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Bilateral Free Trade Agreements (FTAs) for Trade Promotion: Boon or Bane for Pakistan?

Farhat Mahmood

Pakistan Institute of Development Economics
Islamabad, Pakistan

E-mail: publications@pide.org.pk
Website: http://www.pide.org.pk
Fax: +92-51-9248065

Designed, composed, and finished at the Publications Division, PIDE.

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Farhat Mahmood
Pakistan Institute of Development Economics, Islamabad.

PAKISTAN INSTITUTE OF DEVELOPMENT ECONOMICS
ISLAMABAD
2022

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ABSTRACT

This study examines the impacts of in-effect Free Trade Agreements (FTAs) on exports and 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. To deal with zero export flows, our econometric procedure in this study uses the method of Santos Silva and Tenreyro (2006) method where the dependent variable is the level of (real) export and import value whereas other independent variables are in logarithm. Poisson pseudo-maximum-likelihood (PPML) estimation is employed to avoid possible bias and inconsistent estimators resulting from using OLS estimation in the presence of heteroscedasticity problems. Negative binomial (NB) model, where the conditional mean and variance of the distribution are not necessarily equal, has also been used as a robustness check.

Results with Pakistan as an exporter suggest that Pakistan-China Free Trade Agreement (PCFTA) has the most significant stimulating effect on Pakistan's exports. In contrast, the effects of other FTAs are much smaller and not much different from each other. The effects of FTAs on agricultural products tend to be higher than on manufacturing sector products, suggesting the ability of firms to comply with imposed rules of origin in the former sector is better than in the latter one. On the other hand, results with Pakistan as an importer suggest that among six in-effect FTAs of Pakistan, only FTAs with Malaysia (PMFTA) and China (PCFTA) positively impact Pakistani imports. In agricultural imports, PIPTA (FTA with Iran) is the most important FTA for Pakistan; followed by PMFTA and PCFTA. However, PMFTA and PCFTA have the largest significant effect for manufacturing imports. At the 1-digit SITC, the effect of FTAs is mixed across products and FTAs. The positive effect is mainly found for PMFTA and PCFTA, and the coefficients tend to be high in SITC 4, 5, and 6, where most products are raw materials/production inputs.

Keywords: Exports, Imports, FTA, South Asia, Pakistan

1. INTRODUCTION

Opening international trade has become a norm in policy design worldwide to promote long-term economic growth. Until 2000, multilateral trade negotiation was governed by the General Agreement of Tariff and Trade (GATTs) and its successors, the World Trade Organisation (WTO), which was the core mechanism in reducing cross-border trade barriers, especially those in terms of tariffs. Since the new millennium, the mechanism to open up international trade has changed. The role of WTO has gradually become less significant, and it has been replaced by the proliferation of preferential trade agreements, widely known as the free trade agreements (FTAs). FTAs have grown at a phenomenal rate between 2000 and 2021, reaching 271 agreements by 2021 from 51 agreements in 2000 (ADB, 2014).[1] Halting speed of WTO negotiations, including the failure of the Seattle Ministerial meeting of WTO, popularised preferential trade agreements. Many countries joined such agreements due to political factors to enhance cross-border cooperation, increase regional security, and resist the domination of big powers in world trade.[2]

South Asia has been considered the least integrated region globally despite attempting to liberalise its trade through numerous trade agreements. It has long been argued that the limited success of South Asia to liberalise regional trade was due to a lack of adequate attention to improving its main trade facilitation measures.[3] Like elsewhere, several attempts were initiated in Asia to boost South Asian economic integration through various free trade agreements (FTAs). Even though South Asia is relatively a latecomer in the race of maximising FTAs, its catching-up speed is phenomenal. Among South Asian countries, Pakistan stands out as an example. The number of FTAs signed and/or under negotiation by Pakistan increased from none to 32 agreements in 2021.[4]

In contrast to the WTO, the FTA-led liberalisation is discriminatory and conditional. Preferential tariff rates offered under an FTA are directed towards members only, i.e., discriminatory basis with the expectation to boost trade among members. Since, under an FTA, tariffs toward non-members can be different, Rules Of Origins (ROOs) are imposed to prove the origin of the imported goods to determine their eligibility for tariff concessions/eliminations.

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

A free trade agreement (FTA*)* reduces barriers to imports and exports between countries by eliminating all or most tariffs, quotas, subsidies, and prohibitions.

[2] See Bhagwati, 1993; Bhagwati and Panagariya, 1996; Bergsten,k 1996; Krugman and Venables 1993.

[3] https://openknowledge.worldbank.org/handle/10986/5991

[4] https://aric.adb.org/fta-country.

As suggested in several previous studies,[5] compiling ROOs is costly and could discourage the use of FTAs. Therefore, the impacts of an FTA on trade are 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 ROOs imposed). Moreover, when an FTA of developing countries includes a long list of sensitive products, its implementation becomes rather complex, making the net impact on trade ambiguous? Under the agreement, trade barriers (both tariff and non-tariff) among members would be eliminated according to an agreed schedule to enhance trade among members.[6] While FTA proliferation continues, the effect of an FTA on trade remains an open empirical question to be tested. However, several empirical studies have examined the effects of FTAs on trade.

