Truly Preferential Treatment? Reconsidering the Generalized System of (Trade) Preferences

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Abstract

Empirical research focusing on preferential treatment for developing economies have not considered how preferential margins might influence market access particularly when competing non-members might be receiving preferential benefit of their own with a common trade partner. In this paper, we compute two indices (based on existing studies) to measure bilateral trade restrictions by considering product line tariff restrictions and the product line market participants. One index captures the restrictions bilateral tariff rates impose on market access conditions of a country as compared to the most favored nation rate, called Exponential Trade Restrictiveness Index (ETRI). The other index captures the relative ease with which a country can access foreign markets compared to its competing suppliers, called Exponential Relative Preferential Margin (ERPM). Second, we use these two bilateral indices in a gravity framework to re-evaluate the Generalized System of Preferences (GSP) in terms of relative preferences. The results show that the GSP programs do not improve the direct market accessibility but they do improve the relative market accessibility of low-income countries.

Keywords: Relative Preferential Margin, Trade Restrictiveness Index, PTAs, Generalized System of Preferences

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1. Introduction

For more than fifty years, starting from 1948, World Trade Organization (WTO) and its predecessor General Agreements on Tariffs and Trade (GATT) were cornerstones for multilateral trade and were generally accepted as engines to propel export-lead development. Over the turn of the century though, countries increasingly trade in bilateral and regional trade agreements. Trade economists and policy makers alike view these preferential trade agreements (PTAs) as specialized mechanisms tailored to provide market access to partner countries. Often, the PTAs provide significant tariff reductions compared to those negotiated through the multilateral process of the WTO, and also enforce complex rules of origin (RoO) which makes it costly for non-member countries to trade outside of PTAs (Egger and Larch 2008, Hoekman and Nicita 2011, Baldwin and Jaimovich 2012, Fugazza and Nicita 2013). This has lead to a marked increase in the way PTAs are shaping global trade: either countries join existing PTAs or form new PTAs with their trading partners. As of April, 2015, the WTO notifications show that there are 262 PTAs in operation.

The proliferation of PTAs has resulted in an important policy question: what is the true preferential margin a developing country enjoys? The traditional measure of the extent of the preferential margin is estimated by comparing the tariff rate offered to a recipients as compared to multilateral (i.e., most favored nation (MFN)) rates agreed to under the auspices of the World Trade Organization (WTO). While this may still be important for some products and markets, the explosion of PTAs over the last two decades means that relative preferences matter because competing suppliers, including developed countries, likely enjoy some preferential treatment of their own in a given

import market (Francois et al. 2006, Inama 2006, Fugazza and Nicita 2013). Intuitively, the preferential treatment under a PTA may not be as rewarding as intended because other countries capable of exporting similar or highly substitutable products may enjoy a preferential program of their own. Thus, preference erosion, when measured relative to competing suppliers, likely has important implications for the trade-facilitating impacts of the GSP for developing economies.

Viner (1950) opened the discussion about the effects of PTAs (custom unions) on international trade claiming membership in trade-diverting custom unions shifted the "locus" of imports and thus production from non-member countries to a high-cost member country. This finding, which countered the intended goal of trade led welfare-improvement, was later re-evaluated in partial and general equilibrium settings by Lipsey (1957) and Bhagwati (1971), respectively. These later theoretical studies, agree that even trade-diverting custom unions could be welfare enhancing. Follow-up studies, of which there are many, also take a theoretical approach in evaluating the effects of PTAs for members and non-members (see for e.g., (Kemp and Wan 1976, Grossman 1995, Krishna 1998, Ornelas 2005).

More recently, an increasing number of studies on the effect of PTAs are devoted to measuring the extent to which preferential treatment impacts recipients' trading volumes. While many theoretical studies predicted large and positive effect of PTAs, empirical research has produced mixed evidence, especially in the case of Generalized System of Trade Preferences (see for e.g., Rose 2004, Hoekman and Ozden 2005, Gamberoni 2007, Limão 2007, Subramanian and Wei 2007, Herz and Wagner 2011). Initially, due in part to the product-specific eligibility for preferential treatment under

GSP, program administration was complicated for recipient nations. Further, eligible products were frequently not produced or not significant sectors for the recipient nations and many of these studies use total merchandise trade statistics which may mask important preferential benefits in some product lines.

For example, Herz and Wagner (2011) cast considerable doubt on the benefits of GSP by using dummy variables in a gravity-based framework applied to total merchandise trade. Other assessments of the GSP program have focused on program utilization rate (Carpenter and Lendle 2010) and compliance cost (MacPhee and Rosenbaum 1989, Devault 1996, Grossman and Sykes 2005, Reynolds 2005). Similar to Herz and Wagner (2011) in these studies consideration of GSP is simplified in that all products from a participating country are assumed to benefit from the GSP rather than the relatively smaller subset of product lines actually eligible for preferential treatment. An exception to this is a working paper by (Cirera et al. 2011) which includes product line considerations in evaluating a single donor's GSP program (EU) over a limited time period (6 years; 2002-2008). In this case, the authors report that GSP offers only a limited trade creation benefit.

The above empirical research, however, does not consider how GSP membership might influence market accessibility when competing non-member suppliers are likely receiving preferential treatment of their own in a common import market. The purpose of this paper is to re-evaluate the performance of GSP in terms of its effect on the relative preferences and thus on the relative market accessibility it provides to developing-country members. First, we modify the Tariff Trade Restrictiveness (TTRI) Index and the Relative Preferential Margin (RPM) by making use of the exponential function which

assigns greater weight (i.e., penalty) to larger preferential differences to measure bilateral trade restrictions by considering product line tariff restrictions and the product line market participants. The Exponential Trade Restrictiveness (ETRI) Index captures the restrictions bilateral tariff rates impose on market access as compared to the most favored nation rate. This index is built on the theoretical foundation provided in (Anderson and Neary 1996, 2003) and later adopted in empirical analysis by Kee et al. (2009) and Fugazza and Nicita (2013). The Exponential Relative Preferential Margin (ERPM) captures the relative ease with which a country can access foreign markets compared to its competing suppliers. Development of this index is motivated by Fugazza and Nicita (2013); Cirera et al. (2011); Carrère et al. (2010); and Low et al. (2005). Second, we use these two bilateral indices alongside the GSP indicator variable in a gravity framework to re-evaluate the performance of the GSP for developing countries.

This paper is not the first to compute the direct and relative trade restrictiveness indices, however, this paper improves on the existing indices to capture more detrimental protectionist policy better and penalizing them more. Simultaneously, these indices maintain the importance the former versions attached to economically important goods. Taking feedbacks from existing literature (Grossman 1995, Subramanian and Wei 2007, Grant and Boys 2012), these indices are computed for agricultural and non-agricultural goods separately which allows one to compare the possibly differential impact the relative preferential margin have on these sectors. This paper also contributes to the literature on preferential margin by investigating the relative market access conditions GSP provides to agricultural and non-agricultural trade.

2. Preferential Margins and Market Accessibility

2.1. Preferential Margins and their Measurement

Countries may discriminate amongst trade partners by enforcing different tariff rates for otherwise similar products. The number of different tariff rates that are applied to few agricultural products, by the European Union and Canada, in the year 2000 is plotted in Fig.1. By way of example, for fresh cut flowers and buds, Canada has at least 5 different levels of tariff rates applied to otherwise similar products depending upon the source of supply.

