Beyond Normalization of Trade Ties - A Pakistan – India Free Trade Agreement (FTA): A Stochastic Frontier Gravity Model (SFGM) Approach

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Abstract

Several studies have estimated a large bilateral trade potential and have emphasized on normalization of trade ties between Pakistan and India, the two largest economics in the South Asian region. However, this paper explores the possibility of bilateral trade beyond MFN (Most-favoured Nation) basis and examines the potential of a deeper economic integration through a Free Trade Agreement (FTA) between Pakistan and India. In the above context, this paper employs the Stochastic Frontier Gravity Model (SFGM) to quantitatively measure the influence of "behind the border" constraints on achieving Pakistan's maximum export potential towards India during 2013-15. Results confirm that Pakistan has a large unrealized export potential with India. They further indicate that the potential for an FTA appears to be significant, but contingent upon the effective reduction of "behind the border" constraints limiting Pakistan's export potential.

1. Introduction

This paper is an exploratory analysis of a potential Free Trade Agreement (FTA)[2] between Pakistan and India. Drawing on Kalirajan (2007), the Stochastic Frontier Gravity Model (SFGM) is used to quantitatively examine Pakistan's export potential with India and to identify and measure the impact of "behind the border" constraints that resist bilateral trade flows between the two countries. This study aims to be an original contribution to the existing

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[2] Kepaptsoglou et al (2010) explain that FTA are treaties between at least two or more countries to eliminate tariff and non-tariff barriers for a wide range of traded goods and services. The main objective is to significantly increase bilateral trade by relaxing or eliminating "existing institutional and economic barriers". FTAs have been a widely used to enhance trade between trading partners. For example, the North American Free Trade Agreement (NAFTA) between the United States, Canada and Mexico.

literature through investigating the potential of such a bilateral trade arrangement between Pakistan and India within the SFGM framework.

Since its introduction by Tinbergen (1962) and Linneman (1966), the gravity model has been widely used to identify factors constraining international trade flows and in measuring the impact of preferential trade agreements (PTAs) and free trade agreements (FTAs) on bilateral trade flows between countries. In predicting bilateral trade flows, the conventional gravity model estimation incorporates the respective 'economic size' and 'geographical distance' between two countries. It is now an established and widely used method of economic modelling due to its "considerable empirical robustness and explanatory power for describing trade flow" (Anderson 1979, Bergstrand 1985, Porojan 2001, Kalirajan and Bhattacharya 2009 & Kepaptsoglou et al 2010).

While moving beyond normalization of trade ties, the significance of analysing a bilateral FTA between Pakistan and India from is based on two perspectives. Firstly, as Kalirajan and Bhattacharya (2009) highlight, a key advantage of such an agreement is its reforming role in addressing trade liberalization policies within specific countries also referred to as 'behind the border' constraints. They argue that these country-specific constraints create a difference between the actual levels of trade flows from their potential levels with the country's trading partners also referred to as the "trade-gap". Hence, besides multilateral efforts, regional and bilateral economic cooperation also play a significant role in minimising this gap.

Secondly, Goh (2006) argues that the overarching consideration in adopting this approach to bilateral and regional trade should be one of 'national interest'. He elaborates that these interests not only include improving market access and securing a global competitive advantage but also extend to promoting deeper economic integration with trading partners, enhancing diplomatic relations and supporting regional peace and stability. Hence, this paper builds on the premise that a more integrated economic relationship between Pakistan and India may not only provide the advantage of tapping into the large bilateral trade potential, but that it can also act as a means to achieving regional peace and prosperity.

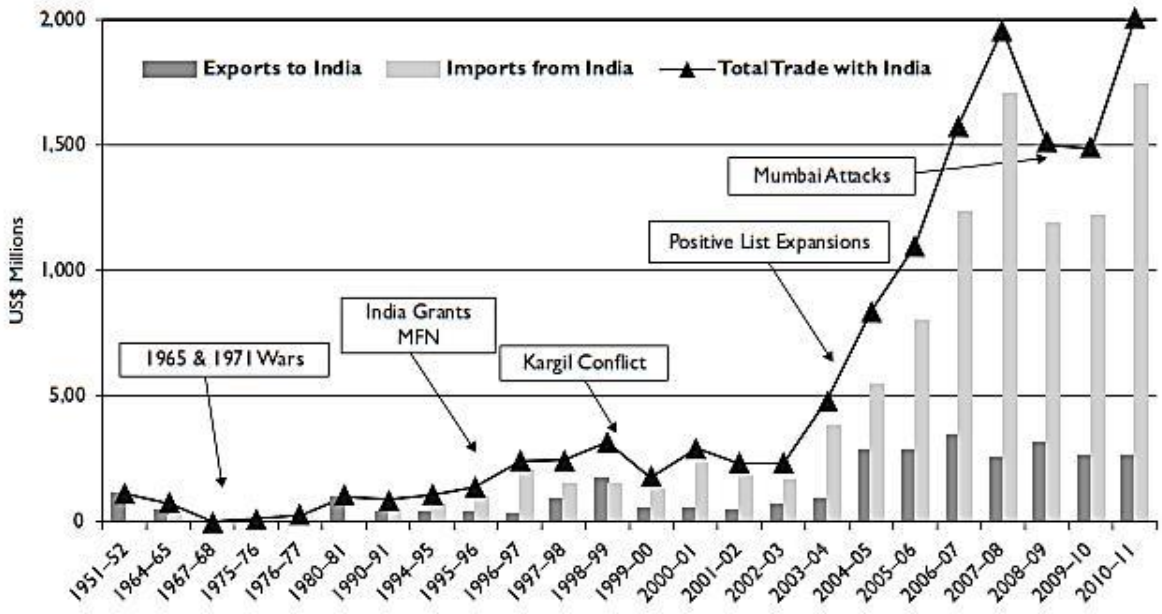
Dominated by two highly restricted trade regimes, South Asia remains one of the least integrated regions in the world (World Bank 2016). Compared to the South East Asian (SEA) countries, which boasts an over 9% share in total global exports, the South Asian region (mainly Pakistan and India) contributes a dismal 0.5% only (WTO 2015). Home to almost 25% of the world's population and the second largest number of people living in extreme poverty [3], South Asia remains a 'disconnected' region with intra-regional trade standing at a mere 5% - dwarfed in comparison to 25% in South East Asia (SEA), 35% within the East Asian economies and 60% in the European Union (EU) (World Bank 2016). The region's trade potential and shared economic benefits remain unrealized due to the trade restrictiveness and volatile political relations between Pakistan and India, the two largest South Asian economies comprising 90% of the region's GDP. The bilateral trade volume has remained appallingly low - peaking at approximately just US$ 2.7 billion in 2013.

