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Impact of Free Trade Agreements on Imports: Evidence from Pakistan

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Abstract

This study examines the impacts of in-effect Free Trade Agreements (FTAs) on the imports of Pakistan using the extended gravity model of bilateral trade flows. The effects of FTAs are measured by finding the difference between MFN and preferential tariff rates (the tariff gap) as well as the zero-one binary dummy variable. Poisson Pseudo-maximum-likelihood (PPML) and Negative Binomial (NB) models are employed to avoid possible bias and inconsistent estimators as a result of using OLS estimation. Findings indicate that among the six in-effect FTAs of Pakistan, only the FTAs with Malaysia (PMFTA) and China (PCFTA) have a positive impact on the manufacturing imports of Pakistan. For agricultural imports, PIPTA (an FTA with Iran) is the most important FTA for Pakistan. At the 1-digit SITC, the effect of FTAs is mixed across products and FTAs. Although this study focuses on Pakistan, the results tend to be relevant to other developing countries, including Thailand, which actively negotiates and signs FTAs. Conclusions are two-fold. First, relying on the dummy variable potentially misleads the impacts of FTAs on trade and second, all signed FTAs may not be beneficial to trade as expected. This would depend on the initial and preferential tariff rates granted, as well as rules of origin.

Keywords: Free Trade Agreement, Pakistan Economy, Imports
JEL Classifications: F14, F15, O24, O53

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1. Introduction

Trade liberalization has been widely considered as a tool to accelerate economic growth through encouraging a larger volume of trade and investment over the past decades. In Asia the significance of trade liberalization is mostly a matter of interest and priority. South Asian countries have been gradually integrated into the world economy, although such progress is still slow compared to other Asian countries. Pakistan has also gradually liberalized its trade regime since 1988, when the government accepted the first IMF (International Monetary Fund) Structural Adjustment Program. After 1995, this policy gained greater momentum and WTO (World Trade Organization) related compliances have induced Pakistan to reduce import duties and eliminate various subsidies (WTO, 2008). However, since the new millennium, the mechanism intended to open up international trade has changed. The role of the WTO has gradually become less significant and has been replaced by a proliferation of preferential trade accords, widely known as free trade agreements (FTAs). The number of FTAs grew at a phenomenal rate between 2000 and 2015, reaching 222 agreements by 2015 from 50 in 2000 (ADB, 2014)[1]. Even though South Asia is a relative latecomer to the race of maximizing FTAs, its catching up speed has been phenomenal. It has long been argued that the limited success of South Asia in liberalizing regional trade was due to a lack of adequate attention to improving its main trade facilitation measures (World Bank, 2015). Among South Asian countries, Pakistan stands out as a notable example. The number of FTAs signed and/or under negotiation by Pakistan increased from zero to 16 in 2014.

Policymakers of developing countries are interested in signing FTAs, but the effect of such FTAs in promoting trade between FTA partners is far more complex than assuming such changes in trading behavior will take place automatically. This is particularly true for FTA signing between developing countries whose agreements contain long lists of exemptions and encompass operating under different trade liberalization schemes. All of them matter to the effect of FTAs in promoting trade between FTA partners. This complexity is unlikely to be fully captured by the zero-one dummy variable on the date that a FTA was signed and/or implemented partially. Hence, in contrast to the WTO, FTA-led liberalization is discriminatory and conditional. Preferential tariff rates offered under FTAs are directed towards members only, i.e. on a discriminatory basis with the expectation of boosting trade among members. Since under FTAs tariffs toward non-members can be different, rules of origins (ROOs) are imposed in order to prove the origin of the imported good, so as to determine its eligibility for tariff concessions/eliminations. As suggested in a number of previous studies, e.g. (Krishna, 2006; Kawai, 2005; Wignaraja et al., 2010), compiling ROOs is costly and potentially discourages the use of FTAs. The impact of an FTA on trade is, therefore, inconclusive, depending on these two measures opposing each other (i.e. trade stimulation from preferential tariffs offered and trade distortion induced by the complexity of the ROOs imposed). Moreover, when an FTA from developing countries includes long lists of sensitive products, then their implementation becomes rather complex, which makes the net impact on trade ambiguous. While FTA proliferation continues, the effect of an FTA on trade remains an open empirical question to be tested. The objective of this paper is to examine the effects of FTAs on trade, focusing on the import side using Pakistan as a case study. There are a number of empirical studies (e.g. Raihan and Razzaque, 2007; Coughlin and Novy, 2011; Saggi

[1] https://aric.adb.org/fta-trends-by-status

and Yildiz, 2009), which have examined the effects of FTAs, but most have focused on the export side. Relatively few have examined the impact of FTAs on imports, particularly at the disaggregated level. In this study, imports are further disaggregated into the 1–digit level of Standard International Trade Classification (SITC) to clearly examine the different effects of FTAs across product categories. This is done due to the fact that each product category might have different abilities in terms of complying with the rules of origin imposed, so that a given tariff gap might have different import-stimulating effects. Furthermore, in analyzing the impact of FTAs on trade, most studies, with few exceptions, have introduced a zero-one dummy variable into the gravity equation over and above the standard controlling variables, such as the Gross Domestic Product (GDP) of the home and host countries and geographical distance. In a number of studies, one is assigned to the dummy when the FTA of interest was signed and zero otherwise, e.g. Elliott and Ikemoto, 2004; Cheng and Tsai, 2008; Korinek and Melatos, 2009. This practice seems to be problematic when an FTA takes time to have its full effect. For example, the ASEAN Free Trade Area (AFTA) was signed in 1990, but took 15 years to be substantially implemented. Therefore, using the year an agreement was signed would be misleading. It would be further misleading when there is a mix between preferential and free trade agreements. The former involves only partial liberalization where the ultimate preferential tariff rate is not zero, while the ultimate tariff rate of the latter is zero. Against this backdrop, this paper applies the differences between MFN and preferential tariff rates (henceforth referred to as the tariff gaps) in each FTA to capture the changes in tariff rates over implementation of FTAs, as well as the different tariff reduction rates in each FTA signed. In fact, the use of FTA tariff rates, which are lower than general tariff rates, such as most favored nation (MFN) rates, could enable importers to import more raw material products at cheaper prices and generate positive benefits to growth enhancing activities in a country.

To our knowledge so far, Pelkmans-Balaoing (2007) and Okabe and Urata (2013) are the only studies which have used a tariff gap approach in their application of gravity models in examining the effects of an FTA instead of the dummy variable, as is the case with other studies. However, there are no empirical studies using a tariff gap approach in investigating the impacts of FTA on Pakistan's trade.

Pakistan is an appropriate case study for the subject at hand because of two key reasons. Firstly, it is the first runner up in South Asia after India in the number of FTAs signed and/or under negotiation. Pakistan FTAs are operating at bilateral, sub-regional or plurilateral levels. By 2014, it had engaged in 16 FTAs[2], out of which six are still in effect, namely the South Asia Free Trade Agreement (SAFTA), Pakistan-Malaysia FTA (PMFTA), Pakistan-China FTA (PCFTA), Pakistan-Sri Lanka FTA (PSFTA), Pakistan-Iran Preferential Trade Agreement (PIPTA), and Pakistan-Mauritius PTA (PMPTA). Secondly, like other developing countries, Pakistan signs and/or negotiates FTAs with its partners in the expectation that such FTAs will enable importers to attract more (raw material) products at cheaper prices and open up more market opportunities to capitalize on its geographical and comparative advantages. Nonetheless, so far there has been a dearth of systematic analysis on the import stimulating effects of FTAs on the economy of Pakistan[3].

[2] See detail at http://aric.adb.org/fta-country

[3] To the best of our knowledge so far, Akhter and Ghani (2010) is the only study using the gravity model to examine FTA effects on Pakistan. Nonetheless, their OLS-based result is likely to be affected by endogeneity from various sources, including omitted zero export observations.