The fact that countries face different tariff rates in the same destination market has important implications on the *relative* competitiveness and ability of countries to access international markets. Consider the case of Mexico, which is a major exporter of sunflower oil to the United States and which also receives preferential tariff reduction into the US market. Mexico's production efficiency coupled with the preferential tariff for this product might enable Mexico to be price competitive with domestic producers in US. Can it be concluded than that Mexico has a high level of market access to the US sunflower oil market? What if competing suppliers like Canada and Turkey also receive preferential tariff benefits from the United States that are sufficiently generous that, in practice, Mexico cannot compete against imports from these suppliers? These types of questions can be explored using the proposed indices. More precisely, the TTRI will answer the question of to what extent a country experiences a market restriction (improvement) when facing bilateral tariffs (tariff reduction). Then, ERPM will permit the effect of preferential treatment for an exporting country to be assessed relatively to the treatment of its competing country suppliers.

2.2. Measurement of Exponential Trade Restrictiveness Index (ETRI)

Anderson and Neary (1994) introduced the concept of trade restrictiveness index (TRI) but it is easy to find few variations of this index in subsequent literature (Feenstra 1995, Anderson and Neary 2003, Kee et al. 2009, Fugazza and Nicita 2013). The original version by Anderson and Neary is a general equilibrium application of the trade expenditure function, difference between the expenditure and the production function, in welfare context of the importing country. A solution to minimizing this distance function gives rise to their TRI. As such, the original TRI is the uniform tariff which under the protectionist regime maintains the welfare level in the importing country at the original level by keeping total exports (regardless of exporting countries) to the country constant (before and after the application of protectionist policy). In addition to introducing the TRI, Anderson and Neary (1996) applied their index using Computable General Equilibrium (CGE) model to data for Colombia for the year 1989-90. Further, with an example of US textiles imports from Hong-Kong for period of five years, they indicate the TRI can be applied in partial equilibrium setting under the separability assumption (trade policies do not affect the prices of non-traded goods and that the traded goods can be separated from others in computing the distance function).

Later empirical adoptions computed TRI from the perspective of an exporting country Feenstra (1995), Kee et al. (2009),Fugazza and Nicita (2013). Feenstra (1995) shows that ignoring general equilibrium effects, one can construct the indices using the weighted square of tariffs rates at the product line level. Kee et al. (2009) computed three different version of the TRI, one of these answers the trade restrictions from exporter's perspective. (Fugazza and Nicita 2013) adopt this later version of Kee, et al. (2009) in their empirical estimation, which is explained below. All these versions of TRI are partial

equilibrium simplification of the original version. Implicit in this simplifications and unlike in computable general equilibrium (CGE) models, only the direct impact of tariffs are captured, thus abstracting away from any income or cross-price substitution effects.

In construction of TRI, there are mainly two aggregation challenges - aggregating different policy measures, and aggregating products of different economic importance. The overall trade restrictiveness (OTRI) index constructed in Kee et al. (2009) and the tariff trade restrictiveness (TTRI) index proposed by (Fugazza and Nicita 2013) address these issues by using import shares to weight the effective tariff rates. These weights are then scaled using import elasticities to reflect that some products might be more (less) responsive to changes in tariffs, and that these products should be given more (less) weight in calculating a trade restrictiveness index. The TTRI/OTRI faced by country i in exporting to country j proposed by these authors is:

$$TTRI_{ij} = \frac{\sum_{hs} X_{ij,hs} * \varepsilon_{j,hs} * T_{ij,hs}}{\sum_{hs} X_{ij,hs} * \varepsilon_{j,hs}} \qquad (1)$$

where $X_{ij,hs}$ are exports, ε is the import demand elasticity, T is the applied tariff, and hs is the product denoted at the Hs-6 digit level; subscripts for time are suppressed here for ease of notation.

This index specification is problematic, however, in that it considers two countries equally trade restricted if they face similar average trade weighted tariff rates, ceteris paribus. For example, a country may enforce relatively low tariff rates for all goods except one which is set perniciously high. A TRI specification such as that in Equation 1 masks this outlier which in practice might be quite detrimental to a particular

country's exporting ability. Therefore, we propose a variant of this index that penalizes tariff rates that are more distant from the standard MFN rate:

$$ETRI_{ij} = \frac{1}{k}\left(\sum_{hs} exp\left(\frac{mfn_{j,hs} - T_{ij,hs}}{mfn_{j,hs}}\right) * weights_{ij,hs}\right)$$
$$weights_{ij,hs} = \frac{X_{ij,hs} * \varepsilon_{j,hs}}{\sum_{hs} X_{ij,hs} * \varepsilon_{j,hs}} \quad \textbf{(2)}$$

where exp is an exponential function, k is the total number of products country i exports to country j, and mfn is the most favored nation (MFN) rate offered under the auspices of WTO. Other notations are as above.

Holding other factors fixed, use of the exponential function offers the advantage that this index is non-decreasing in the tariff restrictions faced by a country which seeks to export into a country employing protectionist measures. For example, if the two tariff rates are similar, but one of them is too high compared to its MFN rate, then the ETRI penalizes this later tariff rate more because the use of exponential function ensures that ETRI score in this later case is smaller which means the restriction is higher. Further, the use of import shares and import elasticities in the weights ensure that good that is not traded or is not economically important is not wrongly penalized by the use of exponential function. Country pairs differ in number of products they trade with each other. In scaling with the number of traded products, the index is made invariant to trade intensity. In absence of such a scaling factor, bilateral trading pairs that trade a large number of products might show lower restriction score; this endogeneity issue will be further explored below.

Another interesting property of the exponential function is that it has clear upper and lower bound which, in this application, facilitates comparisons across bilateral pairs.

This specification limits ETRI scores to the interval of [0, e~2.72]. A score of 1 would indicate that the tariff structure the importer enforces is not different from WTO standard rates. A score of below (above) one means the country faces relatively higher (lower) restriction in a given market than it would face under the WTO regime. As a tariff rate approaches infinity, the discrepancy between the MFN rate and the tariff rate approaches negative infinity and the score is zero.

2.3. Measurement of Exponential Relative Preferential Margin (ERPM)

Empirical studies have shown that preferential margin relative to MFN rate overestimates the benefits of preferential tariff (Carrère et al. 2010, Hoekman and Nicita 2011, Fugazza and Nicita 2013). As argued in the previous section, given the web of PTAs, the actual extent of 'preference' a country experiences depends, in part, upon the extent of preferences available to its competitors in the same destination market; a preferentially treated exporter might not benefit from the trade agreement, if competing suppliers receive even lower or duty free treatment in the same market. Fugazza and Nicita (2013) were the first to formalize this concept of RPM. Their RPM is as follows:

$$RPM_{ij} = \frac{\sum_{hs} X_{vj,hs} * \varepsilon_{j,hs} * (T^{w}_{j,hs} - T_{ij,hs})}{\sum_{hs} X_{vj,hs}}, i \neq j$$
$$T^{w}_{j,hs} = \frac{\sum_{v} X_{vj,hs} * T^{v}_{j,hs}}{\sum_{v} X_{vj,hs}}, v \neq i \qquad (3)$$