[3] 400 million people living on less than US$ 1.90 a day (The World Bank, 2016).

Figure I below illustrates the pattern of Pakistan-India trade relations since their independence.

Figure I

The Pakistan-India Trade Relations (1951-52 until 2010-11)



Source: Gopalan et al (2013)

It is noteworthy that both countries remained as 'natural' trading partners immediately after partition due to high economic inter-dependence. However, annual trade volumes declined sharply from US$ 250 million in 1948-49, to less than half by 1951-52 and further, to less than a quarter by 1954-55 (Naqvi et al 2007). The striking collapse in trading relations reflected the increasing political hostility between the two countries. The already dwindling bilateral trade came to a complete standstill in the aftermath of the two full-scale military conflicts in 1965 and 1971. Even though following decades were marked by tensions over the Kashmir insurgency and territorial conflicts, India decided to unilaterally grant the Most-Favoured Nation (MFN) status to Pakistan under the auspices of the WTO in 1996. However, Pakistan decided not to reciprocate the gesture due to internal political and economic pressures and insisted on firstly resolving outstanding issues through a composite dialogue with India (Gopalan et al 2013).

Nevertheless, in an optimistic move, the government of Pakistan started expanding its positive list of imported items from India, from 577 items in 2004 to 1,928 in 2008. This relaxation witnessed a tremendous growth in bilateral trade volume reaching over US$ 2 billion in 2010-11 (Ibid). A major breakthrough in overcoming the turbulent economic relations between Pakistan and India came with the revival of trade talks in 2011. Pakistan decided in principle

to extend the MFN[4] status to India, by initially moving away from a positive list to a negative list approach in March 2012, thereby restricting only 1209 importable items from India, along with the rest of the world (Ministry of Commerce, 2012). Furthermore, the two countries also signed three trade agreements, related to mutual recognition of customs procedures, trade facilitation and visa liberalization (Raihan & De 2013). Although still much below potential, the warming of economic relations witnessed the highest bilateral trade volume of US$ 2.7 billion in 2013-14 from US$ 2.61 billion in the previous year, albeit followed by a slight slump to US$ 2.35 in 2014-15. It is argued that although unpredictable political and military tensions have created substantial hindrances, the extended delay in the reciprocation of MFN status to India by Pakistan since 1996 has also negatively contributed to building strong bilateral trade relations (Ahmed & Batool 2014).

Nevertheless, several studies have estimated large gains from bilateral trade by using the gravity model for trade – assuming that 'normal' trade relations were to hold between Pakistan and India over time. The gravity estimates range from the current level of US$ 2.5 to over US$ 50 billion (Khan 2011 & Raihan et al 2013). More specifically, De et al (2013) estimated that Pakistan's trade potential with India is at least 2.5 times the current actual trade, which can even increase up to 4.36 times (De et al 2013). They conclude that greater cooperation through bilateral trade could bring significant welfare gains to both countries.

Khan (2013) estimated the actual-to-potential trade (APT) ratios for Pakistan, India and the world, with respect to each other and selected trading partners, covering the period 1976-2005 and the post-Uruguay Round period, 1996-2005. He found that the lowest APT ratios of both countries actually correspond to their bilateral trade with each other. During the first period, the APT ratio for India's exports to Pakistan stood at a dismal 0.02, while that for Pakistan's exports to India stood at an even lower ratio of 0.01. Even with some improvements after the Uruguay Round in the second period, the APT ratios for Pakistan-India bilateral trade remained the lowest amongst all others and did not exceed 0.05. Hence when expressed inversely, the potential bilateral trade between the two countries was found to be at least 20 times more than the actual volume. However, in all of the above studies, gravity estimates were not based on maximum trade potential at the frontier.

By employing the Stochastic Frontier Gravity Model (SFGM), Miankhel (2015) finds that "behind the border" constraints were statistically significant in explaining Pakistan's total exports during 2009-11. Moreover, he highlights that these constraints affected the pattern of trade with India, resulting in unrealized trade potential with the country. Within the same framework, Khan and Kalirajan (2011) demonstrate that Pakistan's export growth between 1999 and 2004 is mainly attributed to a reduction in both "explicit and implicit beyond the border" trade costs in partner trading countries. An important finding was that total export losses with India due to the impact of "behind the border" constraints increased from US$ 618.66 million in 1999 to US $ 2120.29 million in 2004. Export losses with India between 1999 and 2004 also stood out with the second highest increase at US$ 1.5 billion.

[4] Also inter-changeably referred to as Non-Discriminatory Market Access (NDMA) by the Government of Pakistan. The conditions to trade remain the same as per MFN status under the WTO.

Following the above discussion, this paper proceeds as follows: Section 2 discusses the theoretical framework, methodology and data used for examining Pakistan's export potential with India. Section 3 deals with the empirical specification for the Stochastic Frontier Gravity Model (SFGM), including the obtained results for Maximum Likelihood Estimates (MLE), the impact of "behind the border" constraints measured by the significance of 'gamma' (denoted by 'γ'), the mean export efficiency and the analysis thereof. Section 4 provides conclusions of this paper. Pakistan's export figures for top 30 trading partners for 2013-15 are provided in the Appendix.

2. Theoretical Framework, Methodology and Data

2.1. Theoretical Framework

Although a number of methodological refinements and advancements have been made over time, an inherent limitation of the gravity model of trade remains its relative inability to explain the factors that influence trade flows. Kalirajan (1999) explains that trade flows between a country and its two trading partners may not necessarily be the same, even with similar levels of GDP and equal geographical distances with both of them. This is also referred to as the "economic distance" between trading partners. Such differences may arise due to restrictive or discriminating trade policies by the home country, the structure of the trading partners' economies and many other factors. These resistances to trade include "natural barriers", e.g. the geographical distance between trading partners, and "artificial barriers", e.g. high tariffs or non-tariff barriers (explicit such as product certification or implicit such as political differences) restricting imports with partner countries. Interchangeably, Drysdale and Garnaut (1982) classified the above barriers to trade into "objective" and "subjective" respectively. However, this paper will refer to these constraints as distinguished by Kalirajan (2007) into "natural", "behind the border", "explicit beyond the border" and "implicit beyond the border constraints". He explains that "behind the border" constraints are the country-specific and unique "socio-political-institutional" factors, which cause resistance in the smooth trade flows between a particular country and its trading partner.