This study examines the impacts of FTAs only concentrating on Pakistan. Pakistan is a good case study for the subject at hand because of two key reasons. Firstly, Pakistan is the first runner up in South Asia after India in terms of the number of FTAs signed, in-effect, and/or under negotiation. Secondly, like other developing countries, trade, especially in the import sector is crucial in stimulating long-term economic growth. Since our study focuses only on Pakistan, the results of this research will not be applicable to other countries. The findings for other countries could be different depending on the nature of the FTAs in effect, their time duration, and the independent variables included. Moreover, this study provides an analysis of only six FTAs of Pakistan because of data limitations[4]. However, our findings can raise research attention on how FTA effects are measured in a gravity model analysis. Heavily relying only on the binary dummy variable might mislead the trade enhancing effects of FTAs. In addition, to capture the possibly different impact of FTAs across products, analyzing imports at the disaggregated level would be needed. This is highly policy relevant to other developing countries within which a number of FTAs are actively negotiating and signed, and liberalization programs are introduced.

The organization of this paper is as follows: the next section reviews Pakistan's import performance and trade policies with a particular focus on its in-effect trading arrangements. Section 3 outlines the tariff gaps of each in-effect Pakistani FTA and the econometric model along with data sources and econometric procedure. Section 4 reports discussion on the estimated results. The final section 5 concludes the paper and provides policy inferences.

2. Imports of Pakistan

In Pakistan, trade liberalization started in 1980 and by 2002-03 the basic maximum tariff was reduced to 25 percent. According to the WTO trade policy review of 2008, Pakistan had ceased its unilateral tariff reduction program in 2002/03, wherein the simple average applied MFN tariff was 20.4% and shifted to gave-way piecemeal reforms, which reduced the simple average applied MFN tariff to 13.9% in 2009. Pakistan had high tariffs on alcoholic beverages and automotive products/items. Since 2001/02, the average applied MFN tariff on agriculture products dropped from 22.1% to 17.1% in 2009, while for non-agriculture products it reduced to 13.4%. Pakistan's coverage of bound tariffs in the textile sector indicates that 97.2% of tariff rates are fully bound and 0.8% partially bound. MFN tariffs of about 20% were applied to certain cement products, which are based on specified world prices. Currently, Pakistan operates under a relatively simple, four-rate structure, i.e. 25 percent, 20 percent, 10 percent and 5 percent. The average unweighted customs duty is 14.9 percent. Pakistan's trade liberalization has included the agricultural sector, where the unweighted average tariff (20.5 percent) is only moderately above the non-agricultural tariff average (13.8 percent).

Table 1 presents details of the five main import destinations of Pakistan goods over the last decade. The role of South Asian economies has not yet become important in terms of representing Pakistan's import destinations. Among South Asian economies India, Bangladesh and Afghanistan are relatively significant importing countries for Pakistan. India being the highest accounting for 3.3 per cent of the total imports of Pakistan from South Asia. China gained the most significant role among Northeastern

[4] The data coverage of the study was 2000-2010 and by 2010 only five FTAs of Pakistan remained in effect.

Asian economies (i.e. China, Japan, South Korea) as a Pakistani import destination during the last decade. Malaysia has a notably high share within the imports of Pakistan, being the only ASEAN member signing an FTA with Pakistan. The share of Malaysia in the total imports of Pakistan was 4.2 per cent out of 11.2 per cent during the period 2000-2010. Finally, when import destinations outside of South Asia are concerned, the US is the most important partner of Pakistan.

Table 1: Key Import Destinations of Pakistan 2000-2010
(% Share of Total Imports)

Regions	2000-10	
South Asia	4.11	
Afghanistan		0.289
Bangladesh		0.24
Bhutan		0.001
India		3.34
Maldives		0.001
Nepal		0.009
Sri Lanka		0.02
Commonwealth	19.13	
UK		2.54
ASEAN	11.26	
Malaysia		4.19
Northeast Asia	17.74	
China		10.65
US	6.12	

Source: Author's calculations using data from UN Comtrade Database

Pakistan's FTA partners include both developing and developed countries, regardless of their bilateral trade being substantial or not. While many trade agreements are still either under study or in negotiation, six agreements were already in effect by 2010. They are the South Asia Free Trade Agreement (SAFTA), Pakistan-Malaysia Free Trade Agreement (PMFTA), Pakistan-China Free Trade Agreement (PCFTA), Pakistan-Sri-Lanka Free Trade Agreement (PSFTA), Pakistan-Iran Preferential Trade Agreement (PIPTA) and Pakistan-Mauritius Preferential Trade Agreement (PMPTA). However, their tariff reduction schedule is complex. Products are categorized in many groups with different tariff reduction schedules, some of which are expressed in mathematical formulae. There are also a sizable number of tariff lines under sensitive lists which are not included in tariff reduction schemes. Tariff-free products were rarely found in these agreements, although most of them are literally referred to as free trade agreements. The details of the six in-effect FTAs investigated in this study are as follows in Table 2

Table 2**:** Free Trade Agreements (FTAs) status of Pakistan, 2014

FTA/PTA	FTA Partners	Current status	Implementation Year
South Asian Free Trade Area (SAFTA)	Pakistan – Bangladesh –India – Nepal- Sri Lanka- Afghanistan – Bhutan- Maldives	Signed & In Effect	2006
Malaysia-Pakistan Closer Economic Partnership Agreement (PMFTA)	Pakistan- Malaysia	Signed & In Effect	2008
People's Republic of China-Pakistan Free Trade Agreement (PCFTA)	Pakistan - People's Republic of China	Signed & In Effect	2007
Pakistan-Sri Lanka Free Trade Agreement (PSFTA)	Pakistan - Sri Lanka	Signed & In Effect	2005
Pakistan-Iran PTA (PIPTA)	Pakistan – Iran	Signed & In Effect	2006
Pakistan-Mauritius PTA (PMPTA)	Pakistan – Mauritius	Signed & In Effect	2007
Pakistan-Gulf Cooperation Council Free Trade Agreement (Pakistan-GCC FTA)	Bahrain, Oman, Saudi Arabia, Kuwait, Qatar, and United Arab Emirates	Negotiations launched	2006
Pakistan-MERCOSUR PTA	Pakistan, Argentina, Paraguay, Brazil and Uruguay	Framework agreement (FA*) signed	2006
Pakistan-Turkey Preferential Trade Agreement	Turkey Pakistan	(FA) signed	2004
Trade Preferential System of the Organization of the Islamic Conference (TPS-OIC)	Afghanistan, Algeria,Bahrain, Brunei, Darussalam, Egypt, Indonesia, Jordan, Kuwait, Lebanon, Morocco, Nigeria, Saudi Arabia, Suriname, Tajikistan, Turkey,Uganda, Uzbekistan, Albania, Azerbaijan, Bangladesh, Cote Divoire, Guinea, Iran, Kazakhstan, Kyrgyz Republic, Maldives, Mozambique, Oman, Qatar, Senegal, Syrian Tunisia, Turkmenistan, United Arab Emirates, Yemen.	Signed but not yet In Effect	2011
Pakistan-Bangladesh FTA	Bangladesh	Negotiations launched	2003
Pakistan-Morocco PTA	Morocco	Negotiations launched	2005
Pakistan-Singapore FTA	Singapore	Negotiations launched	2005
Economic Cooperation Organization Trade Agreement (ECOTA)	Iran, Tajikistan, Afghanistan, and Turkey	Signed but not yet In Effect	2003
Pakistan-Indonesia FTA	Indonesia	Signed and In Effect	2013
Preferential Tariff Arrangement-Group of Eight Developing Countries (PTA-D8)	Bangladesh, Indonesia, Malaysia, Pakistan, Egypt, Iran, Nigeria, Turkey	Signed and In Effect	2011

Note: This study considered only the Signed and In Effect FTAs/PTAs of Pakistan until 2010 (The first six rows of above table). Only six FTAs of Pakistan included for analysis because of the data limitation.
*FA stands for Framework of Agreement
Source: http://aric.adb.org/fta-country

2.1 South Asia Free Trade Agreement (SAFTA)

Under SAFTA[5], Pakistan being a member of non-LDCs (Least Developed Countries) had reduced tariffs to 0-5% for LDCs members (i.e. Bangladesh, Bhutan, Nepal, and Maldives) by 2009. Meanwhile, Pakistan's tariff reduction for two other non-LDCs (i.e. India and Sri Lanka) was implemented in two phases (see Table 3). The total amount of sensitive items in the list of Pakistan comprise 1,183 products (e.g. meat, vegetables, fruits, chemicals, furniture etc.) which constitute 22.6% of total tariff lines. Pakistan and India represent the two most populous and largest economies within the South Asian region. However, official bilateral trade remains negligible and neither country falls in the category of being a top ten mutual trading partner of the other partly due to their hostile history of separation and their constituting relatively closed economies. On the other hand, Pakistan allows only a small list of items to be imported from India under its positive list. The 2008 positive list (according to the Import Policy Order 2008 and Ministry of Commerce of Pakistan) allows 1,938 import items. The positive list gets changed frequently, either to satisfy local demand, bring down prices, or due to political conflicts (Raihan and Razzaque, 2007).