FTAs could generate the positive impacts by creating incentives for firms to indulge more in international trade, e.g., FTAs offer tax incentives to trading firms which consequently enhance firms' productivity by inducing tougher competition and cheaper imported inputs and this brings improvement in quality of products, larger economy of scale, enhancing variety of products and stimulus the investment climate of the country (Hoekman, 1997). However, the impacts of FTA on trade have remained ambiguous so far. However, some empirical studies point out the negative impacts of FTAs that eventually retard international trade. This includes the role of ROO,[7] hub and spoke model, varying country size, lack of supportive institutions and good governance, inefficient allocation of resources to the needy sectors, as well as limited movement of factors of production under the regime of free trade (Schiff, 1997 and Wonnacott, 1997). Signing an FTA and the induced trade opportunity does not always go hand in hand, especially when FTAs become additional trade barriers and discourage firms from materialising opportunities. Therefore, this is a worthy subject to be empirically examined to know the answer to the question—Does the world really need FTAs?

2. ANALYSIS OF PAKISTAN'S FTAs

In analysing the impacts of FTA on trade, most of the previous studies, with few exceptions introduced a zero-one dummy variable in the gravity equation over and above the standard controlling variables such as Gross Domestic Product (GDP) of home and host countries and geographical distances. In most of these studies, 1 is assigned to the dummy when an FTA in interest was signed and zero otherwise.[8] This practice seems problematic when an FTA takes time to have a full effect. For example, ASEAN Free Trade Area (AFTA) was signed in 1990 but took 15 years to implement substantially. Therefore, using the year the agreement was signed would be misleading. It would be further misleading when there is a mix of preferential and free trade agreements. The former involves only partial liberalisation where the ultimate preferential tariff rate is not zero, while the ultimate tariff rate of the latter is zero.

[5]For example, Krishna, 2006; Kawai, 2005, Wignaraja, et al. (2010).

[6]In some cases, details in an FTA cover investment facilitations and regulation coherences, all of which aim to promote trade and investment among members.

[7]How ROO are designed and implemented play a critical role in determining the trade opportunity from FTAs but its compilation is costly.

[8]For example, Elliott and Ikemoto, 2004; Cheng and Tsai, 2008.

To the best of our knowledge, Manchin and Balaoing, 2007 and Obake and Urata, 2013 are the exceptions for using FTAs as a dummy variable. In their application of the gravity model in examining the effect of an FTA, the difference between Most-Favoured Nation (MFN) and preferential tariffs is used instead of the dummy variable used in other studies. The tariff difference tends to be a proper measure than the binary dummy variable, as it can capture changes in tariff rate over the implementation of FTAs and different reduction rates in each FTA signed. It points out that to systematically analyse the impact of FTA in stimulating exports and imports, a proper measure of an FTA such as tariff gap is being used to analyse Pakistan's FTAs.

In this study, the tariff gap measure has been used to analyse six in-effect FTAs[9] of Pakistan, namely the South Asian Free Trade Agreement (SAFTA),[10] Pakistan-China FTA (PCFTA), Pakistan-Malaysia FTA (PMFTA), Pakistan-Sri Lanka FTA (PSFTA), Pakistan-Iran Preferential Trade Agreement (PIPTA) and Pakistan-Mauritius Preferential Trade Agreement (PMPTA).

3. TARIFF GAP CALCULATION

The tariff reduction in each FTA is scheduled over the years, and the tariff concessions are different for each product. To summarise 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 in each product and FTA.

The formula for calculating the tariff gap is as follows:

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

Where TM is the tariff margin/tariff gap, the tariff gap is then summarised by a 1-digit SITC and is shown in Figures 1 and 2 (for exports and imports, respectively) for each FTA. Note that the tariff gap for agricultural products is calculated from the tariff gap of products in SITC 0-4, while the tariff gap for manufacturing products is calculated from the tariff gap of products in SITC 5-8.

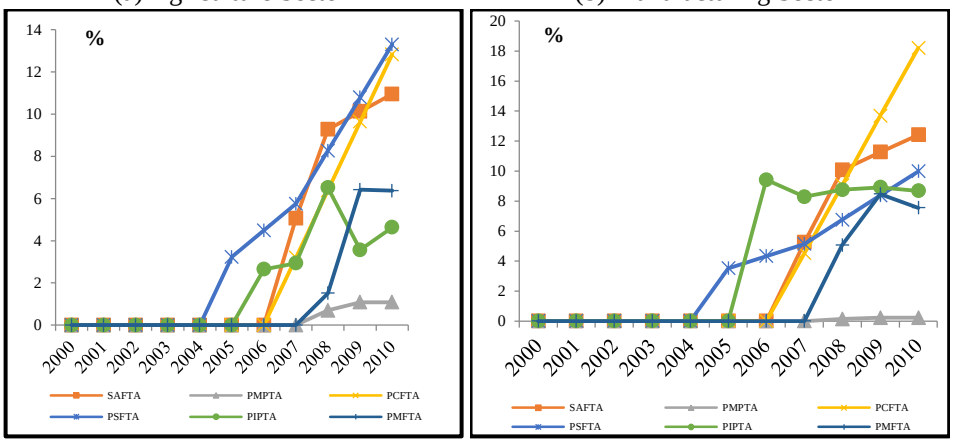
From an export perspective (i.e., Pakistan being treated as an exporter), the tariff gap of SAFTA shows a sharp increase in the tariff margin in both sectors. Later on, the tariff gap of the manufacturing sector dominates over the agriculture tariff gap (Figure 1). Mauritius indicates a slow rise and an almost constant trend in both sectors. For both Malaysia and Iran, the tariff gap of the manufacturing sector dominates over the agriculture sector, indicating that these counties provide more tariff incentives to the manufacturing products in Pakistan. The gap for both countries was more comprehensive in the early years and then tended to contract during later years of the agreement (Figure 1).