In order to overcome the above limitation discussed and to measure the influence of trade-resisting factors that create the 'economic distance' between any two trading partners, Kalirajan formally introduced the "Stochastic Frontier Approach" to the gravity model of trade in 1999. The Stochastic Frontier Gravity Model (SFGM) estimates the 'potential trade' flows between trading partners through identifying factors that create economic distance, determining the relative importance of these factors and examining why the size of international trade flows differ between different pairs of countries. Hence, the error term in the gravity equation does not only include the statistical errors, but also captures the effect of 'omitted' variables.

Kalirajan (1999) defines potential trade as "the maximum possible trade that can occur, given the determinants, when there is no resistance to trade between the two countries. Moreover, this potential may vary over time given the constant changes to these impediments. Even though there may not be enough information available on these components, it is nevertheless,

possible to measure their combined effect (Kalirajan 2007). Roemer (1977) argues that these unobservable and often non-economic factors include variables such as the cultural, historical and political ties between countries, the influence of tying up of aid in their trading relationship and the communication mechanism between them. Furthermore, inefficient and weak institutions, unproductive and ad-hoc infrastructure development, undue political influence and lobbying and protectionist trade policies including non-tariff barriers, are also the identified as factors that constrain trade flows between countries (Elizondo and Krugman 1992, Levchenko 2004 & Gawande and Krishna 2001).

2.2. Methodology

A review of the literature shows that the Stochastic Frontier approach is a popular method of economic modelling in estimating potential production (output) levels (Aigner et al 1977 & Meeusen and Broeck 1977). For example, the production function is written as follows:

$$Y_i = f(x_i;\beta).TE_i$$

Where,

y_i = The actual output by producer (firm or country) i

x_i = The vector of N inputs used by producer i

β = The vector of technology parameters to be estimated

TE_i = The technical efficiency which is defined as the ratio of actual to potential output by producer I, which takes a value equal or less than 1. Here $TE_i = 1$ implies maximum feasible output, whereas $TE < 1$ implies a shortfall in the actual output as compared to its potential one.

However, within the context of international trade, Kalirajan (1999) explains that the Stochastic Frontier Gravity Model (SFGM) is estimated as following:

$$\ln X_{ij} = \ln f(Z_{ij};\beta) \exp(v_{ij} - \mu_{ij})$$

Where,

X_{ij} = Actual exports from country I to country j

Z_{ij} = Potential exports from country I to country j

B = A vector of unknown parameters

μ_{ij} = The single-sided error term that encompasses the combined effects of 'behind-the-border' constraints or bias created due to the economic distance between exporting country I and importing country j.

v_{ij} = The double-sided error term that captures the influence of any other omitted variables on trade flows between exporting country I and importing country j. It also includes measurement errors that are randomly distributed across observations in the sample.

In the above equation, μ creates the difference between the actual and potential bilateral trade between two particular trading partners. The error term takes any values between 0 and 1 and is assumed to follow a normal distribution, N (μ, σ_μ^2). As an example, when μ takes the value of 0, it can be inferred that the influence of behind-the-border constraints is not important and actual and potential exports remain equal, assuming that there are no statistical errors, i.e. $\ln X_{ij} = \ln f(Z_{ij}; \beta)$

When μ takes any value other than 0 but less than 1, it implies that the influence of economic distance bias or behind-the-border constraints is more significant in limiting actual exports from reaching the potential exports (Kalirajan 2007). Therefore, unlike the conventional method of estimating the standard gravity equation through the Ordinary Least Squares (OLS) approach, the stochastic frontier approach does not exclude the influence of the above-mentioned factors on trade flows between two countries. Maximum Likelihood methods can be applied to estimate the above discussed gravity model to determine how important are the "socio-political-institutional" factors in constraining trade flows.

In view of the analytical framework discussed above, this study proposes to employ the gravity model of trade within the stochastic frontier framework, in order to analyse the export potential and export efficiency of Pakistan in order to examine the potential of a bilateral FTA with India.

2.2.1. Advantages

As discussed in Kalirajan (2007), the reason this study chooses to employ the SFGM approach is due to its three main advantages. Firstly, the influence of the economic distance error term would be isolated from that of the usual statistical error term. This property would help determine the influence of behind-the-border constraints have limiting the export potential - in this case of Pakistan. Thirdly, the approach provides potential export estimates - defined as the maximum level of exports given the current level of determinants of exports and the given least level of restrictions within the system. Finally, since the approach allows for strong theoretical and trade policy implications - it provides the framework for determining and analysing effective recommendations for improving the Pakistan's export performance, keeping in view the country-specific "behind the border" constraints

2.3. Data

Data on exports of Pakistan with top 30 trading partners is taken from the UN COMTRADE database. The ranking of trading partners is in terms of total volume of exports. GDP data for Pakistan and importing countries and simple MFN tariff rates are taken from the World Development Indicators (WDI) database provided by the World Bank. Exchange rates for local

currencies of importing countries in terms of US$ are obtained from the International Financial Statistics (IFS) database by the International Monetary Fund (IMF). The geographical distance between capital cities have been taken from www.worldatlas.com. Finally, information regarding Pakistan's existing FTAs has been taken from the information published on the website of Ministry of Commerce, Pakistan.