Table 3: Schedule of Tariff Reduction under SAFTA

Pakistan's offer to LDCs	0-5% within three years (2006-2009).
Pakistan's offer to Non-LDCs	Existing tariff rates above 20% to be reduced to 20% within two years. Tariff below 20% to be reduced on margin of preference basis of 10% per year (2006-2008). Tariff to be reduced to 0-5% within five years (2008-2013).
Rule of Origin	
For non-LDCs	40% value addition + change in tariff heading at 4 digits (CTH).
For LDCs	30% domestic value addition (DVA) + CTH.

Source: Ministry of Commerce of Pakistan

2.2 Pakistan-Malaysia Free Trade Agreement (PMFTA)

The Comprehensive Free Trade Agreement for Closer Economic Partnership between Pakistan and Malaysia was signed on the 8th of November 2007 in Kuala Lumpur, Malaysia. As per this agreement, for trade in goods Pakistan has agreed to eliminate tariffs on 43.2% of current imports from Malaysia by 2012. Similarly, Pakistan has also reduced tariffs on seven palm oil tariff lines by 15 per cent Margin of Preference (MOP), that is ten per cent in 2008 and an additional five per cent in 2010. The major commodity group imported by Pakistan from Malaysia is Animal & Vegetable Fats/Oils (HS-15). Machinery (HS-84) is the second major chapter supplied by Malaysia to Pakistan having a marginal share of about 2.4% in Pakistan's total imports from Malaysia; Articles of Plastics (HS-39) is third having a share of about 2.3% in 2010. Other major items supplied by Malaysia to Pakistan are Organic Chemicals (HS-29), Mineral Fuels (HS-27), Chemical Products (HS-38), Rubber (HS-40), Manmade Filament (HS-54), Wood and Articles of Wood (HS 44) and Electronic Equipment (HS 85). All the above top ten products collectively account for 94.4% of Pakistan's total imports from Malaysia (Ministry of Commerce of Pakistan).

According to the Pak-Malaysia free trade agreement the tariff liberalization program agreed upon by both parties has led to the following schedule (see Table 4) of concessions comprising multiple tracks such as the Highly Sensitive List (HSL), Exclusion List (EL), Fast Track (FT) and the Sensitive Tracks (ST) mechanism, i.e.

[5] SAARC: South Asian Association for Regional Cooperation; member countries are Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka.

ST1, ST2 and ST3. Pakistan has also offered Margins of Preference (MOPs) to Malaysia, which may be further disaggregated to MOP1 and MOP2.

Table 4: Tariff Liberalization Schedule offered by Pakistan to Malaysia

Tracks	% of total tariff lines offered under FTA	Duty	Year	Examples of tariff concession products
Fast Track	25.03%	0%	2009	Live and frozen animals, eggs, vegetables, fruits etc
Normal Track	17.72%	0%	2012	Tea, seeds, cereals etc
Sensitive Track-1	11.70%	5%	2011	Cereals, wheat, seeds etc
Sensitive Track-2	8.71%	10%	2014	Chemicals, cement etc
Sensitive Track-3	20.91%	20%	2011	Fats, waxes etc
Rules of Origin	40% local content rule applied on EHP products while product specific rules applied to textile, clothing and gems & jewelry.			

Source: Ministry of Commerce of Pakistan

2.3 Pakistan-China Free Trade Agreement (PCFTA)

China has become an important trading partner of Pakistan in the region. In recent years both countries have taken several steps to improve trade and investment relations with each other, especially in the case of the signing of a bilateral free trade agreement (FTA) in 2006. Trade between the two countries has increased manifold. In the China-Pakistan FTA, Pakistan offered tariff concessions for Chinese goods across all industry slabs and margins of preference (MOPs) reduction rates at different levels (see Table 5).

Table 5: Tariff Reduction Categories given by Pakistan to China under Phase-I

Category No.	Tracks	No. of Tariff Lines	% of Tariff lines at 8 digit	Example of tariff concession Products
I	Elimination of tariffs (three years)	2423	35.6%	Live animals and vegetables, fruits, chemicals, cotton etc
II	0-5% (five years)	1338	19.9%	Eggs, seeds, fruits etc
III	Reduction on margin of preference from 50% (five years)	157	2.0%	Fish, fruits, fabrics, leather etc.
IV	Reduction on margin of preference from 20% (five years)	1768	26.1%	Vegetables, fruits, oils etc.
V	No concession	1025	15.0%	Live and frozen animals, dairy products, cereals, oils, chemicals etc.
VI	Exclusion	92	1.4%	Alcoholic beverages, whole grains, military weapons etc.
Rule of Origin	Local value added content formula: Value of non-originating materials / FOB Price *100 < = 60%			

Source: Ministry of Commerce of Pakistan

The major factors responsible for the success of Chinese exports in Pakistan are the supportive attitude of the Government of Pakistan to Chinese business activities and trade, the lack of barriers to Chinese imports in Pakistan after PCFTA, the low price and lack of competitors for the Chinese textile industry and almost zero tariffs affecting

most exports from China. Lastly, Pakistan faces lower trade and transaction costs with China than with India (Shabir and Kazmi, 2007).

2.4 Pakistan-Sri-Lanka Free Trade Agreement (PSFTA)

Pakistan has offered 206 tariff lines (at the six-digit level) to Sri Lanka with immediate zero duty under the PSFTA. However, the Pakistani negative list consists of 540 tariff lines at the six-digit level (Table 6). This includes many Sri Lankan export interest items, such as tea (except for a quota of 10,000 metric tons), several textile and garment items, rubber products, paper products, many dairy products, plastic products, footwear, and certain ceramic items. The exclusion of these interest items of Sri Lanka from the PSFTA represents the main cause behind the negative impact of PSFTA performance in this study (see Results and Discussion, Section 4).

Table 6: Tariff Reduction Categories offered by Pakistan to Sri Lanka

Categories	Tariff Concessions	Items included	Example of tariff concession products
Category I	Negative list	540 HS tariff lines (products) at six digit level	Dairy products, oils, tobacco, chemicals, plastic, rubber etc.
Category II	100% Immediate Concession List	206 HS tariff lines (products) at six digit level	Fresh and frozen meat, vegetables, spices, chemicals etc.
Category III	Quota base tariff	27 products at six digit level	Apparel & tea.
Category IV	Margin of Preference	5 HS tariff lines MOP of 20% on the applied MFN duty	Tableware and kitchenware and ceramic tiles.
Rule of origin	Cumulative ROOs to apply, an aggregate DVA of 35 percent must apply with a minimum of 25 percent value addition in the final exporting country.		

Source: Ministry of Commerce of Pakistan

2.5 Pakistan-Iran Preferential Trade Agreement (PIPTA)

Under this Agreement, Pakistan offered concessions to Iran on 338 tariff lines; preferences granted by both countries to each other cover approximately 18% of the MFN tariffs of both countries. The products affected by tariff concessions under the PIPTA include chemicals, machinery and apparatus, furniture and sea food etc. To meet ROO criteria, not wholly produced products need to have more than 50% of domestic content.

2.6 Pakistan-Mauritius Preferential Trade Agreement (PMPTA)

The Pakistan and Mauritius PTA has allowed 104 tariff lines to be traded between both countries on a preferential basis. In this trade agreement Pakistan has granted a margin of preference of 15-30% (it was to increase up to 50-100% by 2008) for the first year of PMPTA on 130 items / tariff lines, i.e. 1.9% of its total existing national tariff lines. Tariff concession products include mainly textiles & flowers, steel, heaters, etc. Both parties committed to not exceeding more than 65% of the free-on board (f.o.b) value of the goods produced or obtained in order to qualify for preferential treatments under ROOs criteria concerning PMPTA.