[9] As of 2021 there are 9 in-effect FTAs of Pakistan.

[10] In recent years, negotiation went beyond market access. For example, in late 2012, South Asian Association for Regional Cooperation Agreement on Trade in Services entered into force in late 2012 but it has not been fully implemented, ADBI, 2013.

Fig. 1. Tariff Gap Granted to Pakistan under Selected FTAs

(a) Agriculture Sector (b) Manufacturing Sector

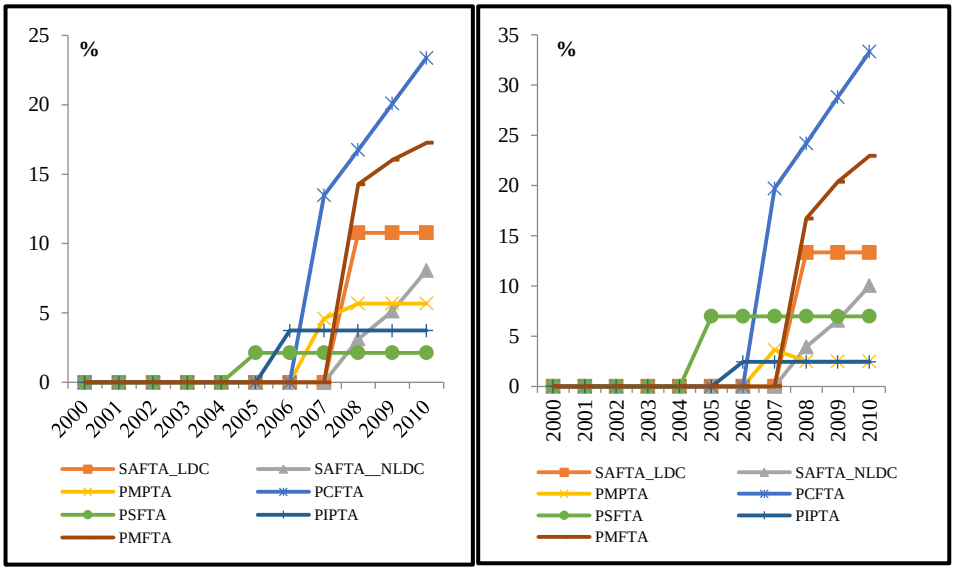


Source: Authors' calculations.
Note: Tariff gap for each FTA is calculated by taking an average of tariff gap in each product category.

Like exports, the tariff concession granted by Pakistan to its FTA partners (i.e., Pakistan being treated as an importer) is summarised in Figure 2. The tariff gap is calculated in detail for each product, e.g. more than four thousand products for SAFTA and more than three thousand products for PCFTA, using the formula for tariff gap as shown in Equation 4, and then summarised by 1-digit SITC to match with the export data.

Fig. 2. Tariff Gap Granted by Pakistan under Selected FTAs

(a) Agriculture Sector (b) Manufacturing Sector



Source: Authors' calculations.
Note: Tariff gap for each FTA is calculated by taking average of tariff gap in each product category.

When comparing all in-effect FTAs it is evident (Figure 2) that the tariff gap is highest for PCFTA in Pakistan's agriculture and manufacturing sectors. Following PCFTA, the next is PMFTA indicating that Pakistan grants more tariff concessions to Chinese and Malaysian agriculture and manufacturing products. Regarding SAFTA, Pakistan has a different tariff reduction schedule for LDCs (Least Developing Countries) and non-LDCs members of SAFTA.[11] The tariff gap of the non-LDCs manufacturing sector dominates over agriculture and tends to rise in both sectors. In the agriculture sector, the lowest tariff gap is for PSFTA, while the lowest tariff rate in manufacturing is for PIPTA. Finally, both PSFTA and PIPTA show a steady changing trend of tariff gap in both sectors (see Figure 2).

All in all, two remarks can be made about FTAs involving Pakistan. Firstly, tariff reduction schedules for the in effect FTAs are complicated, i.e., they are different across FTAs and periods. Using zero-one dummy variable capturing the enhancing trade effect of FTAs would be problematic. Secondly, when comparing all in-effect FTAs, it is evident that tariff reduction is different between agricultural and manufacturing products.