3. Analysis of Empirical Results

3.1 Empirical Specification of the Stochastic Frontier Gravity Model (SFGM)

The following empirical specification for the SFGM is used for estimating Pakistan's export potential to its top thirty importing partners, including India, from data covering the period 2013-15,

$$lnEx_{Pak,j\,(t)} = \beta_0 + \beta_1 lnGDP_{j(t)} + \beta_2 lnGDP_{Pak(t)} + \beta_3 Tariff_{j(t)} + \beta_4 lnExRate_{USD,j\,(t)} + \beta_5 lnDist_{Pak,j(t)} + \beta_6 FTA_{Pak,j\,(t)} + (V_{Pak,j\,(t)} - \mu_{Pak,j\,(t)})$$

In the above equation, $lnEx_{Pak,j\,(t)}$ is the level of exports from Pakistan to country j, where j is one of the top 30 importing countries at time t, and reflects exports of all goods. $lnGDP_{j\,(t)}$ is gross domestic product at market prices of the importing country, while $lnGDP_{Pak\,(t)}$ is gross domestic product at market prices of Pakistan at time t. The value of the above variables is in USD billions. $Tariff_{j\,(t)}$ is the simple annual Most-Favoured Nation (MFN) tariff imposed by importing country j on exporting countries in the world and is expressed in percentage terms. $lnExRate_{USD,j\,(t)}$ is the annual average exchange rate between Pakistan and importing country j in terms of 1 USD against the local currency of that country. $lnDist_{Pak,j}$ is the geographical distance between Islamabad, the capital city of Pakistan and the capital city of the importing country j, measured in kilometres. Lastly, $FTA_{Pak,j}$ is a binary dummy variable, which takes the value of 1 if a Free Trade Agreement (FTA) exists between Pakistan and its importing partner or 0 when no such agreement exists. $(V_{Pak,j\,(t)} - \mu_{Pak,j\,(t)})$ is the error component term in the model, where $V_{Pak,j}$ is the random disturbance term and $\mu_{Pak,j\,(t)}$ is the one-sided disturbance term encompassing the combined effects of the country-specific 'socio-political-institutional factors that prevent Pakistan's exports from reaching their potential. The error terms are assumed to be independent of each other. The term 't' in the above equation represents the time period from 2013 till 2015.

3.2. The Maximum Likelihood Estimates (MLE)

The above model has been estimated using the Frontier (version 4.1) program (Coelli 1996) and the results for the Maximum Likelihood Estimates are presented in the tables below:

Table I

(a) FTA with India = 0

No.	Variables	β	Coefficient	t-ratio
1	Constant	β_0	31.934	4.523***
2	lnGDP (j)	β_1	0.055	2.807**
3	lnGDP (Pak)	β_2	-0.676	-2.515**
4	Tariff	β_3	-0.053	-1.512*
5	lnExRate	β_4	-0.130	-2.830**
6	lnDistance	β_5	-0.134	-1.152
7	FTA	β_6	0.767	5.175***

(b) FTA with India = 0

No.	Variables	β	Coefficient	t-ratio
1	Constant	β_0	31.933	4.532***
2	lnGDP (j)	β_1	0.054	2.666**
3	lnGDP (Pak)	β_2	-0.678	-2.514**
4	Tariff	β_3	-0.053	-1.446*
5	lnExRate	β_4	-0.126	-2.018**
6	lnDistance	β_5	-0.124	-0.991
7	FTA	β_6	0.753	4.742***

Notes: ****refers to significance at the 1 percent level.*
***refers to significance at the 5 percent level*
**refers to significance at the 10 percent level*

Table 1(a) shows the actual situation for Pakistan's export potential with its top 30 importing countries over the period 2013-15. It is noteworthy that on average these 30 countries represented about 85% of Pakistan's total exports to the world and therefore provide a sound basis for analysing Pakistan's export potential during from 2013 until 2015. India remained as Pakistan's 14th largest exporting market during this time (See Appendix for export data).

Table 1(a) also represents that currently no FTA exists between Pakistan and India, therefore the binary dummy variable of FTA for India equals zero. However, the adjacent Table 1(b) assumes that such an FTA *does* exist and hence, the FTA dummy variable for India carries a value of one in this case. As illustrated in both tables, the coefficient estimates for constant and FTA are significant at the 1% level. Those for Pakistan's GDP, importing country j's GDP and exchange rate are significant at 5% level, while that for tariff is significant at 10% level.

The key observation from comparing the results in both tables is that there are no significant changes in variable coefficients and in their corresponding significance levels. Hence , the implication is that there are no significant changes in Pakistan's mean export efficiency or export potential to India, whether the country had an FTA with the latter or not. This is an expected finding as the ratio of Pakistan's actual exports to India stood at a mere 1.5% to its total exports on average during this period[5]. Hence, it may be safe to infer that such a low percentage would not have a significant effect on the country's export potential. Moreover, a lack of significant variation in results also confirms that robustness of the estimated SFGM model

As discussed earlier, it is important to note here that parallel to the *formal* trade between Pakistan and India through direct routes, *informal* trade has been taking place between the two

[5] Based on author's calculations from UN COMTRADE export data (2013-15)

countries via third country routes in the last two decades, primarily through Dubai (UAE) and Afghanistan. Several earlier studies estimated the value of this informal trade in the range of US$ 250 million to US$ 2 billion (SBP 2006, Taneja 2007, Khan et al 2007, & Ahmad et al 2014).

However, the most recent survey-based estimates for 2012-13 by the Indian Council for Research on International Economic Relations (ICRIER) (2016), show that the total informal trade US$ 4.71 billion, which is at least more than double the formal trade between Pakistan and India. The ICRIER (2016) explains that the main channel for this "quasi-legal" trade is the "India-Dubai-Pakistan" route. Although this trade volume is recorded as that between India and UAE and Pakistan and UAE, it is estimated that US$ 3.9 billion of it ended up being India's exports to Pakistan and US$ 0.72 billion as Pakistan's exports to India (ICRIER 2016). The trade balance tilted in favour of India is also consistent with that of formal trade between the two countries. Hence, within this context, the estimated results also indicate that such an established third-country route appears to be a strong link between the two countries. The explanatory power of the estimated model appears to be strong, as the results appear to be consistent with the on-ground trade scenario between Pakistan and India.[6]

Moving on from the above explanation for comparative results in Tables 1 (a) & (b), this paper will analyse the potential of an FTA between Pakistan and India based on more detailed results of Table 1 (b) presented in Table II below.