Where, v denotes competing exporters with country i to destination country j, $T^{w}_{j,hs}$ is trade weighted average tariff applied to imports from each country v, and other notations are as above. As above, the trade-weighted average tariff applied to imports from all

other countries $(T^{w}_{j,hs})$ would be upper-biased if there were more countries trading the same product with the partner j which in turn would under estimate the relative preferential margin for exporter i in the import market j. Equally likely is the fact that the relative preferential margin is upper estimated because if a country traded more goods with the partner *j* then the RPM score as measured above would increase. These are the limitations associated with the functional form of the index. Motivated to address these limitations, we propose the following variant of the above RPM:

$$ERPM_{ij} = \frac{1}{k}\left(\sum_{hs} exp\left(\frac{T^{w}_{j,hs} - T_{ij,hs}}{T^{w}_{j,hs}}\right) * weights_{ij,hs}\right), i \neq j$$
$$T^{w}_{j,hs} = \frac{1}{N}\frac{\sum_{v} X_{vj,hs} * T^{v}_{j,hs}}{\sum_{v} X_{vj,hs}}, v \neq i \qquad \textbf{(4)}$$

where, N is the number of actual suppliers of the product to the country j, all other notations are as previously described. Scaling the trade weighted average tariff of all other countries $(T^{w}_{j,hs})$ by the number of suppliers removes the upper bias in estimating this weighted tariff. Further, averaging the weighted exponential tariff difference for each good by the total number of goods exported lessens the bias associated with the trade intensity.

In addition to differences in the functional form and the scaling factor, our index differs from Fugazza and Nicita's index in the treatment of market participants. Fugazza and Nicita (2013) use the basket of goods an exporter ships to a given market and create a counterfactual scenario where these goods are exported by all other countries in the world to determine the trade weighted average tariff rates for competitors. Instead, here we use

the actual international market participants for each product to compute this trade weighted average tariff.

The lower the average tariff rates a country faces in destination market compared to the average weighted tariff rates faced by all other competing market participants, the greater the preferential margin the exporter receives and the higher its relative preferential margin in that market. As with the ETRI, the value of ERPM also varies in the interval of [0, e~2.72]. A score of 1 would indicate that, on an average, the tariff structure the importer faces is not different from what its foreign competitors face in the given market. A score of above (below) 1, indicates a larger (smaller) relative preferential margin as compared to competitors, which means the country has a greater (lesser) ability to access a given market than its foreign counterparts.

3.1 Empirical Estimation of the Indices

While the proposed indices offer several advantages over existing indices, they are not without some limitations. Both ETRI and ERPM use import elasticities for HS-6 digit products. In practice elasticities are unobservable and have to either be estimated before computing the indices or be retrieved from existing sources. In either case, elasticities would be estimated with some confidence interval around them. Therefore, we use the elasticities estimated by Kee et al. (2008) to construct our index. As such, our indices which include elasticities in weights then will also have some errors.

Further, as these indices are separately computed for each year, the calculated index value might change simply because the trade weights change year to year. To address this endogeneity problem, Fugazza and Nicita (2013) used a fixed value of trade weights (average trade of 1995-1997) for each year in their sample. This approach,

however, introduces a new problem. Over a large span of time, changes in taste, preferences, technology, or regulation may impact the consumption, and thus the economic importance of some products. Using fixed weights would mask such changes and contradict the rationale for using weights in the first place. To address this issue, we propose to use a three-year moving average trade weights (i.e. in calculating trade weights for year t, we average trade values over the years t, t-1, and t+1) instead of using any fixed trade weights. Further, weighted indicators tend to produce higher relative preferential margin score and higher trade restrictiveness score when countries trade intensely in less protected products because, by construction, larger trade get larger trade weights (see for e.g., Fugazza and Nicita, 2013). By averaging the sum of ETRI/ERPM score of each product by the total number of products traded in a bilateral trade relationship, we soften this endogeneity issue to some extent.

3.2. Empirical Estimation of the GSP effect

Based on the framework of Dixit-Stiglitz (1977) and Anderson and Van Wincoop (2003), a standard gravity model is applied to assess the impact of GSP on trade flows. Using a standard derivation approach, this framework yields to following structural equation:

$$X_{ijs} = \alpha_{ijs} * \tau_{ijs}^{1-\sigma} * \left(\frac{Y_{is.} E_{js}}{\Omega_{is} Q_{js}^{1-\sigma}} \right) \qquad (5)$$

where, X_{ijs} is expenditure of country j on all the products belonging to sector s that are imported from country i, α_{ijs} is a preference parameter for all the products in the sector supplied by country i to country j, τ_{ijs} is the sectorial composite price faced by

consumers in country j (it includes all trade costs such as freight cost and tariff) for the goods imported from country i, Y_{is} is the sectorial exports from country i, E_{js} is the expenditure on all products belonging to the sector s in country j regardless of where the products originate, Q_{js} is the composite price index of all the goods belonging to sector s in country j, and Ω_{is} is the outward multilateral resistance which measures real market potential for country i's export of all its products belonging to the sector s. E_{js}, which is a function of price index, in practice is not observable and is assumed to be a function of total income in country j, (i.e $E_{js} = GDP_j^{\beta_1}$). Assuming a homothetic utility function, the coefficient on GDP can be shown to equal one for total merchandise trade; for sectoral analysis this is not necessarily the case because the associated sub-utility function need not be homothetic. Similarly, $GDP_i^{\beta_2}$ can be used, as a proxy for Y_{is}. X_{ijs} is replaced with the value of exports from country i to country j. The relative preferential margin and trade restrictiveness index proposed in Anderson Van Wincoop's (2003) structural gravity equation can also be adopted in a specification for sector-level trade.

Ω_{is} can be written as a function of price index as faced by consumers in each importing country, expenditure of each importing partner on goods from country i, and bilateral trade cost faced by the exporter i with each partner. Data on each of these variables is not available in practice. In the original AvW model, this term is designated to capture the effect the outside world has on trade between two countries. In other words, this term measures the real market potential for country i's export. The price index, Q_{js}, is a function of producer's price in each exporting country augmented by all the trade

costs in shipping to destination j. Thus the functional form Q_{js} assumes in the structural gravity equation makes tariff costs non-separable from other costs. In the general equilibrium model by AvW, these two terms (frictions) would jointly shape the bilateral trade. However, if we ignore the general equilibrium feedback (i.e. frictions in exporting to outside world does not affect the frictions in bilateral trade) but take into account only the more direct cost of trade barrier (i.e the trade barrier the partner applies on all other exporters), then we can use the ERPM to proxy this resistance term, i.e $Q_{js} = ERPM_{ijs}^{\beta_1}$. β_1 need not be equal to one, because ERPM is estimated focusing on tariff restrictions, whereas the former term is comprehensive of all tariff and non-tariff restrictions. ETRI can more easily proxy τ_{ijs} i.e $\tau_{ijs} = ETRI_{ijs}^{\beta_2}$ where the parameter need not equal $(1-\sigma)$ because the ETRI is computed with respect to MFN rate and do not fully cover all the tariff related trade costs. Further, since the trade basket varies across countries, TRIs do not fully account for the more general tariff component in Anderson and Van Wincoop model.