4. EMPIRICAL MODEL SPECIFICATION

The well-known gravity equation is employed to assess the trade trade-enhancing effect of FTAs.

The basic form of the model is expressed in Equation 5:

$$\ln t_{ijt} = \ln \alpha + \beta_1 \ln GDP_{it} + \beta_2 \ln GDP_{jt} + \beta_3 \ln dist_{ij} \quad \ldots \quad \ldots \quad \ldots \quad (2)$$

Where t_{ijt} is trade value between countries *i* and *j* at time *t*, GDP_{it} and GDP_{jt} are Gross Domestic Products of countries *i* and *j*, respectively, $dist_{ij}$ is the geographical distance between countries *i* and *j*.

By the nature of this study, the GDP of Pakistan and trading (export and import) partners are introduced separately, as they could have different impacts on trade Majeed, 2007; Jugurnath, et al. 2007; Clarete, 2003. The distance variable is introduced to represent any trade barriers naturally caused by transportation costs and the like.

In addition, there are other factors affecting trade volume, captured by the parameter $\beta 0$. From literature, these factors could be the population of both Pakistan and its trading partners (POP_{it} and POP_{jt}, respectively), tariff, and two dummy variables, i.e., common borders (*CB*) and common language (*CL*). I have included these variables in the analysis. The effect of population on trade flows is strictly indeterminate Papazoglou, 2007. It can be either trade enhancing or inhibiting. A large population may indicate a large resource endowment, self–sufficiency, and less reliance on international trade. If this effect dominates, then a negative relation occurs. On the other hand, it is possible that a large domestic market (population) promotes the division of labour and, thus, creates opportunities for trade in a broader variety of goods.

For *CB* and *CL*, the binary dummies are equal to one when Pakistan and its trading partners share the common border and common language, respectively, and zero otherwise. To examine the export and import enhancing effect of an FTA, this study uses a tariff gap measure, which is different from the previous studies where a binary (zero-

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

one) is used. Using such a variable is under the implicit assumption that an FTA takes full effect immediately. It is somewhat restrictive for FTAs signed among developing countries in which tariff reduction schedules are complicated, associated with long implementation periods and some exceptions. However, the tariff gap used in this paper is more theoretically favourable in capturing the effect of an FTA. It does not only reflect a magnitude of preferential tariff offered but also can vary across years as well as product lines. The coefficient of the tariff gap is expected to be either positive or zero. When the coefficient turns positive, it implies that an FTA in interest positively affects Pakistan's exports. Otherwise, an FTA would not have any significant effect on exports. For comparison, the binary dummy variable is also applied in our study; one is assigned when FTA in interest is in effect and zero otherwise.

In addition to the tariff gap, for the export side, the actual tariff rate of all trading partners imposing on Pakistan's exports (Tariff_{ijt}) is included in the model. As mentioned earlier, this variable is included not only because of its effect on exports and imports but also to redress the bias of FTA enhancing effect on exports. The coefficient is expected to be negative, implying exports from Pakistan to a trading partner would become more when the trading partner lowers the tariff rate; on the other hand, imports of Pakistan from its trading partner would become more when Pakistan lowers the tariff rate, other things being constant.

As addressed in previous empirical studies, the estimation must consider the price effects, referred to as multilateral resistance. As argued in Baier and Bergstrand, 2001, Rose, 2000 and Vandenbussche and Zanardi, 2010, since all variables are measured in real terms, the multilateral resistance can be addressed by introducing bilateral Real Exchange Rate (RER_{ij}).

An increase in RER_{ij} refers to as real currency depreciation. For exports, the coefficient associated with this variable is expected to be positive, implying exports from Pakistan to its trading partner Country j would become more when RER_{ij} depreciates. By contrast, for imports, the coefficient associated with this variable is expected to be negative, i.e., imports of Pakistan from its partners' j would become less when the real currency of Pakistan with Country j depreciates.

Note that to consider the heterogeneous nature of tradable products Jongwanich, 2010, the total export and import are further disaggregated. The total export and import are separated into two main product groups, agriculture (sum of SITC 0 to 4) and manufacturing (sum of SITC 5-8), to examine whether the effect of FTAs is different or not.

All in all, the empirical equations of exports and imports used in the study are as follows;

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

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

Where,

X_{ijt} = (real) bilateral exports from Pakistan to country *j* at year *t* with four alternatives;

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

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) Exports at the SITC-1-digit level of disaggregation (SITC 0 – 8)

GDP_{it} = (real) Gross domestic product of Pakistan in year *t*
GDP_{jt} = (real) Gross domestic product of Country *j* in year *t*
$dist_{ijt}$ = distance between Pakistan and Country *j* in year *t*
POP_{it} = Population of Pakistan in year *t*
POP_{jt} = Population of Country j in year *t*
RER_{ijt} = Bilateral real exchange rate between Pakistan and Country j in year *t.*
CB_{ij} = Common border dummy with Pakistan which equals to one when Country j shares the border, zero otherwise.
CL_{ij} = Common language dummy with Pakistan which equals to one when Country j uses the same language (English), zero otherwise.
$(Tariff_{ijt})$ = MFN tariff rates between Pakistan and country j in year *t.*
$SAFTA_{ijt}$ = SAFTA variable proxied by two alternatives;

(1) Tariff gap Pakistani exporters receive from other SAFTA members in year *t.*
(2) Zero-one dummy variable; one when export destination belongs to SAFTA in and after 2006; zero otherwise.