[6] Filipini and Molini (2003) explain that while the gravity model is often criticised as "facts without theory", the consistency of its results in explaining facts has made it very popular for empirical applications

Table II

Maximum Likelihood Estimates of the Stochastic Frontier Gravity Model for Pakistan's Exports to Top 30 Importing Countries, including India (2013-15)

Variable	Coefficient Estimates
Constant	31.9341***
	(7.0596)
lnGDP (j)	0.0553**
	(0.0197)
lnGDP (Pak)	- 0.6761**
	(0.2687)
Tariff	- 0.0532*
	(0.0352)
lnExRate	- 0.1300**
	(0.1167)
lnDistance	- 0.1345
	(0.1167)
FTA	0.7671***
	(0.1482)
Sigma-squared (σ^2)	1.7874
	(1.4180)
gamma (Υ)	0.9858***
	(0.0114)
mu (μ)	0.35149
	(1.1720)
Log Likelihood function =	-26.3501

Notes: ****refers to significance at the 1 percent level.*
***refers to significance at the 5 percent level*
**refers to significance at the 10 percent level*

Table II presents the Maximum Likelihood Estimates (MLE) of Pakistan's exports to its top thirty partner countries, including India. In terms of their signs, the coefficients of the variables appear to be consistent with theoretical predictions in international trade. Furthermore, the coefficients of all the above variables, except 'Distance', are significant at least at the 10% level.

As shown, the sign of importing country's GDP is positive and is significant at 5% level. This means that higher the GDP of importing country, higher are Pakistan's exports to that country in order to cater to its large domestic demand. This behaviour is apparent in the trend of Pakistan's exports to the world in the period 2013-15. Out of thirty countries analysed for this

model, more than two-third fall within the medium-to-high income bracket, with 70% of Pakistan's exports directed towards countries including the United States, the European Union (EU), the UAE, Korea, Hong Kong and Canada.[7]

The negative sign of Pakistan GDP, significant at the 5% level, implies that as Pakistan's GDP increases over time, the country's exports decrease in response, due to higher domestic demand for these goods. This implies that the country should increase its productivity to sustain a certain level of export volume in the face of rising domestic demand.

The variables tariff and exchange rate, significant at the 10% and 5% levels respectively, enter the estimated equation with negatives signs. According to economic intuition, higher the tariffs in the importing country, the lower will be Pakistan's exports to such countries. One of the reasons for a relatively lower significance of tariffs on Pakistan's exports could be that as a developing country, it enjoys duty-free access for a range of products imported by the United States and the European Union countries, under the Generalized System of Preferences (GSP) program (The Express Tribune 2016). The two constituted as the biggest export destinations for Pakistan in the period under analysis (World Bank 2015). It may be noted that as international trade is conducted in US dollars and since the exchange rate taken here is in terms of US$ against the importing country's local currency, the negative sign of the variable implies that an appreciation of the US$ would discourage imports from Pakistan.

Moving on, Kalirajan (2007) explains that an increase in the geographical distance between two trading partners would generally result in higher transaction costs which would then add to the bilateral trade cost. This in turn would discourage trade between the two countries. However, as shown in Table II, the distance variable does not appear to have a significant impact on Pakistan's exports. This is apparent from the fact that more than half of the country's exports in 2013-15 were directed towards the United States (US) and the European Union (EU)[8], which are situated thousands of kilometres away. Compared to this, exports to neighbouring countries such as China, Afghanistan and India stood at just around 20% during the same period.[9] Moreover, considering the case of informal trade between Pakistan and India, via the Delhi-Mumbai-Dubai-Karachi-Lahore route, the transaction and transport costs are estimated to be four times higher than that of trading directly between Lahore and Delhi (ICRIER 2016). Interestingly, even though this journey is at least eleven times longer than the direct route, it is estimated to be at least 3 times more efficient (Ibid). In order to record this trade in national accounts and to significantly reduce trade costs, an important policy implication for encouraging direct routes would be to substantially improve efficiency of trading across the border.

Finally, the variable FTA appears to be highly significant at 1% level for Pakistan's exports. Hence, Pakistan's exports tend to increase significantly, if it has preferential market access or an FTA with its importing partners. Out of the top 30 importing countries, Pakistan has operational FTAs with China and Sri Lanka, a transit trade agreement with Afghanistan and

[7] Based on author's calculations from UN COMTRADE export data (2013-15)
[8] Based on author's calculations from UN COMTRADE export data (2013-15)
[9] Based on author's calculations from UN COMTRADE export data (2013-15)

preferential tariff arrangements with US and the EU (ARIC Database 2016). Analysing the export trend from 2013-15, China emerges as the second largest export destination for Pakistan, if the EU is not considered a single market. However, Memon et al (2014) reveal two interesting findings in this regard. Firstly, they find that restricted trade has diverted Pakistan's large export potential with India towards China. They conclude that Pakistan is exporting more to China even though the potential for export growth is higher with India. Secondly, by comparing the revealed comparative advantage (RCA) indices for imports from China and India, they argue that restricted trade with India has resulted in more imports from China through excessive concessions, thereby resulting in inefficient trade with a less competitive partner. They further note that even though India and China both share a border with Pakistan, the transportation costs are actually higher for conducting trade with China than India.

3.3. The Significance of Gamma – Measure of "Behind the Border" Constraints

An important result in Table II is the magnitude and significance of 'gamma' (denoted by 'γ'), which is defined as the ratio of variation in exports due to "behind the border" constraints to the total variation in exports. As can be observed from the results shown, gamma is highly significant at the 1% level and carries the value of 0.9858, which is very close to 1, the upper limit for a gamma coefficient. Such a large value of gamma in this case implies that 98.58% of the difference between Pakistan's export potential and actual exports with its partner countries, including India, is due to the influence of country-specific "behind the border" constraints.

The above interpretation appears to be correct to a large extent. Not only does Pakistan need to overcome its supply side constraints, especially in the face of a growing energy deficit, but it also needs to adapt to non-tariff barriers such as product standardization and certification, especially in the case of increasing its export potential to India (Vaqar and Batool 2014). Moreover, lack of trade facilitation in terms of transportation linkages, storage and warehouse facilities, information flows, visa restrictions and non-harmonization of tariff codes are notable identified constraints in resisting a smooth trade flow with India (De et al 2013).