2.7 The Tariff Gap of each in-effect Pakistani FTA

To examine the import enhancing effect of an FTA, we use tariff gaps, the difference between most-favored-nation (MFN) and FTA preferential tariff rates, measured as a ratio of MFN tariff rates. The formula is in Eq.1;

$$TM_{i,t} = \left(\frac{MFN\ tariff\ rate_t - FTA tariff\ rate_{i,t}}{MFN\ tariff\ rate_t} \right) \quad \text{(Eq.1)}$$

Where, TM is the tariff margin/tariff gap. Each tariff gap is then summarized by 1-digit SITC and shown in Figure 1 regarding each FTA. Note that tariff gaps among agricultural products are calculated from the tariff gap of products in SITC 0-4, while tariff gaps for manufacturing products are calculated from the tariff gap of products in SITC 5-8. The higher the gap, the more concessions are provided.

This seems different from previous studies where a binary variable (zero-one) is used for FTAs. Using such a variable occurs under the implicit assumption that an FTA takes full effect immediately. This is rather restrictive for FTAs signed among developing countries in which tariff reduction schedules are complicated and associated with long implementation periods, as well as involving a number of exceptions. In these circumstances, the dummy could capture other shocks occurring at the same time when an FTA is signed. On the other hand, the tariff gap used in this paper is more theoretically favorable in capturing the effect of an FTA. It not only reflects the magnitude of the preferential tariff offered, but can also vary across years as well as product lines. Note that for the purpose of comparison, the binary variable approach is also applied here, one is assigned when the FTA of interest is in effect, and zero otherwise. The coefficient is expected to be either positive or zero. When the coefficient turns out to be positive, it implies that the FTA positively affects Pakistan's imports. Otherwise, the FTA would not have any significant effect on its imports.

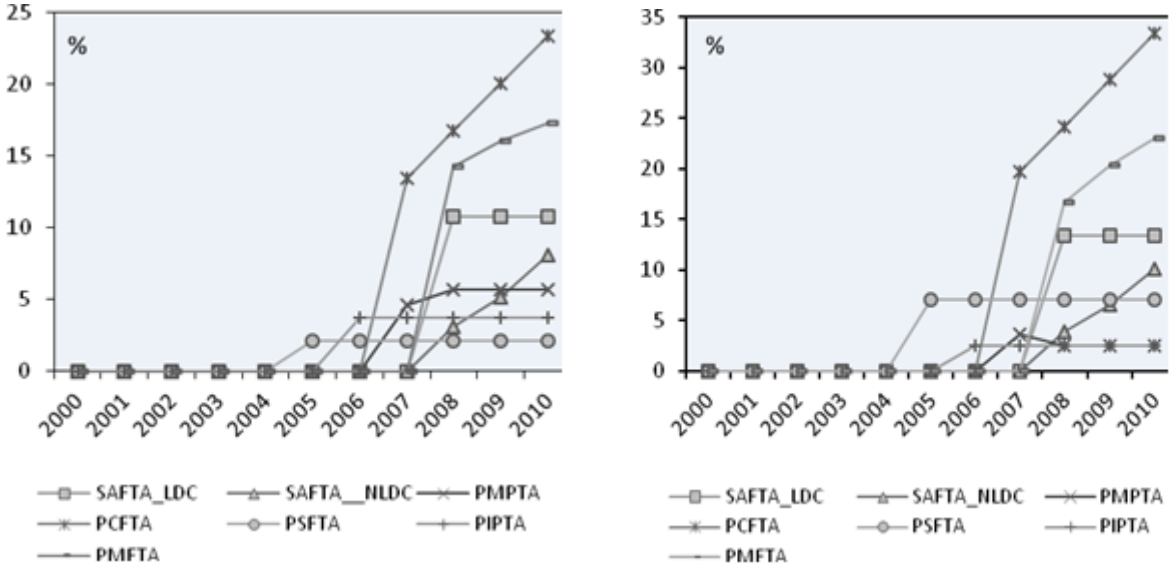
The following Figure 1 shows that the tariff reduction in each FTA is scheduled over each period of years and the tariff concessions are different in each product. To summarize the tariff reduction in each FTA and each product category, tariff gaps, i.e. differences between MFN and preferential tariff rates, are calculated in detail for each product and FTA (see formula of tariff gap/tariff margin in equation 1). For example, the tariff gap has been calculated for more than four thousand products within the SAFTA and more than three thousand products in the context of the PCFTA in this study.

When comparing all in-effect FTAs it is evident (Figure 1) that tariff gaps are highest for products under the PCFTA[6] in both the agriculture and manufacturing sectors of Pakistan. Following the PCFTA is the PMFTA, indicating that Pakistan grants more tariff concession to Chinese and Malaysian agricultural and manufacturing products. Regarding the SAFTA, Pakistan has different tariff reduction schedules for LDCs and non LDCs members of SAFTA[7]. The tariff gaps of the non-LDC manufacturing sector dominate those of agriculture and the gap is tending to rise in both sectors. In the agriculture sector the lowest tariff gap is for the PSFTA, while the lowest tariff rate in manufacturing is for the PIPTA. Finally, both the PSFTA and PIPTA exhibit a steady, changing trend in terms of tariff gaps across both sectors (see Figure 1).

[6] PCFTA has the largest stimulating impact in the imports of Pakistan in both sectors, i.e. agriculture and manufacturing.

[7] Note that the tariff gap for LDCs is higher than non-LDCs in both sectors.

Figure 1: Tariff Gaps granted by Pakistan under Selected FTAs



(a) Agricultural Sector (b) Manufacturing Sector

Note: Tariff gap for each FTA is calculated by taking average of tariff gap in each product category.
Source: Author' calculations using data from the UN Comtrade Database

3. Methodology and Data Sources

The methodology employed and data sources of all variables are discussed below.

3.1 Empirical Model

To assess the trade enhancing effect of FTAs, the famous gravity equation is employed. According to the standard gravity model the trade flows between countries are a function of income as explained by their Gross Domestic Product (GDP/GNP) and the geographical distance (Eq.2) between them. Higher income countries tend to trade more, while trade becomes cheaper when trading countries are in close proximity.

$$t_{ij} = \alpha \frac{GDP_i^{\beta_1} \times GDP_i^{\beta_2}}{dist_{ij}^{\beta_3}} \qquad \text{(Eq. 2)}$$

where, t_{ij} = trade value between countries *i* and *j*

GDP_i and GDP_j = Gross Domestic Products of countries *i* and *j*

$dist_{ij}$ = geographical distance between countries *i* and *j*

α = the parameter capturing the effects on bilateral trade of other factors, such as tariffs, FTAs, and real exchange rates etc.

The theoretical support behind the gravity equation was initially poor, but later on several theoretical developments appeared to support the gravity model (see Anderson, 1979; Deardorff, 1995; Bergstrand, 1985; Wei, 1996; Mátyás, 1997; Egger, 2004). Hence, based on such studies the log-linear form of the gravity equation can be expressed as in Eq.3.

$$\ln t_{ijt} = \ln \alpha + \beta_1 \ln GDP_{it} + \beta_2 \ln GDP_{jt} - \beta_3 \ln dist_{ij} \quad \text{(Eq.3)}$$

In our study, we focus on imports only, hence the dependent variable here is (real) import value from country *j* to country *i* in period *t.* In this study the GDP of exporting (measures productive capacity) and importing countries (measures absorptive capacity) are introduced separately. The impact of GDPs is expected to be positively related to imports[8]. On the other hand, an increase in physical distance (proxy of transportation costs) is expected to decrease imports. In addition, there are some other factors affecting trade volume, captured by the parameter α, included in this study. These factors are the population of both Pakistan and its trading partners (POP_{it} and POP_{jt}, respectively). Two binary dummy variables, i.e. common borders (CB) and common language (CL), are also introduced. The population size in the exporting and importing country is related to their respective market sizes or economies of scale. The binary dummies (CB and CL) are equal to one when Pakistan and its trading partners share common borders and language, respectively, and zero otherwise. These two additional variables capture natural (not policy-induced) impediments to trade, even for industrialized countries (McCallum, 1995). Since prices vary over time, the bilateral real exchange rate (RER) is also introduced to rectify bias from the presence of multilateral resistance.