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

(1) Tariff gap Pakistani exporters receive from China in year *t.*
(2) Zero-one dummy variable; one when the export destination is China in and after 2007; zero otherwise.

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

(1) Tariff gap Pakistani exporters receive from Malaysia in year *t.*
(2) Zero-one dummy variable; one when the export destination is Malaysia in and after 2008; zero otherwise.

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

(1) Tariff gap Pakistani exporters receive from Sri-Lanka in year *t.*
(2) Zero-one dummy variable; one when the export destination is Sri Lanka in and after 2005, zero otherwise.

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

(1) Tariff gap Pakistani exporters receive from Iran in year *t.*
(2) Zero-one dummy variable; one when the export destination is Iran in and after 2006; zero otherwise.

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

(1) Tariff gap Pakistani exporters receive from Mauritius in year *t.*
(2) Zero-one dummy variable; one when export destination is Mauritius in and after 2007; zero otherwise.

For imports (Equation 9);

$SAFTA_{ijt}$[12] = 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 was 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 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 was Pakistan in 2005 and after, zero otherwise.

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

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

[12]For imports analysis SAFA is further sub-divided into SAFA for LDCs and SAFTA for NLDCs.

Pakistan's bilateral exports/imports to/from 214 trade partners are from the United Nations Commodity Trade Statistics Database (UN COMTRADE database) for 2000-10. The consumer price index of the US is used as a deflator to obtain real export value. The distance information is taken from the Centre d'Etudes Prospectives et d'Informations Internationales (CEPII) database, whereas common border and common language data are from the CIA-World Fact book. Real GDPs are taken from World Development Indicators and Global Development Finance (World Bank). Accurate exchange rate data is from International Financial Statistics, IFS. As for the component of Tariff Margin (TM) variables, the data of MFN is received from United Nations Conference on Trade and Development (UNCTAD/WTO) and the ministry of commerce of Pakistan. The details of tariff concession and schedules for each FTA and each product have also been taken from the Ministry of Commerce, Pakistan. Tariff rates data are obtained from World Integrated Trade Solution (WITS).

Equations (3) and (4) are estimated by the Gravity model.

To deal with zero export flows, our econometric procedure in this study uses the method of Santos Silva and Tenreyro, 2006 where the dependent variable is the level of (real) export value and import value (Equations 3 and 4, respectively), whereas other independent variables are in logarithm. Poisson Pseudo-Maximum-Likelihood (PPML) estimation is employed to avoid possible bias and inconsistent estimators resulting from using OLS estimation in heteroscedasticity problems. Its estimates are consistent in fixed effects that 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 the exporter and by the importer Freenstra, 2001.

On the other hand, there is a growing concern about a restrictive assumption under PPML estimation where the conditional mean and variance of the distribution are equal. In particular, Burger, et al. 2009 argue for using a more generalised version, the 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 as a robustness check.

5. EXPORTS ANALYSIS

Table 1 presents estimation results of total exports using both PPML and NB estimators. Two alternative measures of FTA effects, i.e., the binary dummy variable and tariff gap, are used. Generally, results from both estimation methods are resilient, with some exceptions. Hence, the following discussion will be based on PPML results. NB results will be discussed when relevant.

Most of the coefficients reach the theoretically expected sign. When an FTA effect is concerned, both the dummy variable and tariff gap yield similar results to a certain extent. All coefficients are statistically different from zero at 5 percent or better. PCFTA, PSFTA, PIPTA, PMFTA and PMPTA have a PCFTA, PSFTA, PIPTA, PMFTA and PMPTA have a positive effect on Pakistan's exports, regardless of the estimation methods and the FTA measure.

The effect of SAFTA on export is not statistically significant in PPML model but very significant and negative in NB one. The failure behind SAFTA might be attributed to the persistent political conflicts between two large markets of the region i.e., India and Pakistan, while cross-border smuggling is still huge in the region Hassan, 2001; Ashfaque, 1998.