Our empirical model consists of panel gravity model and various fixed effects to fully account for multilateral resistance term; here time subscript is suppressed to ease the notation. Anderson and Van Wincoop (2003), Baldwin and Taglioni (2006) and Feenstra (2003) suggest using time-varying-country fixed effects to control for the multilateral resistance term. As described above, in partial equilibrium simplification (abstracting away from general equilibrium feedbacks) we use ERPM and ETRI to control for the multilateral resistance term. However, these terms do not fully take into account non-tariff related trade costs. Therefore, we supplement these proxies with country-specific

fixed effects. While the time-varying country specific fixed effects would have been the first choice to control for non-tariff related heterogeneity, considering the relatively short period of time (2000-2009) in our sample and any substantial change in international policy would require longer time period, we use country-specific fixed effects, and time fixed effects separately. Further, we include a discrete variable to denote GSP status for the exporter, and an interaction term to capture the effect of ERPM on GSP. Then, the gravity model assumes the following form, which is estimated for agriculture and non-agriculture sector separately. Also, note that the ETRI and ERPM are estimated separately for agriculture and non-agriculture sector. Then, the dependent variable is the aggregate of all products in respective sector.

$$\ln X_{ijt} = \mu_j + \phi_i + \alpha_t + \beta_1 \ln GDP_{jt} + \beta_2 \ln GDP_{it} + \beta_3 ERPM_{ijt} + \beta_4 ETRI_{ijt}) + \beta_5 GSPstatus_{ijt} + \lambda_1 \left(GSPstatus_{ijt} * ERPM \right) + \varepsilon_{ijt} \quad \textbf{(6)}$$

where μ_j is importer-time varying effect, ϕ_i is exporter-time varying effect, α_t is time-fixed effect, $GSPstatus$ is an indicator variable indicating if the exporter i receives preferential treatment from its trade partner j in the year t, and ε_{ijt} is the stochastic error term for the sector.

4. Data

The dataset consists of bilateral trade flows, tariffs and import demand elasticities. The trade data is obtained from United Nation's COMTRADE database and is at HS-6 digit level. The tariff data originates from World Integrated Trade Solution's (WITS) TRAINS database and is at HS-6 digit level. The data on import demand elasticity is retrieved from Kee et al. (2009) and is also at HS-6 digit level. GSP status is compiled from individual

handbooks on GSP schemes, UNCTAD Newsletters, and WTO website. GDP data is from World Bank World Development Indicators database. Gravity variables are from CEPII's database. Data is available for the year 2000 to 2009. Table 1 provides the list of countries used in this research.

5. Results

5.1. ETRI and ERPM

Figure 2 plots the level of ETRI in 2009 against the level of ETRI in 2000 for agricultural and non-agricultural sectors. The clustering follows a distinct pattern for ETRI score of above and below 1. For example, for values above 1 (higher the score lower is the restriction), the clustering is clearly above the 45-degree line indicating the agricultural markets have been liberalized during the sample period. This means the exporters who were either facing liberal or neutral (average tariff rates similar to the MFN rates) policy in the agricultural markets have received further liberalization in the agriculture sector. Importantly, for ETRI score of below 1, the clustering is again above the 45-degree line indicating that the exporters facing protectionist policy have further increased in number during the sample period. This structural change in tariff regime over the ten year period may not be as limiting, if some of these changes are offset by increase in relative preferential margin.

In non-agriculture sector, though, the clustering is basically around the 45-degree line indicating there has not been much change in the ETRI score. This means most of the exporters face similar average relative (to MFN) tariff through out the sample period in non-agricultural goods. However, around the ETRI score of 1, the clustering is above the 45-degree line which implies that the exporters facing neutral policy in 2000 have moved

on to receive more liberal average tariff reduction (as compared to MFN rate) during the sample period.

The distribution of bilateral ERPM for the first and the last year of the sample are shown in Fig.3.a for five major agricultural import markets. Here, we compare the relative preferential margins exporters faced in these agricultural markets in year 2009 to the relative preferential margin the exporters faced in the same markets in the year 2000. In the EU market, the distribution of the ERPM for the year 2009 is more tightly centered around 1 than for the former year, and peaks on 0.8. Whereas for the year 2000, most part of the distribution curve is located right to 1 and peaks at 0.6. This indicates that EU preference has shifted from being more preferential (higher preferential margin) and more discriminatory (providing preferential benefits to lesser number of countries) to being less preferential and less discriminatory in the agriculture sector. In general, the Australian preferential system remains less discriminatory and more preferential in agriculture sector for the entire sample period. The same can be said for the Canadian and Japanese preferential system for agriculture sector. A common feature in these agricultural markets, except for EU, is the exporters face more preferential and less discriminatory agriculture tariff structure by the end of the sampling period than at the start. More precisely, the exporters with higher market accessibility in the first year of the sample faced further liberalization during the sample period. Those left out in the initial waves of liberalization, were penalized compared to their foreign competitors. However, this number of penalized partners has declined over the years. For example, in 2000 almost 50 percent of the exporters faced relative preferential margin of less than 1 (i.e faced higher trade weighted tariff rates compared to their competing foreign exporters) in

the US agricultural market, but as of 2009, this number has gone down to being less than 20 percent.

The change in the ERPM exporters faced in non-agricultural markets in year 2009 compared to the year 2000 is presented in Fig.3.b. Unlike in the agriculture sector, in non-agriculture sector ERPM tend to approach the bounds and is no more centerd around 1. This means, the exporters facing slightly higher average trade weighted tariffs compared to their competitors are likely to face severe market restrictions while the countries receiving slightly lower tariff rates on an average are likely to face highly liberalized market in non-agriculture sector. Given that the non-agriculture sector, which primarily consists of processed and manufactured goods face higher trade weighted tariff when we consider the total basket of goods traded, these results are not surprising. The EU is exception to this rule: the EU preferential has become less discriminatory and less preferential as opposed to the trend in agriculture sector.

This evidence of changing market accessibility and evolving preferential trade agreements point toward to the need for an economic research to explore how the interaction of these market conditions affect the extent of trade liberalization offered by any particular preferential trade agreement. The importance of this has been hypothesized in a handful of theoretical studies (Kee et al., 2013; Fugazza and Nicita, 2013; Carrere et al., 2010), including work by Wonnacott and Wonnacott (1981) who claim that although non-reciprocal preferential trade agreements reduce the cost for an importer by reducing its tariff, they do not necessarily provide the much needed foreign market access to the exporter.

5.2. GSP

The Generalized System of Preferences was established in 1971. Currently, 43 industrialized countries provide GSP treatment to more than 200 states and territories (United Nations Conference on Trade and Development (UNCTAD), 2008). There are few more in the implementation stage. Importantly, exporting member countries vary in the extent to which they utilize the GSP preferential regime. Fig 4. Shows the share of agricultural exports to GSP importers in total agricultural exports for 13 least developed countries for the year 2009. For example, Benin shipped 2.5 percent of its total agricultural shipment (in value terms) to countries providing GSP preferential treatment where as Côte d'Ivoire shipped about 75 percent of its exports to GSP partners in the year 2009. The figure for Benin is even low when we consider the number of GSP partners (5) it traded with compared to its total trade partners (14) for agricultural goods. While the number of GSP partners is the same for Côte d'Ivoire, in general it exported its products to total of 25 countries in the year 2009. Both of these countries receive GSP preferential treatment from the United States and the European Union. These later group, serve as attractive market for agricultural products, but are also stricter in quality terms. Additionally, each have carefully selected list of sensitive items that are not included in the preferential treatment, and for beneficiary country this comes as a challenge to recognize and utilize the market access available which might even strengthen the competition form similar exporters. Uganda, Tanzania, Malawi, Madagascar are some other countries that export about 50 or more percent of its agricultural products to GSP partners which in value terms ranges from US $ 1 to 8 billion. Out of these 13 countries, 9 countries exported agricultural products to the United States in 2009. These 9 countries, as indicated by trade restrictiveness index, and relative preferential margin, mostly face a

restricted market access to the United States agricultural Market when compared to their developed counterparts. Among these countries, Mozambique and Togo (with ERPM ~ 1) are the only likely countries to have similar access compared to more developed-competing agricultural suppliers.