To take into account the heterogeneous nature of tradable products (Jongwanich, 2010), total imports are further disaggregated into two product groups, i.e. agriculture (the sum of SITC 0 to 4) and manufacturing (the sum of SITC 5-8) groups to examine whether the effects of each FTA are different. In addition, we have also estimated at the SITC-1 digit level of disaggregation.

All in all, the empirical equation used in this study is as follows;

$$\begin{aligned} M_{ijt} = {} & \beta 0 + \beta 1 \ln(\mathrm{GDP})_{it} + \beta 2 \ln(\mathrm{GDP})_{jt} + \beta 3 \ln(\mathrm{Dist})_{ij} + \beta 4 \ln(\mathrm{POP})_{it} + \\ & \beta 5 \ln(\mathrm{POP})_{jt} + \beta 6 \ln(\mathrm{RER})_{ijt} + \beta 7(\mathrm{CB})ij + \beta 8(\mathrm{CL})ij + \beta 9(\mathrm{Tariff})_{ijt} + \\ & \beta 10\ (\mathrm{SAFTA\_LDC})_{ijt} + \beta 11\ (\mathrm{SAFTA\_NLDC})_{ijt}\ \beta 12(\mathrm{PCFTA})_{ijt} + \\ & \beta 13(\mathrm{PMFTA})_{ijt} + \beta 14\ (\mathrm{PSFTA})_{ijt} + \beta 15\ (\mathrm{PIPTA})_{ijt} + \\ & \beta 16\ (\mathrm{PMPTA})_{ijt} + (\mathrm{e})_{ijt} \end{aligned} \quad \text{(Eq.4)}$$

where, M_{ijt} = (real) bilateral import into Pakistan from country *j* at year *t* with four alternatives;

1. Total imports
2. Agricultural imports (sum of SITC 0-4)
3. Manufacturing imports (sum of SITC 5-8)
4. Imports at the SITC-1 digit level of disaggregation (SITC 0 – 8)

GDP_{it} = (real) Gross domestic product of Pakistan at year *t*

GDP_{jt} = (real) Gross domestic product of Country *j* at year *t*

Dist_{ij} = Distance between Pakistan and Country *j*

POP_{it} = Population of Pakistan at year *t*

[8] The larger market will produce a greater number of products and be a net exporter of differentiated goods (Krugman and Venables, 1993)

POP_{jt} = Population of Country j at year t

RER_{ijt} = Bilateral real exchange rate between Pakistan and Country j at year t

CB_{ij} = Common border dummy with Pakistan, which equals one when Country j shares the border with Pakistan and zero otherwise.

CL_{ij} = Common language dummy with Pakistan which equals to one when Country j uses the same language as of Pakistan and zero otherwise.

$Tariff_{ijt}$= MFN tariff rates between Pakistan and country j in year t

$SAFTA_{ijt}$ [9]= SAFTA variable proxied by two alternatives;

1. Tariff gap SAFTA exporters (both LDCs and NLDCs) receive from Pakistan at year *t*
2. Zero-one dummy variable; one when import destination belongs to Pakistan in 2006 and after ; zero otherwise

$PCFTA_{ijt}$ = PCFTA variable proxied by two alternatives;

1. Tariff gap Chinese exporters receive from Pakistan at year *t*
2. Zero-one dummy variable; one when import destination is Pakistan in 2007 and after; zero otherwise

$PMFTA_{ijt}$ = PMFTA variable proxied by two alternatives;

1. Tariff gap Malaysian exporters receive from Pakistan at year t
2. Zero-one dummy variable; one when import destination is Pakistan in 2008 and after; zero otherwise.

$PSFTA_{ijt}$ = PSFTA variable proxied by two alternatives;

1. Tariff gap Sri Lankan exporters receive from Pakistan at year *t*
2. Zero-one dummy variable; one when import destination is Pakistan in 2005 and after , zero otherwise

$PIPTA_{ijt}$ = PIPTA variable proxied by two alternatives;

1. Tariff gap Irani exporters receive from Pakistan at year *t*
2. Zero-one dummy variable; one when import destination is Pakistan in 2006 and after; zero otherwise

$PMPTA_{ijt}$ = PMPTA variable proxied by two alternatives;

1. Tariff gap Mauritius exporters receive from Pakistan at year *t*
2. Zero-one dummy variable; one when import destination is Pakistan in 2007 and after; zero otherwise

3.2 Data Sources and Econometric Procedure

The data of bilateral imports into Pakistan from 214 destination partners is taken from the United Nations Commodity Trade Statistics Database (UN COMTRADE Database) for the period 2000-2010. The consumer price index of the US is used as a deflator to obtain real import values. Information about the distance variable is taken from the Centre d'Etudes Prospectives et d'Informations Internationales (CEPII) database, whereas common border and common language data is derived from the CIA-World Fact book. Real GDP is taken from World Development Indicators (WDI). As for the components of the TM variable, the data of MFN is derived from International Trade Statistics of International Trade Centre (INTRACEN), while FTA tariff data is accessed from the Ministry of Commerce of Pakistan. The details of tariff concession

[9] For import analysis, SAFA is further sub-divided into SAFA for LDCs and SAFTA for NLDCs.

and schedules for each FTA and product have also been taken from Ministry of Commerce of Pakistan. Tariff rates data is obtained from World Integrated Trade Solutions (WITS).

Our econometric procedure in this study employs the methods of Silva and Tenreyro (2006) wherein the dependent variable is the level of (real) import value, while all other explanatory variables are in logarithms. This is done to include zero import flows. There is a more convincing argument to include zero import flows when analyzing Pakistan's case. The conventional log-linear formulation of the gravity model cannot include zero-valued bilateral trade flows, because the logarithm of zero is undefined. However, zero flows might not occur randomly, but due to economic factors, such as geographic distance, low levels of national income, a lack of cultural or historical links etc. These factors seem relevant for an economy like Pakistan. Omitting zero-flow observations implies that we lose information on the causes of (very) low trade, which in turn can result in biased empirical results (Rauch, 1999; Frankel et al., 1997; Silva and Tenreyro, 2006). Hence, zero import flows are included in our analysis.

Poisson pseudo-maximum-likelihood (PPML) estimation is employed to avoid possible bias and inconsistent estimators as a result of using OLS estimations in the presence of a heteroskedasticity problem. Its estimates are consistent in the presence of fixed effects which can be entered as dummy variables, as in simple OLS. This is particularly important for gravity modeling because most theory-consistent models require the inclusion of fixed effects by both the exporter and importer (Freenstra et al., 2001).

On the other hand, there is a growing concern regarding restrictive assumptions under the PPML estimation where the conditional mean and variance of the distribution are equal. In particular, (Burger et al., 2009) argued for using a more generalized version; a negative binomial (NB) model where the conditional mean and variance of the distribution are not necessarily equal. Instead of choosing one over the other, this study uses both estimation methods to check the robustness of the analysis.

4. Results Discussion

A gravity model of Pakistan's imports, equation (4) above, has been estimated taking into account all variables and the results are presented in Table 6 using both Poisson Pseudo-Maximum-Likelihood (PPML) and Negative Binomial (NB) estimators. In addition, two alternative measures of FTA effects, i.e. binary dummy variable and tariff gap, are used. Generally, results from both estimation methods are similar with some exceptions.

The foundational building block for the modeling of count data is the Poisson Regression Model, but researchers generally employ more general specifications, such as the Negative Binomial (NB) Model (Cameron and Trivedi, 1986) on the assumption that trade data is likely to exhibit over-dispersion. Therefore, both Poisson and Negative Binomial Regression models are designed to analyze count data. However, these regression models differ in regards to their assumptions concerning the conditional mean and variance of the dependent variable. Poisson models assume that the conditional mean and variance of the distribution are equal. Negative binomial regression models do not assume an equal mean and variance and particularly correct for over dispersion (variance greater than the conditional mean) in the data. Hence, this leads to the increased popularity of negative binomial regressions in contemporary studies of trade analysis (MacDonald, 2010).

