Import nexus of Pakistan

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Key Words
Gravity Model, Import flows, Distance, H-O-H Hypothesis

Abstract

Trade is fundamental part of all economic and development efforts, national economic growth, industrialization and technological knowledge. This Paper is organized to estimate the Import determinants of Pakistan and to set up the major contributing factors for it by applying the augmented gravity model of trade. We inferred that most important variable that significantly impact the import flows to Pakistan are foreign GDP which is used as substitute for economic size of a country and absorption capacity. Distance between Islamabad and its trading partners is also considered very crucial as it defines the trade hindrance and transportation cost. Absolute difference in per capita income between Pakistan and its trading countries is yet another variable impacting Import flows which indicates the development level, taste structure and factor abundance of a country.

Introduction

Until recently, Trade is playing a pivotal role in the total development effort and national economic growth of the economy. It is a vital instrument for industrialization and a fundamental source for the dissemination of the technological knowledge, ideas, skills, managerial talents and entrepreneurship. International trade get good reward due to many benefits it has presented to different economies across the world .It accounts for increasing gross domestic products ,investment and one of vital source of revenue.

Pakistan's trade has observed rapid expansion during initial years of 2000s, as it increased from US$ 18.8 billion (25.5 percent of GDP) in FY00 to US$ 47.5 billion (33.1 percent of GDP) in FY07 due to better trade & tariff reforms. The rise in the overall trade seems to be more prominent in imports rather than export. Exports lean towards traditional markets and concentrated in traditional products. As a result, Pak's share in the world exports not only remained low (0.14 percent) in FY06 but also turn down over the period. This compares unfavorably with India (1.02 percent), China (8.22 percent) and overall Asian regional counterparts (27.8 percent). Pakistan is declared as a consumption society, satisfying its requirements from outer world. Import is escalating continuously which happens to be the motivation of this analysis.

In order to organize the study to find the major contributing factors of Import, We apply the gravity model for our analysis, because gravity models have been used in empirical studies of changes in international trade pattern and integration of economies since Tinbergen (1962). It provide useful multivariate framework to analyze the patterns of international trade. We estimate the import flows of Pakistan from its 150 trade partner by applying gravity model using cross-section-OLS estimation technique over the time span of 1970-2009, making segments of five year averages. This has been done first time in literature that cross-section OLS estimation is applied for series of years taking their averages. Previous studies either consider Cross-Section OLS estimation only for a specific year or they rely on panel data estimation. Nonetheless, both have their own shortfalls.

Numerous studies originating from Tinbergen (1962) and Linneman (1966), showed that trade flows follow the physical principles of gravity: two opposite forces find out the volume of bilateral trade between countries. Gravity equation has been used widely in the empirical literature on international trade. There are various categories of empirical application of gravity equation, that are estimating the cost of a border (Anderson and van Wincoop (2003), explaining trade patterns (Bergstrand (1989), Hummels and Levinsohn(1993), identifying effects related to regionalism and calculating the trade

potentials (Wang and Winters (1991),Baldwin(1993), Gros and Gorciarz(1995).

Anderson (1979) makes the first formal attempt by assuming a model of product differentiation for the derivation of Gravity model. Bergstrand (1985, 1989) in a series of papers links gravity equation with simple monopolistic competition models. A differentiated product framework with increasing returns to scales is used by Helpman (1987) to give good reason for the gravity equation. Deardorf (1995) has shown that gravity model is derivable from standard trade theories. CES expenditure system is maneuvered in the derivation of gravity model by Anderson and Wincoop (2003). Eaton and Kortum (1997) derive gravity equation from Ricardian framework, while Deardorff (1997) derives it from H-O viewpoint. It is shown by Eventt and Keller (1998) that gravity equation can be obtained from the H-O model with both perfect and imperfect product specialization. While Transaction costs into the gravity model was introduced by Gould (1994). A measure of linguistic similarity based on the proportion of a population that speaks a particular language as a first language is constructed by Boisso and Ferantino (1997).