5.3. Econometric Results

In this section we present and discuss the results derived from the gravity model estimation. The sensitivity of our results to the choice of the weights used in the construction of the indices is also explored.

5.3.1. Assessing the Impacts of the ERPM and ETRI on Trade

Table 2 reports the estimated coefficients with robust standard errors for series of specifications for non-agriculture sector. Standard gravity equation explanatory variables such as GDP, distance, contiguity, colonial relationship and common language take the expected sign and are significant. The coefficients on GDP, although not unitary as expected of non-homothetic sub-utility function, are positive and closer to one than zero, the trade flow decreases with the distance almost with unit elasticity, while sharing border, common language or having colonial ties increases the trade between partners, ceteris paribus.

The relative preferential margin and trade restrictiveness indices were both estimated to take a negative value. By construction, the higher the ETRI score lower is the trade restriction with respect to MFN rate and the higher the score on ERPM is, the higher is the preferential margin a country receives relative to its competitors. Thus, a negative sign on ETRI score indicates that as the score goes down, meaning as the restriction increases, the bilateral trade flows increase too. Specification in column (1)

with random effect, shows that each percentage point decrease in the ETRI increases the bilateral trade flows by 89 percentage. Similarly, a percentage increase in ERPM decreased the bilateral trade flows by almost 34 (exp(-.34)-1)*100) percentage Controlling for country specific heterogeneity in specification (2) and time and country fixed effects in specification (3), however, decreases the magnitude of these coefficients to minus 2.04 for ETRI, while the coefficient on ERPM do not vary significantly. The lower value for this variables may indicate the omitted variable issue and that the specification in (1) and (2) did not account for the full heterogeneity across countries.

Table 2 (column 4 to 6) reports the same for agriculture sector. While the standard gravity equation variable assume expected sign and are significant, the ETRI and the ERPM take negative sign and are significant too. The coefficients on these later variables as compared to non-agriculture sector are relatively low. For example, when controlling for the time heterogeneity, the results indicate that one percentage decrease in the trade restriction score (higher restriction), increases the bilateral trade flows by approximately 1.5 times while a percentage increase in the ERPM decreases the bilateral agricultural exports by about 60 percentage. Upon controlling for country specific effects in specification (5) and country and time heterogeneities in specification (6), these coefficients do not show much variation. For example, in the specification (6) the bilateral exports decreased to half with one percentage increase in ETRI. In the same specification, an increase in ERPM by one percentage point led to decrease in trade flows by about 48 percent.

5.3.2. Assessing Trade Facilitation Impacts of the GSP

We now investigate the effect of GSP on agricultural and non-agricultural trade flows. The results are presented in table 3. Column 1 to 3 shows the results for non-agriculture sector. In each of these specifications, the GSP variable takes a negative coefficient indicating that a membership in GSP actually hinders the export of non-agricultural goods. For example, membership in GSP resulted in, on an average, a decrease of export by about 13 percent. With progressive inclusion of time and country specific heterogeneities, the negative coefficient of the GSP variable further increases in magnitude. In the specification (3), where we control for both country and time varying heterogeneities, compared to non-members the member countries faced a decrease of export by about 33 percent annually.

Table 3 (column 4 to 6) reports the same for agriculture sector. In this case, when we do not control for probable time and country-time heterogeneities, the GSP variable is not significant. In specification (5) where we control for country specific heterogeneity, the GSP variable is significant and takes a coefficient of minus 0.57. Further, when we control for country specific and time varying heterogeneities in specification (6), the GSP variable takes a negative coefficient of similar magnitude. The result indicates that a GSP member country in our data set exported on average 43 percent less agricultural goods to its trade partner who offers GSP preferential treatment. These results are comparable to findings in Herz and Wagner (2011) who reported a decrease on total exports from GSP recipient by 22 percent in the long run. Hoekman and Ozden (2005), Ozden and Reinhardt (2005), and Panagariya (2003) are also among the studies that found negative impacts of GSP/non-reciprocal trade preferential agreements on exports from developing countries.

5.3.3. Assessing the Impacts of the GSP on Relative Preferences

Now we want to investigate how the membership in GSP, influences the market accessibility indices in the export of agricultural and non-agricultural goods. The results are provided in table 4. In column 1 to 3, we present the results for non-agriculture sector. The coefficient on interaction of GSP variable with the ERPM is of our primary concern. As can be seen, in each of the specification this interaction term has a positive sign and is significant. In specification (1) where we do not control for time and country-time varying heterogeneities, the interaction term has a magnitude of 2.08 with a positive sign. This indicates that in presence of GSP membership, one percentage point increase in ERPM can increase the exports of non-agricultural goods by almost 7 times. With the progressive inclusion of time and country specific heterogeneities the magnitude of the coefficient slightly decreases. For example, in specification (3) with country-time varying fixed effects, the interaction term takes a coefficient of 2.0. This means an increase of one percent in relative preferential margin for a GSP member country means, an increase in its bilateral exports to GSP providing country by 7 folds.

The effect of GSP membership and ERPM on agricultural trade flows is presented in the same table 4 (column 4 to 6). In the basic specification (4), the coefficient is positive 0.5.The coefficient does not change much with country and time heterogeneities controlled. For example in specification (6) where we control for time and country specific heterogeneities, the result indicate that for a GSP exporter, an increase in ERPM by one unit translates into increase of agricultural trade flows by 64 percent. It is difficult to validate these results using existing literature. To our knowledge, while studies on preferential margins and PTAs have investigated the impact of PTAs and relative

preferences on trades flows separately but have not investigated the impact of GSP and the relative preferences jointly.

We also investigated the sensitivity of our results to choice of our trade weights in constructing the indices. In all the above cases, the trade weights used are for the current year for which the indices are computed. To check the robustness of our results, we use the indices computed using three-year moving average trade weights. The results do not vary significantly.[1]

6. Discussion

While the existing indices to measure the trade restrictiveness and relative preferential margins have many useful properties, these indices assign equal score to countries if on an average the tariff structure they face is similar. However, a country's trade policy might not be innocuous even if it liberalizes all the products except one and this particular product happens to be an economically important trade item for the exporting country. Our index is designed to capture this type of masked protectionist policy if present. This is an important policy consideration because PTAs such as GSP have carefully selected list of sensitive items that are not eligible for preferential tariff benefits.

In the past, studies have cast reasonable doubts on the performance of GSP and have even suggested abolishing such agreements (Panagariya 2003, Özden and Reinhardt 2005, Herz and Wagner 2011). In those studies, however, the assessment of PTAs was often limited to the use of dummy variables. There is a little doubt dummy variable would capture different benefits the program offers to the members as opposed to the non-members. However, it is also important to take into account that only selected

[1] The results are not reported in separate table but are available upon request.

products and countries are eligible for receiving the GSP preferential benefits. The ERPM is constructed to capture this selective and relative benefits PTAs offer. The results suggest while the preferential trade agreements such as GSP do not improve the direct market accessibility but they do improve the relative market accessibility of low-income countries, precisely, for which the program is designed. This has a policy implication in that GSP is a contract based policy and the contract renewal is hugely debated in the United States. This finding would help ameliorate such policy debates as it offers extended evidences that the GSP fulfills on the promise to liberalize market for low- income countries.