Table 1

Estimation Results for Total Exports

	Binary Dummy		Tariff Margin	
	NB	PPML	NB	PPML
Variables	Column A	Column B	Column C	Column D
ln GDP_{it}	3.13	-0.19	3.27	0.41
	(1.75)**	(-0.09)	(1.82)**	(0.19)
ln GDP_{jt}	0.44	0.64	0.44	0.64
	(16.57)***	(18.63)***	(16.57)***	(18.66)***
ln $dist_{ij}$	-0.59	-0.67	-0.60	-0.65
	(-5.47)*	(-6.82)*	(-5.51)*	(-7.20)*
ln POP_{it}	-4.36	2.56	-4.69	1.02
	(-0.89)	(0.45)	(-0.96)	(0.17)
ln POP_{jt}	0.26	0.14	0.26	0.14
	(6.43)*	(3.43)*	(6.42)*	(3.45)*
ln POP_{ijt}	0.10	0.09	0.10	0.09
	(2.22)***	(1.44)*	(2.26)***	(1.60)**
$(\text{Tariff})_{ijt}$	-0.01	-0.01	-0.01	-0.01
	(-2.43)***	(-1.07)	(-2.35)***	(-1.02)
$SAFTA_{ijt}$	-0.72	-0.40	-0.07	-0.05
	(-2.43)***	(-1.16)	(-2.39)***	(-1.36)*
$PCFTA_{ijt}$	0.56	1.63	1.78	1.03
	(2.95)***	(4.00)***	(3.53)***	(3.60)***
$PMFTA_{ijt}$	0.19	0.50	0.03	0.07
	(1.63)**	(4.88)***	(1.66)**	(4.53)***
$PSFTA_{ijt}$	1.76	2.10	0.05	0.11
	(6.84)***	(8.23)***	(4.20)***	(4.56)***
$PIPTA_{ijt}$	1.03	2.23	0.20	0.22
	(4.45)***	(5.81)***	(6.66)***	(5.42)***
$PMPTA_{ijt}$	1.31	0.88	0.13	0.29
	(6.17)***	(4.56)***	(6.37)***	(6.13)***
CB_{ij}	-0.94	-1.78	-0.94	-1.64
	(-4.49)***	(-4.25)***	(-4.46)***	(-4.44)***
CL_{ij}	-0.03	0.93	-0.02	0.91
	(-0.18)	(8.81)***	(-0.14)	(9.07)***

Source: Authors' computation.

Note: number in the parentheses are -z statistics based on clustered standard errors; * Significant at 10 percent; ** significant at 5 percent, *** significant at 1 percent; NB = Negative binomial and PPML = Poisson Pseudo Maximum Likelihood.

i = Pakistan, j = Trade partners of Pakistan.

Interestingly, how FTA is measured (i.e., dummy or tariff gap) affects the magnitude of estimates. According to the dummy variable, the positive effect descends from PIPTA (the highest), followed by PSFTA, PCFTA, PMPTA, and PMFTA (the lowest). This is in contrast to when the tariff gap is concerned. The tariff gap results suggest that PCFTA has the largest export stimulating effect on Pakistan's exports. The

effect of other FTAs seems much smaller and not much different from each other. The coefficients associated with PSFTA, PIPTA, PMPTA and PMFTA are narrowly between 0.07 and 0.29 (Table 1).

When total export is disaggregated into agricultural and manufacturing products, the results suggest that the relative importance of FTAs ranked by their stimulating effect is different across products (Table 2). Estimates in Table 15 are tariff gap-based estimations. In agricultural exports, PCFTA is the most important, followed by PMFTA.

Table 2

Estimation Results for Agricultural and Manufacturing Exports

	Agriculture		Manufacturing	
	NB	PPML	NB	PPML
Variables	Column A	Column B	Column C	Column D
ln GDP_{it}	3.38	0.46	0.91	0.34
	(1.95)**	(0.22)	(0.45)	(0.15)
ln GDP_{jt}	0.44	0.63	0.55	0.68
	(17.37)***	(20.40)***	(18.42)***	(18.19)***
ln $dist_{ij}$	-0.61	-0.67	-0.37	-0.51
	(-5.42)***	(-7.99)***	(-3.12)***	(-4.99)***
ln POP_{it}	-5.06	0.97	0.28	0.84
	(-1.07)	(0.17)	(0.05)	(0.14)
ln POP_{jt}	0.27	0.14	0.18	0.14
	(6.55)***	(3.72)***	(4.01)***	(2.97)***
ln POP_{ijt}	0.10	0.10	0.09	0.12
	(2.36)***	(1.69)**	(1.89)**	(1.82)**
$(Tariff)_{ijt}$	-0.02	-0.01	-0.01	-0.02
	(-3.54)***	(-1.64)**	(-1.61)**	(-1.35)*
$SAFTA_{ijt}$	-0.04	-0.05	-0.02	-0.04
	(-1.21)*	(-1.25)*	(-0.58)	(-0.81)
$PCFTA_{ijt}$	1.23	0.69	1.95	0.06
	(3.53)***	(3.49)***	(1.25)*	(0.06)
$PMFTA_{ijt}$	0.25	0.41	-0.02	0.07
	(7.62)***	(6.84)***	(-0.62)	(1.58)**
$PSFTA_{ijt}$	0.07	0.14	0.07	0.10
	(4.85)***	(4.85)***	(4.93)***	(3.75)***
$PIPTA_{ijt}$	0.18	0.22	0.27	0.30
	(5.38)***	(5.28)***	(5.56)***	(4.64)***
$PMPTA_{ijt}$	0.03	0.08	-0.04	0.00
	(1.23)*	(3.39)***	(-2.20)***	(0.21)
CB_{ij}	-1.06	-1.60	-1.10	-1.65
	(-5.05)***	(-4.70)***	(-4.46)***	(-3.68)***
CL_{ij}	-0.02	0.90	-0.07	0.93
	(-0.15)	(9.15)***	(-0.35)	(8.22)***

Source: Authors' computation.