The volume and direction of trade for Iran in a 76 country sample is analyzed by Kalbasi (2001).The groups of countries are divided into developing and industrial countries and trade flows are examined to determine the impact of the stage of development on bilateral trade flows of Iran. Rehman (2003) estimates trade potential for Bangladesh using panel data approach with economic factors like openness, exchange rates etc rather than natural factors and Sohn (2005) applied the gravity model to explain South Korea's trade flows and to extract practical trade policy applications. Christos (2006) applies gravity equation to bilateral trade flows among EU member's states and their main trading partners. There are different categories of empirical applications of the gravity equation which can be mentioned to investigating issues in international trade.

The main contributions of this paper is: it reaffirms a theoretical justification for using the gravity model in applied research ; it applies, for the first time, cross section-OLS estimation for a series of 5-Year Averages in a gravity model framework to identify the import flows of Pakistan.

Methodology

Modeling and predicting foreign trade flows has long been an important task in international economics. One of the most fruitful ways to formalize this has been through the use of gravity models. The gravity model has been tested both for the aggregate bilateral trade and also for product level trade. Aggregate model has been estimated using different data set by [Wang and Winters (1991), Hamilton and Winter (1992), Baldwin (1994), Breuss and Egger (1999)] etc. The correct econometric representation of gravity model takes the form of a triple-indexed model. Matyas (1997) argues that the proper specification of gravity model takes the following representation:

$$T_{ijt} = \alpha_i + \gamma_j + \lambda_t + \beta^{'} x_{ijt} + \delta^{'} z_{ij} + u_{ijt}$$

(1) Where α_i, γ_j and λ_t are well- known specific effects attributed to the panel data modeling approach. If only cross section data are used, $\lambda_t = 0$ and when only time series data are used then $\alpha_i, \gamma_j = 0$. Finally when panel data are used, there are no restrictions. From an econometric point of view, $\alpha_i, \gamma_j = 0$ and λ_t specific effects can be treated as random variables. Matyas is not specific about fixed and random effect model estimation in case of above mentioned model. It is observed that gravity model works well at product or sectoral levels. Model (1) should be viewed as the generic form of all gravity models and is a direct generalization. When cross-section data are used then T=1 and implicitly restriction $\lambda_t = 0$ is imposed on the model [(e.g.; Aitken (1973), Bergstrand (1985), Brad (1994), Oguledo and Macphee (1994), and Frankel *et al*, (1995)].We used cross-section OLS for our analysis to estimate gravity models. Classical gravity models generally use cross-section data to estimate trade effects and trade relationships for a particular time period. Whichever specification of the augmented gravity model is used, the main purpose of this specification is to allow for non-homothetic preferences in the importing country and to proxy for the capital/labor ratio in the

exporting country (Bergstrand, 1989).

The generalized gravity model of trade states that the volume of trade / exports / imports between pairs of countries, T_{ij} is a function of their incomes (GNPs or GDPs), their populations, their distance (proxy of transportation costs) and a set of dummy variables either facilitating or restricting trade between pairs of countries. That is,

$$T_{ij} = \beta_\circ Y_i^{\beta_1} Y_j^{\beta_2} N_i^{\beta_3} N_j^{\beta_4} D_{ij}^{\beta 5} e^{\beta_m A_{IJ}} U_{ij} \qquad (2)$$

Where $Y_i(Y_j)$ indicates the GDP or GNP of the country 'i' and 'j', $N_i(N_j)$ are populations of the country 'i'and 'j', D_{ij} measures the distance between the two countries' capitals (or economic centers.) A_{ij} represents dummy variables, U_{ij} is the error term and β's are parameters of the model. 'i' is used for home country and 'j' for target country.