7. Conclusion

The objective of this paper is to investigate how preferential margins relative to MFN rate and relative to competing exporters affect the bilateral trade flows. In meeting this objective, we first construct two bilateral indices. In construction of these indices we take into account the tariff restrictions at the product level and carefully identify the potential competing suppliers also at the product level. The use of exponential function in constructing these indices ensured that larger weight is associated to larger differences in relative tariff rates. The implication is that even if a country faces high protectionist policy in a single economically important export item, the protectionism it faces in the import market is recognized. In general, the market accessibility as indicated by ETRI has improved over the sample period and as indicated by ERPM, preferential trade agreements have become less discriminatory over time.

Further, we use these indices in gravity framework to investigate how the membership in GSP influences the ERPM and thus the bilateral exports. The results

although not clear on agriculture sector, show significant and positive impact of GSP on relative market accessibility on non-agricultural sector. The message is that membership in preferential agreement such as GSP influences relative market accessibility to increase the exports from low-income countries.

International policy changes are less frequent; this study uses data for the recent 10 years, which may not account for all the policy changes since the establishment of PTAs. It would be interesting and informative to see how the market accessibility for low-income countries has evolved in the past 25 or more years.

Table 1. List of Countries used in this Paper

Algeria	Guatemala	Philippines
Argentina	Honduras	Poland
Australia	Hungary	Portugal
Austria	Iceland	Rep. of Korea
Bangladesh	India	Romania
Belarus	Indonesia	Russian Federation
Belgium	Iran	Saudi Arabia
Benin	Ireland	Senegal
Bolivia (Plurinational State of)	Israel	Singapore
Brazil	Italy	Slovakia
Bulgaria	Jamaica	Slovenia
Cameroon	Japan	South Africa
Canada	Jordan	Spain
Chile	Kazakhstan	Sri Lanka
China	Kenya	Sweden
China, Hong Kong SAR	Latvia	Switzerland
Colombia	Lebanon	Thailand
Costa Rica	Lithuania	Togo
Croatia	Madagascar	Trinidad and Tobago
Czech Rep.	Malawi	Tunisia
Côte d'Ivoire	Malaysia	Turkey
Denmark	Mauritius	USA
Egypt	Mexico	Uganda
El Salvador	Morocco	United Arab Emirates
Estonia	Netherlands	United Kingdom
Ethiopia	New Zealand	United Rep. of Tanzania
Finland	Nicaragua	Uruguay
France	Nigeria	Venezuela
Gabon	Norway	Zambia
Germany	Oman	Zimbabwe
Ghana	Paraguay	
Greece	Peru	

Table 2. The effect of bilateral indices on bilateral trade flows in Agriculture and Non-Agriculture Sector

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Non-Agriculture Sector			Agriculture Sector		
Log of GDP of Exporter	1.234***	0.482***	0.545***	0.714***	0.357***	0.358***
	(0.018)	(0.061)	(0.079)	(0.017)	(0.045)	(0.058)
Log of GDP of Importer	0.898***	0.614***	0.652***	0.755***	0.758***	0.760***
	(0.015)	(0.056)	(0.078)	(0.018)	(0.045)	(0.070)
ETRI	-2.164***	-2.037***	-2.053***	-0.974***	-0.910***	-0.918***
	(0.138)	(0.139)	(0.140)	(0.057)	(0.057)	(0.057)
ERPM	-0.304*	-0.306*	-0.302*	-0.468***	-0.474***	-0.477***
	(0.172)	(0.169)	(0.170)	(0.064)	(0.064)	(0.064)
Log of Distance	-1.165***			-0.720***		
	(0.039)			(0.034)		
Contiguity	0.743***			1.537***		
	(0.188)			(0.144)		
Common Official Language	0.472***			0.811***		
	(0.094)			(0.099)		
Colony	0.442***			0.949***		
	(0.161)			(0.139)		
Observations	17,905	17,905	17,905	33,923	33,923	33,923
R-Squared	0.76	0.77	0.77	0.52	0.67	0.67
Year FE	Yes	No	Yes	Yes	No	Yes
Importer- FE	No	Yes	Yes	No	Yes	Yes
Exporter FE	No	Yes	Yes	No	Yes	Yes
Dependent Variable	Log of Aggregate Non- Ag. Exports			Log of Aggregate Ag. Exports		

Note: Robust Standard Errors in Parenthesis. *** p<0.01, ** p<0.05, * p<0.1

Table 3. The effect of GSP on bilateral trade flows in Agriculture and Non-Agriculture Sector

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Non-Agriculture Sector			Agriculture Sector		
Log of GDP of Exporter	1.229***	0.483***	0.546***	0.720***	0.355***	0.355***
	(0.018)	(0.061)	(0.079)	(0.018)	(0.045)	(0.058)
Log of GDP of Importer	0.904***	0.616***	0.655***	0.752***	0.761***	0.762***
	(0.015)	(0.056)	(0.078)	(0.018)	(0.045)	(0.070)
ETRI	-2.161***	-2.035***	-2.051***	-0.975***	-0.907***	-0.915***
	(0.138)	(0.139)	(0.140)	(0.057)	(0.057)	(0.057)
ERPM	-0.299*	-0.299*	-0.296*	-0.469***	-0.473***	-0.475***
	(0.172)	(0.169)	(0.170)	(0.064)	(0.064)	(0.064)
GSP Status as an Exporter	-0.138*	-0.420***	-0.407***	0.100	-0.569***	-0.573***
	(0.070)	(0.105)	(0.104)	(0.074)	(0.095)	(0.095)
Log of Distance	-1.160***			-0.725***		
	(0.039)			(0.035)		
Contiguity	0.734***			1.545***		
	(0.189)			(0.144)		
Common Official Language	0.465***			0.823***		
	(0.093)			(0.099)		
Colony	0.458***			0.927***		
	(0.163)			(0.139)		
Observations	17905	17905	17905	33,923	33,923	33,923
R-Squared	0.76	0.77	0.77	0.52	0.67	0.66
Year FE	Yes	No	Yes	Yes	No	Yes
Importer FE	No	Yes	Yes	No	Yes	Yes
Exporter FE	No	Yes	Yes	No	Yes	Yes
Dependent Variable	Log of Aggregate Non- Ag. Exports			Log of Aggregate Ag. Exports		

Note: Robust Standard Errors in Parenthesis. *** p<0.01, ** p<0.05, * p<0.1

Table 4. The effect of GSP and the relative preferential margin on bilateral exports in Agriculture and Non-Agriculture Sector