It is of note that Poisson is consistent as a pseudo-maximum likelihood estimator (PPML) regardless of how the data is in fact distributed. Second, the negative

binomial estimator has the undesirable property in a trade context that is it is not scale invariant[10] and this might be problematic in a gravity modeling context. Furthermore, model parameters communicate the same information in both Poisson and negative binomial regression models. Therefore, in this study we use both PPML and NB regression models to overcome the issue of overdispersion (NB) and to scale the invariant problem (PPML) (Braga & Bond, 2008).

For total imports (Table 7) the dummy variable (DV) and tariff gap (TG) results are not the same (only a few coefficients match). However, results from PPML under TG correspond well with the observed import patterns of Pakistan (see Figure 2). Thus, the following discussion will be based on the PPML results. NB[11] results will be discussed when relevant.

In terms of FTA specific effects, both the tariff gap and dummy variable yield similar results, but the magnitude of coefficients is much bigger in the case of tariff gaps. From the estimated results, the coefficients associated with FTAs are positive and significant only for Malaysia (PMFTA) and China (PCFTA), while they are negative and significant only for PMPTA (Mauritius). The results are insignificant in terms of Sri Lanka (PSFTA) and Iran (PIPTA) (see Column D of Table 7). Note that from the structure of FTAs; the products that Pakistani importers could import more using PMFTA and PCFTA comprise raw materials, for which Pakistan tends to have less comparative advantage (Menon, 2007). Interestingly, how FTA is measured (i.e. either by dummy variables or tariff gaps) affects only the magnitude of estimates. The effect of FTAs tends to be higher when they are measured by the tariff gap. While the tariff gap is more theoretically favorable in capturing the effect of an FTA, this implies that analysis based on the use of dummy variables has a tendency to underestimate the impact of FTAs.

The largest effect of PMFTA is observed in line with the fact that Pakistan fulfills more than 95% of its import demand of refined palm oil, crude palm oil, RBD palm oil and coconut from only a single market like Malaysia (Economic Survey of Pakistan, various editions). If we look at the import performance of Pakistan from Malaysia, it is noticeable that only nine tariff lines, comprised primarily of palm, coconut and babassu oil products, constituted about 78.28% of Pakistan's total imports from Malaysia in 2010. Pakistani import demand for these products was considerable and the import value of these nine lines amounted to US$ 426.4 million, which increased four- fold to US$ 1.61 billion in 2010. In order to cater for the surging import demand, Pakistan offered margins of preference on these items of nine lines with a tariff reduction to 15-20% by 2010.

China has become a closer FTA partner of Pakistan because of the elimination of trade barriers through FTAs and the supportive attitude of the government of Pakistan resulting in a larger expansion of trade between both countries. The most important items within Pakistan's imports from China are machinery and mechanical appliances, together with textile articles. These two categories comprise about 51 per cent of all of the imports of Pakistan from China. Machinery and mechanical appliances maintained the top position, while textiles and textile articles replaced chemical products in the number two ranking in 2007, accounting for about one fifth of the total exports from China (Menon, 2007).

Pakistan's imports from SAARC countries are low. Pakistan offers different tariff reduction schedules for SAFTA least developed countries and non-least

[10] Thus, results from a model with trade in dollars as the dependent variable will be different from those obtained with trade in millions of dollars as the dependent variable.

[11] The robustness check is done by adopting the NB model.

developed countries. Hence, in this study we have used two variables to indicate SAFTA members under the SAFTA variable, i.e. SAFTA for LDCs and SAFTA for NLDCs. The low level of trade within SAARC is mainly due to political disputes between the major players, Pakistan and India. Moreover, each country's relatively low levels of industrialization, similar levels of development, and enormous volume of unrecorded trade might also contribute to such poor results. On the other hand, efforts to promote regional integration and cooperation through SAARC have suffered negatively, greatly due to the prevailing tensions and conflicts in the region. Furthermore, due to the lack of common consensus on implementing multilateral trade agreements (such as SAFTA), bilateral concords are becoming more popular among SAARC member countries (World Bank Report 2015).

The two possible reasons behind the significant negative coefficient of PMPTA are potentially the lowest tariff margins compared to all the other FTAs of Pakistan under discussion in this study and the fact that most of the tariff concession products belong to the textile sector which has low demand in Pakistan because Pakistan is traditionally both renowned and self-sufficient in textile production (Table 7).

Table 7: Estimation Results of Total Imports

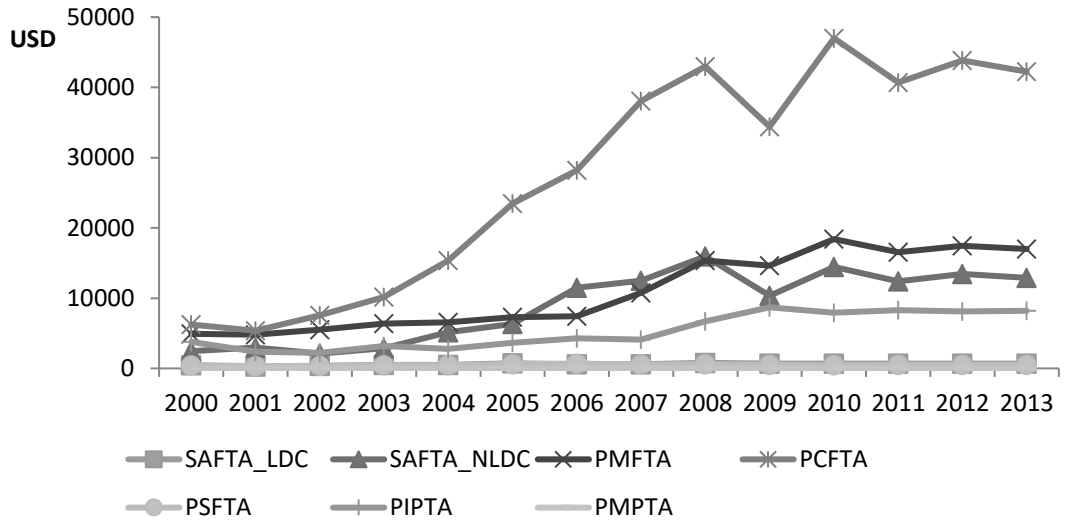
	Dummy Variable		Tariff Gap	
	NB	PPML	NB	PPML
Variables	Column A	Column B	Column C	Column D
ln GDP_{it}	3.938 (1.41)	5.792 (2.31)*	3.950 (1.41)	6.506 (2.52)*
ln GDP_{jt}	0.832 (23.75)**	0.873 (22.58)**	0.832 (23.76)**	0.872 (22.66)**
ln $dist_{ij}$	-2.007 (15.42)**	-1.237 (6.49)**	-2.006 (15.40)**	-1.211 (6.78)**
ln POP_{it}	-6.480 (0.83)	-11.409 (1.65)	-6.518 (0.83)	-13.327 (1.85)
ln POP_{jt}	0.297 (6.35)**	-0.198 (3.92)**	0.297 (6.35)**	-0.197 (3.91)**
ln RER_{ijt}	0.049 (0.83)	0.108 (1.43)	0.048 (0.83)	0.129 (1.77)
$SAFTA_{ijt}$ _LDC	-3.683 (9.97)**	-1.660 (5.26)**	-32.341 (9.97)**	-14.324 (5.22)**
$SAFTA_{ijt}$ _NLDC	-2.212 (1.98)*	-0.639 (2.28)*	-26.713 (2.23)*	-9.835 (2.16)*
$PMFTA_{ijt}$	1.985 (15.49)**	1.988 (14.52)**	12.024 (12.57)**	11.997 (13.19)**
$PCFTA_{ijt}$	0.682 (2.73)**	1.347 (2.88)**	3.340 (2.58)**	6.130 (3.11)**
$PSFTA_{ijt}$	0.952 (0.86)	-0.110 (0.60)	11.238 (0.73)	-3.212 (0.82)
$PIPTA_{ijt}$	0.710 (2.55)*	0.510 (1.17)	23.698 (2.56)*	14.813 (1.14)
$PMPTA_{ijt}$	-2.229 (10.77)**	-3.039 (14.01)**	-55.565 (10.85)**	-75.377 (13.74)**
CB_{ij}	-1.720 (6.66)**	-0.508 (0.97)	-1.728 (6.66)**	-0.443 (0.94)
CL_{ij}	0.571 (3.99)**	-0.307 (1.99)*	0.569 (3.98)**	-0.332 (2.29)*
Cons	32.113 (0.40)	79.098 (1.15)	32.520 (0.41)	96.995 (1.34)

Note: Robust z statistics in parentheses. * Significant at 5%; ** significant at 1%.NB: Negative Binomial;PPML: Poisson pseudo-maximum-likelihood; i = Pakistan, j = Trade partners of Pakistan.
Source: Author's estimations.