Furthermore, the delay in the process of granting MFN status to India also has a strong basis in government policies and their implementation, where the main challenge is to circumvent strong opposition from the local industries. In this case, Pakistan can look towards its neighbouring country Sri Lanka for pushing forward a domestic agenda when the latter signed the Indo-Lanka Free Trade Agreement (ILFTA) with India in 1998. The Sri Lankan government also dealt with strong opposition that cheaper imports from India would wipe out local industries. Despite these concerns and considering the larger interest of consumers, the Sri Lankan government signed the FTA with India – an exemplary move that has since been hailed as a remarkable achievement in India and Sri Lanka's trade relations (Weerakoon and Thennakoon 2007).

Similarly, the unpredictable security situation with India has also been a strong social-political-institutional constraint in achieving Pakistan's export potential with India. In this context, a review of the literature supports that (military) conflicts between countries significantly reduces international trade (Davis and Weinstein 2002, Blomberg et al 2004, and Barro 2006).

In a breakthrough attempt, Lee and Pyun (2009) empirically analysed a panel data set of 290,040 country-pair observations from 1950 to 2000 and concluded that bilateral trade interdependence significantly promotes peace between countries. Moreover, the peace-promotion effect of bilateral trade integration is significantly higher for contiguous countries - which are more likely to engage in conflicts. Similarly, Mamoon and Murshed (2009) have more specifically investigated the conflict-mitigating effects of trade between Pakistan and India. While recognising that conflict between two nations is best analysed in a multivariate framework, their results indicate that a lack of economic integration through trade has been a conflict-enhancing factor in the case of Pakistan and India.

3.4. Export Efficiency Analysis

Figure II illustrates that the country's mean export efficiency increased from 31% in 2013 to 50% in 2014, but reduced to 44% in 2015. Table III presents Pakistan's export efficiency with respect to each of the thirty partner countries, including India. The mean efficiency for Pakistan's exports (2013-15) is very low at 41.5%. However, this appears to be reasonable considering the above discussed "behind the border" constraints. Expressed inversely, this implies that Pakistan's actual exports are under-performing from their potential by almost 60%.

Figure II

Pakistan's Annual Export Efficiency (2013-15)

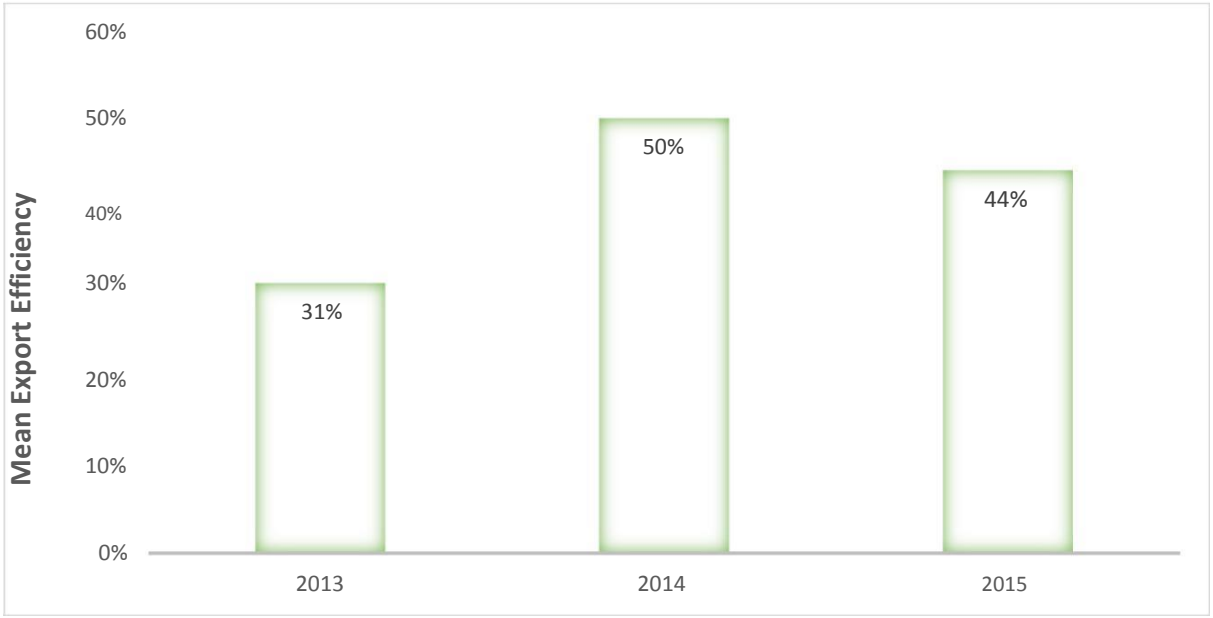


Table III

Export Efficiency of Pakistan for Top 30 Partner Countries, including India (2013-15)

No.	Importing Country	Export Efficiency (%age)
1	United States of America	89
2	China	87
3	Afghanistan	82
4	United Kingdom	89
5	Germany	68
6	United Arab Emirates	91
7	Spain	46
8	Bangladesh	55
9	Netherlands	43
10	Italy	41
11	Belgium	40
12	Saudi Arabia	35
13	France	24
14	***India***	***45***
15	Korea, Republic of	81
16	Kenya	61
17	Viet Nam	79
18	Sri Lanka	21
19	Hong Kong, China	9
20	Turkey	14
21	South Africa	30
22	Canada	14
23	Singapore	4
24	Malaysia	8
25	Japan	19
26	Australia	12
27	Oman	11
28	Russian Federation	22
29	Portugal	11
30	Poland	12
	Mean Efficiency	**41.5**

Ravishankar et al (2014) explain that the efficiency scores generated from frontier specification of the gravity model imply the maximum trade potential between two trading partners. If two countries are trading efficiently it means that they are trading at the frontier or at the maximum trade potential. They point out that deviations from the trade frontier represent inefficient levels of trade and imply scope for trade expansion or trade potential between the trading partners.