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Non-Agriculture Sector			Agriculture Sector		
Log of GDP of Exporter	1.210***	0.474***	0.537***	0.715***	0.356***	0.354***
	(0.018)	(0.060)	(0.077)	(0.018)	(0.045)	(0.058)
Log of GDP of Importer	0.894***	0.609***	0.647***	0.750***	0.757***	0.758***
	(0.015)	(0.055)	(0.078)	(0.018)	(0.045)	(0.070)
ETRI	-2.383***	-2.252***	-2.269***	-0.993***	-0.923***	-0.931***
	(0.144)	(0.145)	(0.145)	(0.058)	(0.058)	(0.058)
GSP Status as an Exporter	-0.236***	-0.534***	-0.521***	0.060	-0.610***	-0.613***
	(0.070)	(0.105)	(0.105)	(0.075)	(0.096)	(0.096)
ERPM	-1.564***	-1.529***	-1.533***	-0.855***	-0.833***	-0.836***
	(0.248)	(0.243)	(0.244)	(0.144)	(0.142)	(0.142)
(GSP==1)*ERPM	2.080***	2.022***	2.035***	0.497***	0.464***	0.466***
	(0.312)	(0.305)	(0.305)	(0.161)	(0.159)	(0.159)
Log of Distance	-1.138***			-0.719***		
	(0.038)			(0.034)		
Contiguity	0.732***			1.542***		
	(0.185)			(0.143)		
Common Official Language	0.468***			0.824***		
	(0.091)			(0.099)		
Colony	0.467***			0.928***		
	(0.162)			(0.139)		
Observations	17,905	17,905	17,905	33,923	33,923	33,923
R square	0.76	0.77	0.78	0.53	0.67	0.67
Importer FE	No	Yes	Yes	No	Yes	Yes
Exporter FE	No	Yes	Yes	No	Yes	Yes
Year FE	Yes	No	Yes	Yes	No	Yes
Dependent variable	Log of Aggregate Non- Ag. Exports			Log of Aggregate Ag. Exports		

Note: Robust Standard Errors in Parenthesis. *** p<0.01, ** p<0.05, * p<0.1

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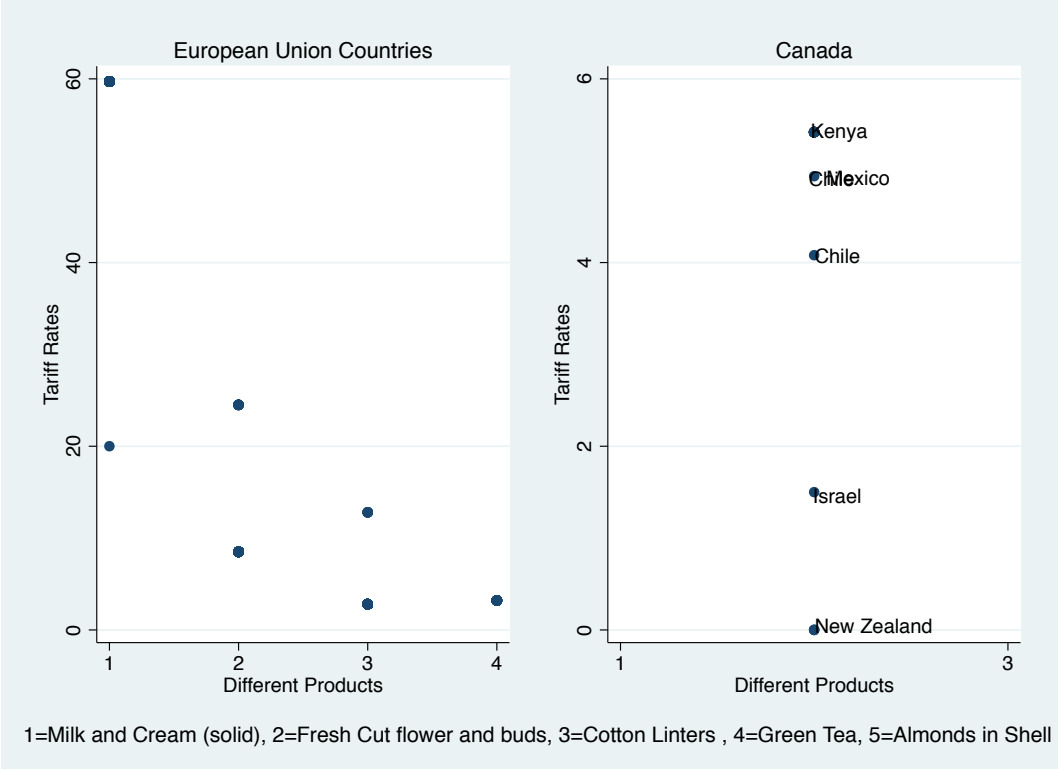

Fig.1. Differential preferential treatment based on the trade partner
Source: Author's Computation

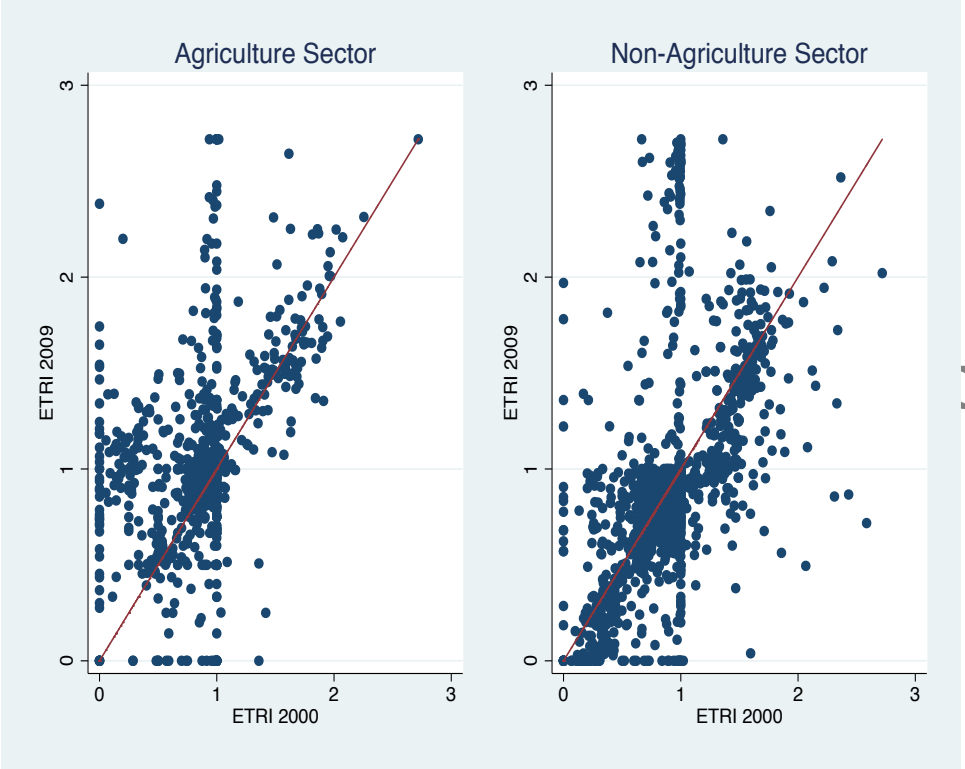

Fig.2. Level of ETRI in 2000 vs level of ETRI in 2009 across Agriculture and Non-Agriculture sector