Figure 2 illustrates the import patterns of all of the FTA partners of Pakistan during 2000-2013, covering the periods both pre-and post FTAs being in effect. It is clear that China and Malaysia have become increasingly important import destinations for Pakistan, especially after the signing of FTAs with these countries around post-

2004. Despite the increasing importance of FTAs, the effect of the other FTA partners, except SAFTA_NLDC is negligible, as reflected by the small changes in their coefficients. These findings are consistent with the estimation results of Table 6 above.

Figure 2: Import Trends of Major FTA Partners: 2000-2013



Source: Author's calculations from UN Comtrade database.

When total imports are further disaggregated into agricultural and manufacturing products, the results suggest that the relative importance of FTAs ranked by their effects is different across products (Table 7). Note that the estimates in Table 7 are tariff gap-based estimates. Agriculture and manufacturing estimation results are not the same under both DV and TG estimation approaches with few exceptions (see Table 7 for TG estimation results). In agricultural imports, PIPTA is the most important; followed by PMFTA and PCFTA (all of which are significant at the one percent level, as shown in Column B of Table 7). On the other hand, for manufacturing imports PMFTA and PCFTA have the largest significant effect. However, PSFTA, PIPTA and PMPTA are negative and significant for manufacturing imports due to the low tariff margin under these FTAs and the limited number of products under tariff concessions (see Column D of Table 8).

Table 8: Estimation Results of Agricultural and Manufacturing Imports (Tariff Gap Approach)

	Agriculture		Manufacturing	
Variables	NB Column A	PPML Column B	NB Column C	PPML Column D
$\ln GDP_{it}$	4.002 (1.07)	6.161 (1.35)	5.188 (1.60)	6.366 (4.18)**
$\ln GDP_{jt}$	0.767 (17.36)**	0.817 (10.58)**	1.047 (17.37)**	0.971 (32.31)**
$\ln dist_{ij}$	-1.996 (12.25)**	-1.926 (7.05)**	-1.970 (15.50)**	-0.746 (7.42)**
$\ln POP_{it}$	-8.298 (0.78)	-13.306 (1.05)	-8.120 (0.92)	-12.004 (2.88)**
$\ln POP_{jt}$	0.379 (5.60)**	-0.223 (2.90)**	0.104 (1.77)	-0.203 (4.42)**
$\ln RER_{ijt}$	-0.165 (0.67)	0.004 (0.04)	0.109 (2.66)**	0.215 (3.78)**

$SAFTA_{ijt}$ _LDC	-38.368 (7.11)**	-17.145 (4.18)**	-25.862 (7.18)**	-16.863 (8.99)**
$SAFTA_{ijt}$ _NLDC	-26.687 (2.49)*	-3.370 (0.60)	-25.898 (1.99)*	-10.741 (3.44)**
$PMFTA_{ijt}$	15.018 (10.91)**	16.936 (11.17)**	6.895 (5.42)**	6.278 (7.71)**
$PCFTA_{ijt}$	-6.202 (2.66)**	8.107 (2.76)**	4.691 (3.57)**	3.286 (2.92)**
$PSFTA_{ijt}$	30.272 (1.20)	-3.849 (0.43)	0.406 (0.03)	-11.435 (3.52)**
$PIPTA_{ijt}$	40.781 (3.24)**	63.613 (4.99)**	-10.830 (0.86)	-41.084 (3.82)**
$PMPTA_{ijt}$	-29.260 (5.00)**	-55.728 (7.39)**	-111.632 (9.50)**	-122.305 (12.08)**
CB_{ij}	-2.245 (5.31)**	-2.324 (3.68)**	-1.174 (3.82)**	0.636 (2.02)*
CL_{ij}	0.199 (1.07)	0.033 (0.17)	1.261 (5.58)**	-0.461 (4.18)**
Cons	65.512 (0.60)	112.999 (0.89)	27.678 (0.32)	67.903 (1.63)

Note: Robust z statistics in parentheses.* Significant at 5%; ** significant at 1%. NB: Negative Binomial; PPML: Poisson pseudo-maximum-likelihood; i = Pakistan, j = Trade partners of Pakistan.
Source: Author's estimations.

Table 9 focuses on the sign of coefficients associated with six FTAs when the product is further disaggregated up to the 1 digit SITC. The positive (+) and the negative (-) signs shown in Table 8 indicate that the coefficient associated with the FTA is positive (negative) and statistically significant at the five per cent or one per cent levels. From Table 8 we see that the effect of FTAs is mixed across products and FTAs. For all products a positive effect is found for PMFTA and PCFTA, except in the case of SITC 1 (beverages and tobacco) due to the fact that Pakistan offers minimum tariff concessions on these products imported from Malaysia and China and so their demand is less in Pakistan, as indicated by the negative sign observed. For both FTAs, the coefficients tend to be high in SITC 4, 5 and 6, where most products are raw materials/production inputs. On the other hand, SITC 1 and 8 are positive for SAFTA_LDC because Pakistan offers quite high tariff concession rates to LDCs compared to NLDCs. However, with SAFTA most of the SITC codes yield negative signs which make the overall effect of SAFTA negative (i.e. imports from SAFTA members into Pakistan are negatively correlated with its income level). It is also evident from Table 8 that the import demand of Pakistan for manufacturing products from PSFTA, PIPTA and PMPTA is negative. Thus, ensuring the overall negative effects of PSFTA, PIPTA and PMPTA. Finally, for PIPTA it is the high demand of SITC 3 (mineral fuels, lubricants and related materials) which makes the PIPTA effect positive for agricultural products (for the magnitudes of coefficients of Table 9 see Appendix Table A).

Table 9: Import Enhancing Effects of FTAs Involving Pakistan

SITC– Codes	SAFTA (LDC)	SAFTA (NLDC)	PMFTA	PCFTA	PSFTA	PIPTA	PMPTA
0 – Food and live animals	-	+	+	+	+	+	-
1 – Beverages and tobacco	+	-	-	-	0	-	0
2 – crude materials, inedible, except fuels	+	+	+	+	+	+	-
3 – Mineral fuels, lubricants	0	-	+	+	0	+	0

4 – Animal and vegetable oils, fats and waxes	-	-	+	+	0	-	0
5 – chemicals and related products , n.e.s.	-	-	+	+	_	-	-
6– Manufactured goods classified chiefly by material	-	-	+	+	_	-	-
7 – Machinery and transport equipment	-	-	+	+	_	-	-
8 – Miscellaneous manufactured articles	+	-	+	+	+	-	-

Note: + means export enhancing effect of FTAs and – means export reducing effect of FTAs.
Source: Author's compilation.

For other than FTA variables in the gravity equation model (as shown in Table 7), the imports of Pakistan positively correlate with GDPs and are negatively responsive with the distance variable, as expected theoretically. Both the GDP variables are found to have a highly significant relationship with the expected signs. However, GDP_i is somewhat larger than GDP_j, indicating that the income level of a home country is a more crucial factor in determining imports. The distance variable is significant even at the 1 % level and carries the expected negative sign, which indicates that when the distance between Pakistan and country j increases, the bilateral trade between the two countries decreases. Alternatively, this demonstrates that Pakistan imports less from geographically remote countries.

