260	72	424	524	841	1602	252	630	742	1005	3	878	1795	204	373	1965	1620	3005	51431