Note: Number in the parentheses are -z statistics based on clustered standard errors; * Significant at 10 percent; ** significant at 5 percent, *** significant at 1 percent; NB = Negative binomial and PPML = Poisson Pseudo Maximum Likelihood.

i = Pakistan, j = Trade partners of Pakistan.

The other threes (PSFTA, PIPTA, and PMPTA) are smaller, with coefficients between 0.08 – 0.22 (column B of Table 2). For manufacturing exports, PIPTA has the largest export stimulating effect. Other FTAs have a negligible effect as their coefficients are close to zero. The different results between agricultural and manufacturing export would be due to the difficulty in complying with rules of origin requirements in each FTA. As discussed earlier, rules of origin usually found in the FTAs involving Pakistan are regional value content requirements. The required content is between 40-55 percent. This seems complicated for manufacturing firms in Pakistan which are relative latecomers to industrialisation. They rely on imported raw materials and intermediates for their export business. Hence, it would be difficult to comply with such a rule and gain preferential tariffs as expressed in an FTA. By contrast, agricultural products would be much easier to comply with such a rule as their production nature is wholly obtained as their local content tends to be very high.

6. IMPORTS ANALYSIS

The gravity model of Pakistan's imports, Equation (4), has been estimated by taking all variables using both PPML and NB estimation methods.

In terms of FTA-specific effects, both the tariff gap and dummy variable yield similar results, but the magnitude of coefficients is much more significant in the case of tariff gap. From the estimated results, the coefficients associated with FTAs are positive and significant only for Malaysia (PMFTA) and China (PCFTA). At the same time, they are negative and significant for SAFTA and PMPTA (Mauritius). The results are insignificant in terms of Sri Lanka (PSFTA) and Iran (PIPTA). Note that, from the structure of FTAs, the products that Pakistani importers could import more through PMFTA and PCFTA are raw materials for which Pakistan tends to have a less comparative advantage. Interestingly, how FTA is measured (i.e., dummy variable or tariff gap) affects only the magnitude of estimates. The effect of FTAs tends to be higher when FTAs are measured by tariff gap. While the tariff gap is more theoretically favourable in capturing the effect of an FTA, this implies that analysis based on dummy variables tends to underestimate impacts of FTAs (Table 3).

The most significant effect of PMFTA is in line with the fact that Pakistan fulfills more than 95 percent of its import demand of refined palm oil, crude palm oil, RBD palm oil and coconut from Malaysia [Economic Survey of Pakistan, 2010]. Let's look at the import's import performance of Pakistan from Malaysia. It is noticed that only nine tariff lines comprised majorly of palm, coconut, and babassu oil products constituting about 78.28 percent of Pakistan's total imports from Malaysia in 2010. Pakistan import demand for these products was so high, and the import value of these nine items was US$ 426.4 million, which has increased four times to US$ 1.61 billion in 2010. To cater to the import demand and import surge, Pakistan offered a Margin of Preference on these nine line items with a 15-20 percent tariff reduction by 2010.

China has become a better FTA partner of Pakistan because of the elimination of trade barriers through FTA and the supportive attitude of the Government of Pakistan, resulting in a significant expansion of trade between both countries. The essential items of Pakistan's imports from China are machinery, mechanical appliances, and textile articles. These two categories comprise about 51 percent of all imports from China.

Table 3

Estimation Results for Total Imports

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

Robust z statistics in parentheses.

* Significant at 5 percent; ** significant at 1 percent.

Machinery and mechanical appliances maintained the top position, while textiles and textile articles replaced chemical products in the second position in 2007, accounting for about one-fifth of the total exports from China.

Pakistan's imports from SAARC countries are lower (Pakistan offers different tariff reduction schedule for SAFTA least developed countries and non-least developed countries. Hence in this study, two variables are used to indicate SAFTA members under

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 i.e., Pakistan and India. Moreover, SAARC countries' low levels of industrialisation, similar levels of development, and enormous volume of unrecorded trade might also contribute to poor results. On the other hand, efforts to promote regional integration and cooperation through SAARC have suffered greatly due to tensions and conflicts in the region.

The two possible reasons behind the significant negative coefficient of PMPTA can be the lowest tariff margin as compared to all other FTAs of Pakistan as shown above in this study. Most of the tariff concession products belongs to the textile sector, which has low demand in Pakistan, and many products are imported from China, which tends to have lower prices.

When total imports are further disaggregated into agricultural and manufacturing products, the results suggest that the relative importance of FTAs ranked by their effect is different across products (Table 4). Agriculture and Manufacturing estimation results are not the same under both DV and TG estimation approaches. In agricultural imports, PIPTA is the most important, followed by PMFTA and PCFTA (all of them are significant at a 1 percent level). On the other hand, for manufacturing imports, it is PMFTA and PCFTA, which have the largest significant effect. Whereas PSFTA, PIPTA, and PMPTA are harmful for manufacturing imports (column D of Table 4) due to low tariff margin under these FTAs and the limited number of products of tariff concession (see Table 4).