Source: Based on author's Calculations

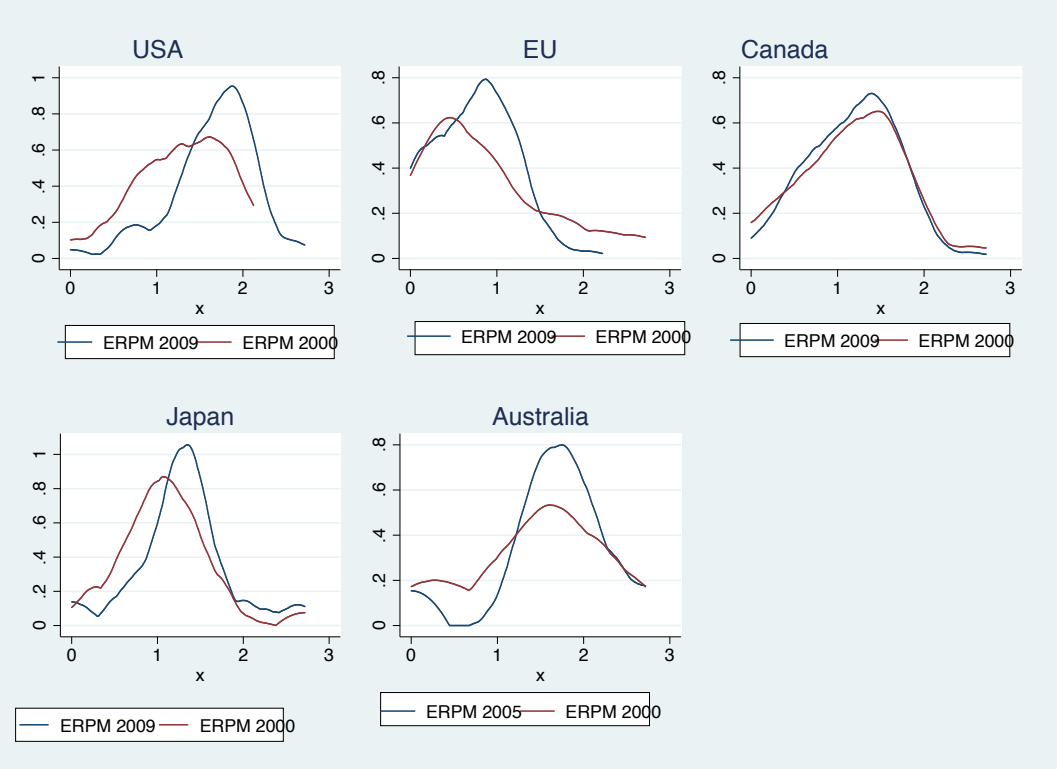

Fig 3.a. Distribution of ERPM as faced by suppliers in major Agricultural Markets in 2000 vs 2009
Source: Based on author's Calculations

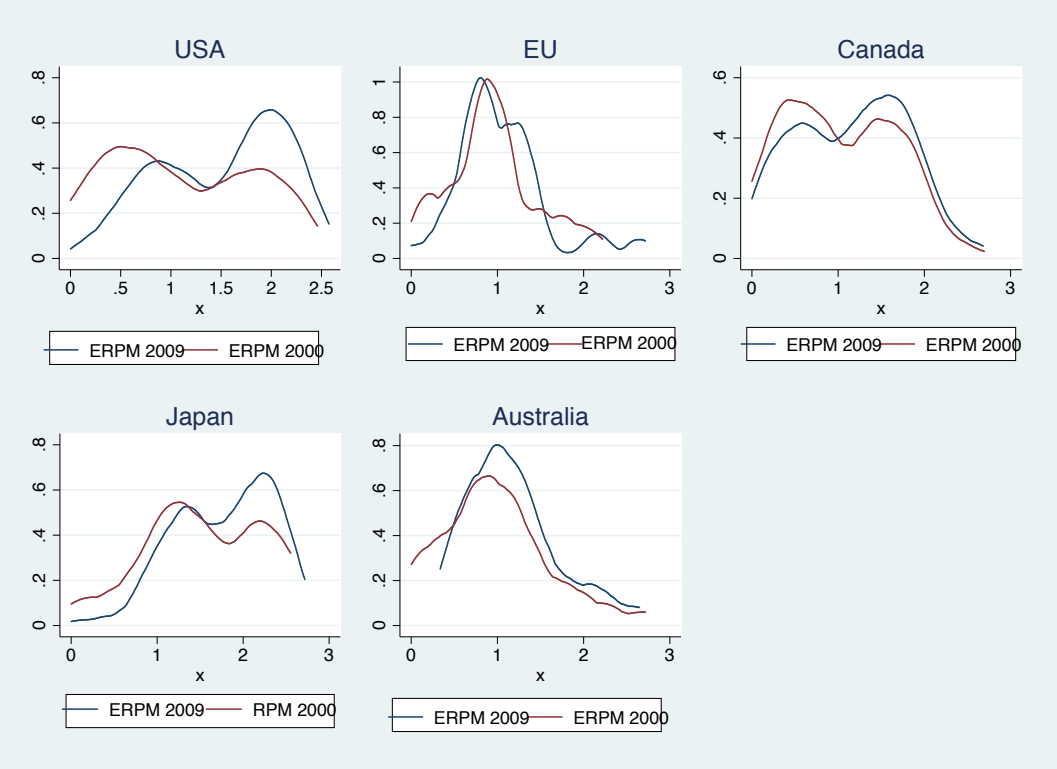

Fig 3.b. Distribution of ERPM as faced by suppliers in major Non-Agricultural Markets in 2000 vs 2009
Source: Based on author's Calculations

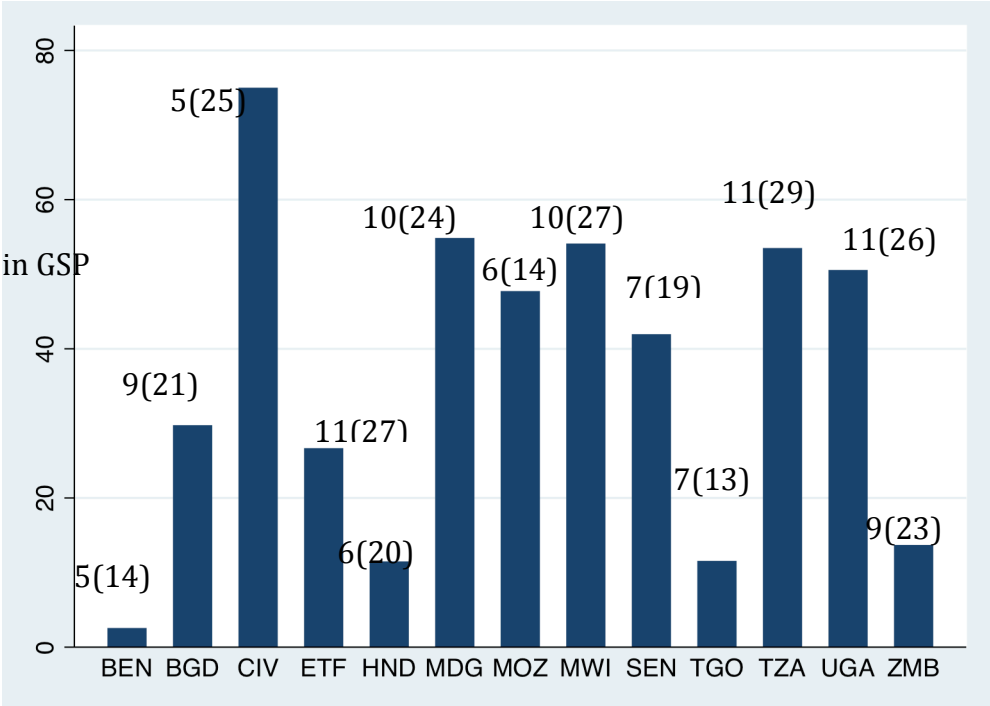

Fig.4.Percentage Share of GSP Exports in total Agricultural Exports for Least Developing Countries in the year 2009.

Notes: Figures in parenthesis indicate total number of export partners in the year 2009 while those outside the parenthesis are GSP export partner

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