Despite having significant trade potential with the neighboring countries, Pakistan is conducting negligible trade with them. Hence, imports of Pakistan are negatively correlated with the common border (CB) dummy variable (negative in both NB and PPML estimation, but significant only in the NB estimation). The negative coefficient of the border dummy indicates that Pakistan tends to import less from its neighboring countries and this can be attributed to the historical political conflicts between the two main partners in the region, i.e. India and Pakistan (Khan, 1999). Furthermore, much of the border trade between Pakistan and common border countries is underground and unrecorded (State Bank of Pakistan, 2008). Hence, we can say that Pakistan is not in a desirable trade relationship with its neighboring countries. This explains why the CB dummy yields a negative impact on its trade (although this finding is contrary to both expectations and common wisdom). The dummy for common language (CL) is statistically significant at both one percent and five percent in NB and PPML estimations, respectively. Here only NB yields the expected positive sign for the CL variable. RER is positive, but found to be statistically insignificant. This means that RER is insignificant in affecting the imports of Pakistan. Moreover, the magnitude of coefficient is rather small. This could be because Pakistan has to import machinery items (manufacturing goods) due to the low industrialization of the country, irrespective of any currency devaluation. Moreover, the tariff concessions on these goods are larger compared to agricultural goods, which explain why RER matters less in the case of Pakistan's import determination.

5. Conclusion and Policy Inferences

This paper has examined the effects of FTAs on imports, using Pakistan as a case study. The effects of FTAs are measured by the differences between MFN and preferential tariff rates (tariff gaps), as well as the zero-one binary variable. Our results suggest that the coefficients associated with FTAs are positive and significant only for Malaysia and China, while they are negative and significant only for PMPTA (Mauritius). The results are insignificant in terms of Sri Lanka (PSFTA) and Iran (PIPTA).

With respect to agricultural imports, PIPTA is the most important trade agreement; followed by PMFTA and PCFTA. On the other hand, for manufacturing imports, it is PMFTA and PCFTA which recorded the largest significant effects, while PSFTA, PIPTA and PMPTA show negative effects due to the low tariff margins prevailing under these FTAs and the inclusion of a limited number of products under tariff concessions. At the 1-digit SITC benchmark, the effect of FTAs is mixed across products and FTAs. A positive effect is mostly found for PMFTA and PCFTA and the coefficients tend to be high in SITCs 4, 5 and 6, where most products are raw materials/production inputs.

Interestingly, the way FTA is measured (either by binary dummy variable or tariff gap) affects the magnitude of the estimates. The effect of FTAs tends to be higher when FTAs are measured by tariff gaps in the case of Pakistan's imports. Moreover, the tariff gap approach to estimating FTAs impact is more theoretically favorable in capturing the effect of an FTA; this implies that analysis based only on binary dummy variables, which most studies have applied, tends to underestimate the impact of FTAs.

Three inferences can be drawn from this study. First, the way in which an FTA is measured (either by binary dummy variable or tariff gap) affects the magnitude of estimates. Heavily relying on the dummy variable potentially misleads considerations concerning the import enhancing effects of FTAs. In addition, analyzing imports at the disaggregate level is beneficial since the impact of FTAs across products is different. Second, the importance of ROOs has increased with the proliferation of FTAs around the world. They are widely considered as an economic instrument that work to offset the benefits of FTAs as they increase production costs. Therefore, the implementation of ROOs should not create new costs for the firms involved in particular trade relationships. Third, trade among South Asian economies has long suffered from the prevailing two-sided enmity between Pakistan and India, which has consequently hindered the progress of free trade across South Asia. In this regard, the ongoing animosity between Pakistan and India must come to an end in order to allow trade to prosper, not only between these two neighboring countries, but also for the benefit of other South Asian nations. Inferences drawn from this study, especially for the first and second points, are relevant for other developing countries, including Thailand, in which a number of FTAs are actively being negotiated and signed.

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Appendix A

Table A: Estimation Results of Disaggregated Imports
(PPML using TG Approach)

Variables	SITC 0	SITC 1	SITC 2	SITC 3	SITC 4	SITC 5	SITC 6	SITC 7	SITC 8
$\ln GDP_{it}$	5.829	17.753	4.606	2.450	9.271	3.065	6.465	8.298	4.224
	(1.89)	(3.09)**	(2.20)*	(0.36)	(1.03)	(1.24)	(3.61)**	(4.86)**	(1.94)
$\ln GDP_{jt}$	0.085	-0.178	0.469	1.182	-0.108	0.765	0.567	1.309	1.213
	(1.65)	(2.51)*	(16.17)**	(5.81)**	(1.54)	(14.61)**	(16.14)**	(21.42)**	(22.02)**
$\ln dist_{ij}$	0.066	1.081	-0.390	-4.560	0.179	-1.114	-0.428	-0.449	-0.252
	(0.48)	(4.41)**	(3.83)**	(4.93)**	(1.23)	(7.57)**	(4.50)**	(3.57)**	(2.00)*
$\ln POP_{it}$	-11.121	-38.502	-6.755	-3.597	-24.451	-3.754	-11.576	-16.369	-5.511
	(1.25)	(2.39)*	(1.18)	(0.19)	(1.01)	(0.53)	(2.41)*	(3.20)**	(0.93)
$\ln POP_{jt}$	0.527	0.512	0.171	-0.353	0.620	-0.164	0.163	-0.479	-0.624
	(6.08)**	(4.37)**	(3.42)**	(3.39)**	(4.06)**	(3.31)**	(3.31)**	(5.61)**	(7.90)**
$\ln RER_{ijt}$	-0.038	-0.927	0.048	-0.039	1.156	0.139	0.192	0.307	0.253
	(0.77)	(1.88)	(0.46)	(0.24)	(2.48)*	(1.91)	(3.71)**	(1.93)	(3.17)**
$SAFTA_{ijt}$ _LDC	-7.138	75.937	5.260	0.000	-159.123	-57.534	-12.161	-60.628	11.546
	(2.71)**	(7.53)**	(2.21)*	(.)	(17.48)**	(10.91)**	(8.67)**	(7.41)**	(4.35)**
$SAFTA_{ijt}$ _NLDC	3.272	-201.566	4.616	-77.521	-154.993	-6.426	-8.427	-50.734	-16.071
	(1.30)	(3.98)**	(1.63)	(3.20)**	(2.79)**	(1.99)*	(3.10)**	(2.60)**	(3.66)**
$PMFTA_{ijt}$	2.994	-15.573	3.775	0.409	109.305	5.306	6.536	8.147	7.477
	(2.99)**	(3.19)**	(4.88)**	(0.10)	(11.05)**	(4.72)**	(12.80)**	(5.53)**	(7.82)**
$PCFTA_{ijt}$	0.245	-24.822	1.335	14.775	10.028	2.835	6.152	1.881	2.688
	(0.18)	(1.91)	(1.27)	(1.84)	(0.82)	(3.06)**	(3.31)**	(2.15)*	(2.11)*
$PSFTA_{ijt}$	16.575	0.000	17.929	0.000	0.000	-18.797	-5.699	-17.767	124.689
	(1.70)	(.)	(6.62)**	(.)	(.)	(10.21)**	(2.65)**	(0.35)	(4.93)**
$PIPTA_{ijt}$	4.315	-42.612	34.802	90.599	-353.931	-6.797	-38.257	-139.704	-340.624
	(0.52)	(1.72)	(7.26)**	(2.55)*	(2.65)**	(1.17)	(1.93)	(8.22)**	(9.12)**
$PMPTA_{ijt}$	-121.119	0.000	-51.780	0.000	0.000	-101.923	-1,854.45	-875.956	-44.491
	(33.28)**	(.)	(7.77)**	(.)	(.)	(8.07)**	(5.60)**	(5.52)**	(3.44)**
CB_{ij}	0.203	-1.249	-0.489	-6.690	-5.374	0.048	0.326	1.622	2.730
	(0.62)	(2.35)*	(1.60)	(2.58)**	(11.63)**	(0.14)	(1.06)	(4.18)**	(7.39)**
CL_{ij}	0.870	-0.024	0.865	-0.661	-1.301	-0.266	-0.522	-0.627	-0.142
	(4.79)**	(0.10)	(7.65)**	(0.85)	(4.64)**	(1.79)	(4.02)**	(5.04)**	(1.00)
Cons	67.004	281.040	15.519	37.699	229.869	2.747	57.445	93.363	-7.460
	(0.72)	(1.70)	(0.28)	(0.20)	(0.97)	(0.04)	(1.23)	(1.66)	(0.13)

Note: Robust z statistics in parentheses.* Significant at 5%; ** significant at 1%. PPML: Poisson pseudo-maximum-likelihood; i = Pakistan, j = Trade partners of Pakistan.The estimates of above table are based on tariff gap measure.
Source: Author's estimations.