For other variables in the gravity equation model, imports of Pakistan are positively responsive to the GDPs and negatively responsive with the distance variable as expected theoretically. Both the GDP variables are found to be highly significant with the expected signs. However, GDP_i is quite bigger than GDP_j, indicating that the income level of the home country is a more crucial factor in determining imports. The distance variable is significant even at a 1 percent level and carries the expected negative sign which indicates that when 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 a trade potential with the neighboring countries, Pakistan has very low trade volumes with them. Hence, imports of Pakistan are negatively correlated with the CB dummy variable (negative in both NB and PPML estimation, but it is significant only in NB estimation). The negative coefficient of the border dummy indicates that Pakistan tends to import less from its neighboring countries. This can be attributed to the historical political conflicts between the region's two main partners, i.e. India and Pakistan. The dummy for Common Language (*CL*) is statistically significant at 1 percent and 5 percent in NB and PPML estimation respectively, but only NB yields the expected positive sign for CL variable. *RER* is positive but found statistically insignificant. It means that RER is insignificant in affecting imports of Pakistan.

Moreover, the magnitude of the coefficient is relatively small (Table 17). This could be because Pakistan has to import machinery items (manufacturing goods) due to the low industrialisation of the country, irrespective of the currency devaluation. Additionally, tariff concessions on these goods is larger when compared to agriculture goods, which explains why RER matters less in case of Pakistan's import determination.

Table 4

Estimation Results for Agricultural and Manufacturing Imports (Tariff Gap)

	Agriculture		Manufacturing	
	NB	PPML	NB	PPML
Variables	Column A	Column B	Column C	Column D
ln GDP_{it}	4.002	6.161	5.188	6.366
	(1.07)	(1. 35)	(1.60)	(4.18)**
ln GDP_{jt}	0.767	0.817	1.047	0.971
	(17.36)**	(10.58)**	(17.37)**	(32.31)**
ln $dist_{ij}$	-1.996	-1.926	-1.970	-0.746
	(12.25)**	(7.05)**	(15.50)**	(7.42)**
ln POP_{it}	-8.298	-13.306	-8.120	-12.004
	(0.78)	(1.05)	(0.92)	(2.88)**
ln POP_{jt}	0.379	-0.223	0.104	-0.203
	(5.60)**	(2.90)**	(1.77)	(4.42)**
ln RER_{ijt}	-0.165	0.004	0.109	0.215
	(0.67)	(0.04)	(2.66)**	(3.78)**
$SAFTA_{ijt}\_LDC$	-38.368	-17.145	-25.862	-16.863
	(7.11)**	(4.18)**	(7.18)**	(8.99)**
$SAFTA_{ijt}\_NLDC$	-26.687	-3.370	-25.898	-10.741
	(2.49)*	(0.60)	(1.99)*	(3.44)**
$PCFTA_{ijt}$	-6.202	8.107	4.691	3.286
	(2.66)**	(2.76)**	(3.57)**	(2.92)**
$PMFTA_{ijt}$	15.018	16.936	6.895	6.278
	(10.91)**	(11.17)**	(5.42)**	(7.71)**
$PSFTA_{ijt}$	30.272	-3.849	0.406	-11.435
	(1.20)	(0.43)	(0.03)	(3.52)**
$PIPTA_{ijt}$	40.781	63.613	-10.830	-41.084
	(3.24)**	(4.99)**	(0.86)	(3.82)**
$PMPTA_{ijt}$	-29.260	-55.728	-111.632	-122.305
	(5.00)**	(7.39)**	(9.50)**	(12.08)**
CB_{ij}	-2.245	-2.324	-1.174	0.636
	(5.31)**	(3.68)**	(3.82)**	(2.02)*
CL_{ij}	0.199	0.033	1.261	-0.461
	(1.07)	(0.17)	(5.58)**	(4.18)**
Cons	65.512	112.999	27.678	67.903
	(0.60)	(0.89)	(0.32)	(1.63)

Robust z statistics in parentheses.

* Significant at 5 percent; ** significant at 1 percent.

7. RECOMMENDATIONS

Three policy inferences can be drawn from this study.

Firstly, how FTA is measured (i.e. either by dummy variable or tariff gap) has affected the magnitude of the estimates. The effect of FTAs tends to be higher when FTAs are measured by the tariff gap in the case of Pakistan's imports. While the tariff gap is more theoretically favourable in capturing the effect of an FTA, this implies that analysis based only on a dummy variable, which most studies have applied, tends to underestimate the impacts of FTAs.

Secondly, the importance of ROO has increased with the proliferation of FTAs around the world. They are widely considered an economic instrument that works to offset the benefits of PTAs as they increase production costs.

Thirdly, trade among South Asian economies has long suffered from the two-sided hostility between Pakistan and India, which has slowed down the progress of free trade in South Asia.

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Pakistan Institute of Development Economics
Post Box No. 1091, Islamabad, Pakistan

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