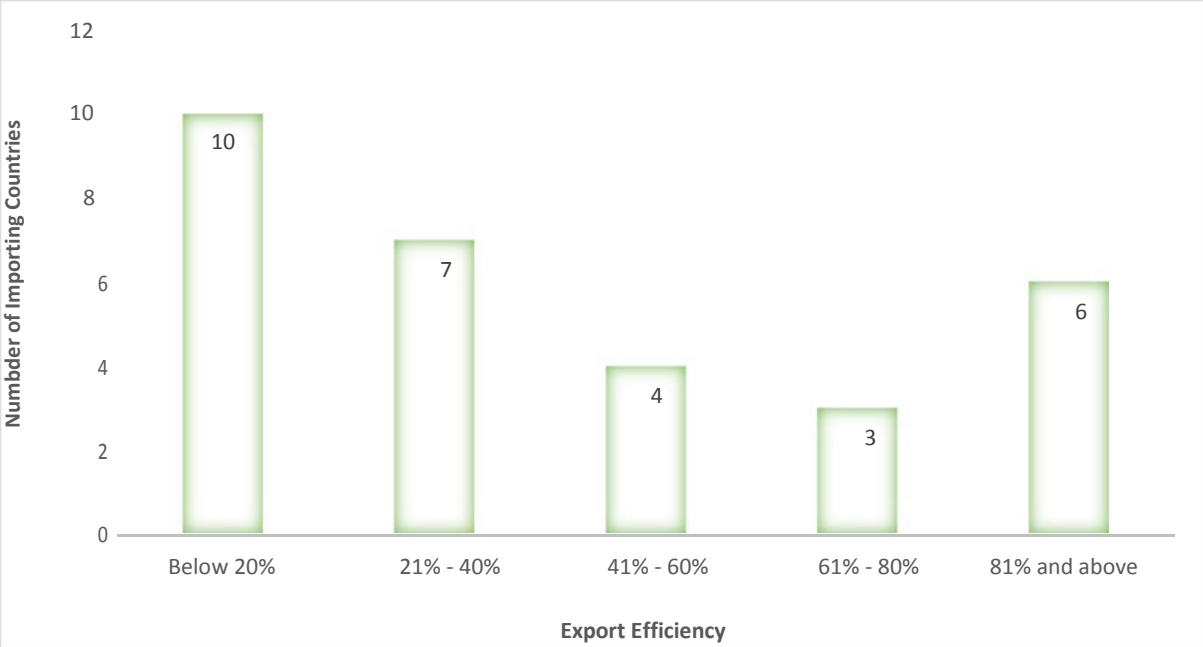
Interestingly, the results in Table III indicate that Pakistan has high potential with 23 out of 30 countries in the data set. Amongst its neighbouring countries, India stands out as the most

favourable trading partner of Pakistan, with the highest unrealized export potential of 55% (or lowest export efficiency at just 45%) in the region. This is a significant finding and is consistent with the rest of the estimations in this paper and in the existing literature discussed earlier. Moreover, amongst the South Asian regional partners included in the data set, Pakistan has the lowest export ratio with India in the region at an average of 12%[10], even though the export potential with India is higher than 18% with Afghanistan and 45% with Bangladesh.

Further decomposition of the export efficiency (2013-15) reveals a worrying trend for Pakistan's export potential. Figure III reflects that Pakistan has a high export efficiency (or low export potential) of 81% and above with six trading partners. On the other hand, Pakistan has a very large export potential with 10 countries with whom the export efficiency stands at below 20% - Singapore, Malaysia and Hong Kong being noticeably high potential countries in this case.

Figure III

Classification of Pakistan's Mean Export Efficiency (2013-15)



The first finding indicates that Pakistan has almost exhausted its export potential with countries such as the United States, United Kingdom in the EU, China, Afghanistan and United Arab Emirates (UAE). Incidentally, these five countries also feature amongst Pakistan's six largest trading partners. The policy implication of this finding is that either Pakistan needs to diversify its targeted export markets or it needs to substantially increase its competitiveness in producing diversified products to the existing markets in order to increase its potential. It is noteworthy,

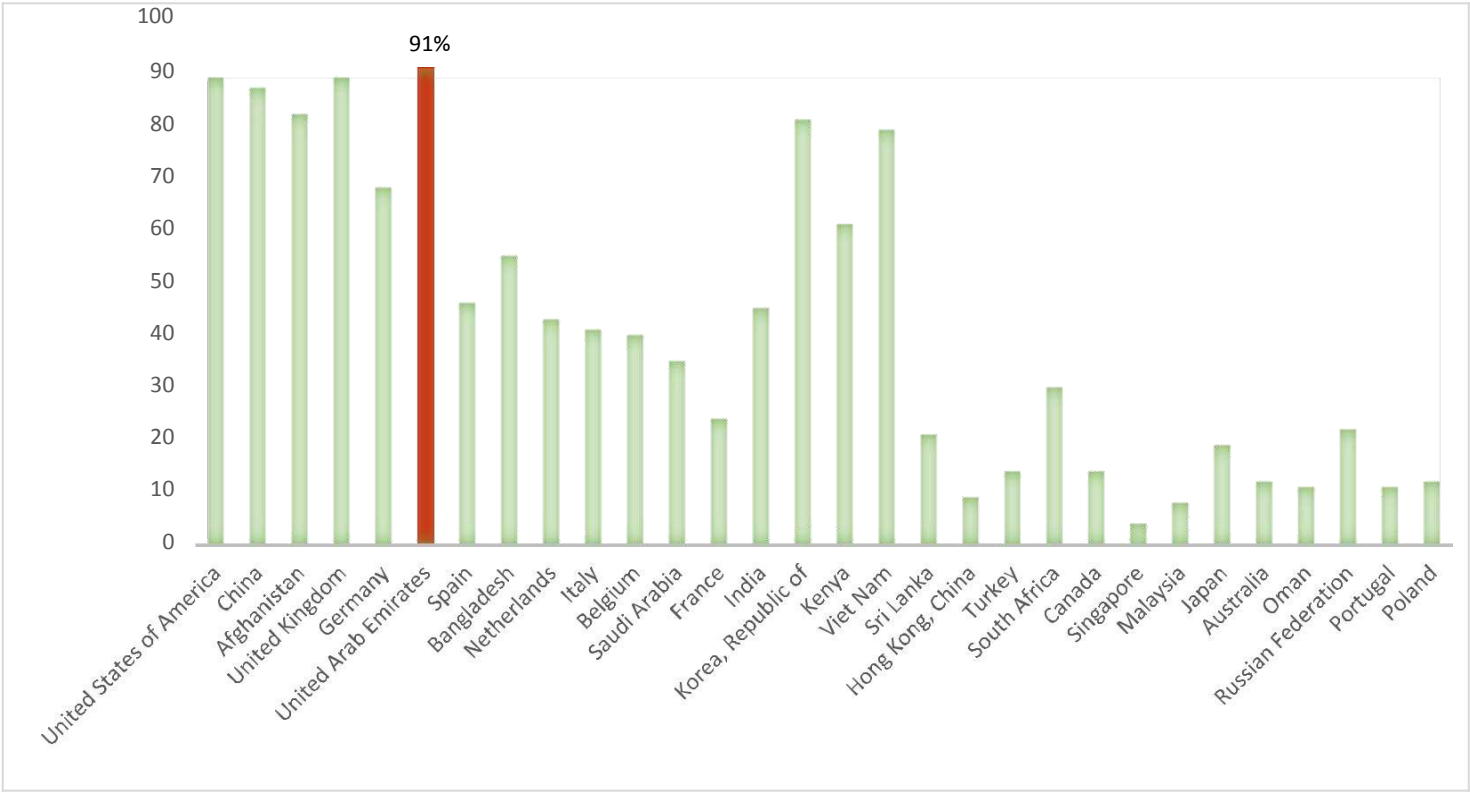
[10] Based on author's calculations from UN COMTRADE export data (2013-15)

that these results appear to be consistent with the gravity estimations reported by Abbas and Waheed (2015) for the periods 1991-00 and 2001-11. They also identified a similar trend, which reflected that Pakistan had largely exhausted its export potential with the above countries[11] in the above periods as well.

With respect to individual trading partners, a deeper analysis of export efficiency estimates illustrated in figure III reveals some interesting patterns. Recalling that most of the informal trade between Pakistan and India takes place via Dubai (United Arab Emirates), it is particularly interesting to observe that Pakistan's highest export efficiency (or lowest export potential) of 91% is with the United Arab Emirates, which is the sixth largest importing country in this data set. Khan et al (2007) estimated that 88% of informal trade between Pakistan and India tales place via the Lahore-Karachi-Dubai-Mumbai -Delhi route. The significance of this route and that Pakistan's total estimated informal exports to India in 2013-14 stood at US$ 0.72 billion (ICRIER 2016), appear to indicate that Pakistan's high export efficiency (or low export potential) for UAE appears to have a link with Pakistan's high export potential (or low export efficiency) for India as estimated earlier.

Figure III

Pakistan's Export Efficiency with Top 30 Trading Partners (2013-15)



[11] Excluding Afghanistan, as the country did not feature as a trading partner in the study's data set

Substantiating the above finding, studies have shown that occurrence of informal and indirect trade between Pakistan and India reflects the avoidance of tariff and non-tariff barriers and subsequently indicates the potential for expanding formal trade (De et al 2013, ICRIER 2016, Khan 2016). While estimating the potential for formal trade at US$ 21.2, the ICRIER Report (2016) concludes that the circuitous route of informal trade via Dubai (UAE) is in itself indicative of the considerable trade potential between Pakistan and India.

4. Conclusion

In order to examine the potential of an FTA between Pakistan and India, empirical estimations were carried out to measure the influence of "behind the border" constraints in resisting bilateral trade and to subsequently analyse the efficiency of Pakistan's exports during 2013-15. In this context, a variation of the gravity model within the Stochastic Frontier framework was used to identify the maximum potential of Pakistan's exports to its top 30 trading partners, including India, during the above period. The significance of examining a more integrated trade agreement between Pakistan and India rested on two main perspectives. Firstly, a bilateral FTA would be advantageous in reducing the "trade gap", the difference in potential and actual trade between Pakistan and India, by addressing the country-specific constraints for Pakistan. Secondly, it would not only provide a vent for realizing the large trade potential between the countries, but would also act as a means of achieving the ultimate objective of ensuring peace and prosperity in South Asia.

The results show that "behind the border' constraints had a highly significant influence on Pakistan's exports to major trading partners during 2013-15. Moreover, the existence of FTAs with trading partners proved to be substantial to Pakistan's exports. However, the above socio-political-institutional factors greatly reduced Pakistan's export efficiency to India to just 45% - close to its overall mean export efficiency of 41.5%. However, expressed inversely, the results confirm a large export potential does exist towards India, with a deviation of 55% from the export frontier. The results further revealed a likely pattern of informal trade through the United Arab Emirates, in order to cater to the high export potential with India. This finding was consistent with the review of literature. Hence, it can be concluded that the potential of a bilateral FTA between Pakistan and India appears to be high, however the effectiveness of this arrangement requires minimising the existing significant levels of 'behind the border' constraints.

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Appendix

Pakistan' Exports to top 30 Trading Partners (2013-15)

(Figures in US$ in Billions)

Country No.	Country	2013	2014	2015
1	United States of America	3.75	3.65	3.66
2	China	2.65	2.25	1.93
3	Afghanistan	2.00	1.88	1.72
4	United Kingdom	1.43	1.65	1.57
5	Germany	1.08	1.22	1.15
6	United Arab Emirates	1.78	1.32	0.90
7	Spain	0.60	0.79	0.78
8	Bangladesh	0.72	0.69	0.70
9	Netherlands	0.63	0.68	0.67
10	Italy	0.64	0.77	0.62
11	Belgium	0.57	0.66	0.59
12	Saudi Arabia	0.49	0.51	0.43
13	France	0.41	0.43	0.36
14	India	0.40	0.39	0.31
15	Korea, Republic of	0.40	0.38	0.29
16	Kenya	0.26	0.33	0.28
17	Viet Nam	0.26	0.26	0.28
18	Sri Lanka	0.32	0.27	0.26
19	Hong Kong, China	0.41	0.33	0.24
20	Turkey	0.41	0.39	0.24
21	South Africa	0.29	0.29	0.22
22	Canada	0.23	0.22	0.22
23	Singapore	0.09	0.25	0.21
24	Malaysia	0.20	0.23	0.19
25	Japan	0.18	0.19	0.18
26	Australia	0.26	0.17	0.18
27	Oman	0.19	0.19	0.17

28	Russian Federation	0.21	0.19	0.16
29	Portugal	0.16	0.17	0.15
30	Poland	0.10	0.15	0.14
Total Export to 30 countries		**21.11**	**20.89**	**18.8**
Total Exports to the World		**25.12**	**24.72**	**22.08**