Using per capita income instead of population, an alternative formulation of equation (2) can be written as

$$T_{ij} = \beta_\circ Y_i^{\beta_1} Y_j^{\beta_2} y_i^{\beta_3} y_j^{\beta_4} D_{ij}^{\beta_5} e^{\beta_m A_{ij}} U_{ij} \qquad (3)$$

Where $y_i(y_j)$ are per capita incomes of country 'i' and 'j'. As the gravity model is originally formulated in multiplicative form, we can linearize the model by taking the natural logarithm of all variables. The log form of general gravity model is as follow.

$$\ln T_{ij} = \beta^* + \beta_1 \ln Y_i + \beta_2 \ln Y_j + \beta_3 \ln y_i + \beta_4 \ln y_j + \beta_5 \ln D_{ij} + \sum_{m=1}^{M} \beta_m A_{ij} + u_{ij} \qquad (4)$$

Where

$$\beta^* = \ln \beta_0$$

Where "ln" denotes natural logs. A_{ij} is the sum of (trade) dummy variables. Dummy variables take the value of one when a certain condition is satisfied and zero otherwise.
Using our data set, we estimate the gravity models for Pakistan's Import. For our models we have followed Frankel (1993), Hassan (2000) and Rehman (2003).
The gravity model for Imports in our study is:

$$\ln M = \beta_1 + \beta_2 \ln Y_f + \beta_3 \ln(P_f) + \beta_4 \ln(Ay) + \beta_5 \ln(TOF) + \beta_6 \ln(FCR) +$$

$$\beta_7 \ln(RER) + \beta_8 \ln(Dis) + \beta_9 D_1 + \beta_{10} D_2 + \beta_{11} D_3 + \beta_{12} D_4 + \beta_{13} D_5 + \beta_{14} D_6 +$$

$$\beta_{15} OIC + \beta_{16} SAARC + \beta_{17} OECD + \beta_{18} ECO + \beta_{19} ASEAN + \beta_{20} CMEA \qquad (5)$$

Where
M= Total Imports from a specific country to Pakistan
$Yf =$ GDP of foreign country

$P_f =$ Population of foreign country

$Ay =$ Per capita GDP differential of Pakistan and foreign country

$TOF =$ Trade/ GDP Ratio of foreign country used as a proxy for trade openness

$FCR =$ Foreign Currency Reserves of foreign country

$RER =$ Real Exchange Rate
Dis= capital distance between Pakistan and foreign country

D_1 =dummy for adjacent country, =1 if foreign country share common border with Pakistan and zero other wise

D_2 = dummy for common official language (ENGLISH), =1 if foreign country use the English as an official language and zero otherwise

D_3 = dummy for colony, =1 if Pakistan was a colony of foreign country and zero otherwise

D_4 = dummy for common colony, =1 if foreign country was a colony of England and zero otherwise

D_5 = dummy for same Religion (ISLAM), =1 if population of foreign country is more than 50% belonging to Islam and zero otherwise

D_6 = dummy for landlocked countries, =1 if foreign country has no access to water transportation and zero otherwise

OIC= Dummy for Regional trading agreement, =1 if foreign country is member of OIC and zero otherwise
ECO= Dummy for Regional trading agreements, =1 if foreign country is member of ECO and zero otherwise
OECD= Dummy for Regional trading agreements, =1 if foreign country is member of OECD and zero otherwise
SAARC= Dummy for Regional trading agreements, =1 if foreign country is member of SAARC and zero otherwise
ASEAN= Dummy for Regional trading agreements, =1 if foreign country is member of OASEAN and zero otherwise
CMEA= Dummy for Regional trading agreements, =1 if foreign country is member of CMEA and zero otherwise

Data

Pakistan's Imports are considered on Annual basis from 1970-2009. This data was obtained from the Direction of Trade Statistics yearbook (various issues) published by the International Monetary Fund (IMF). Data on GDP, GDP per capita, exchange rates, total imports, and total exports were obtained from the World Development Indicators (2010) database. Likewise, data on the consumer price index (CPI) was obtained from the International Financial Statistics database.CPI data was used in construction of Real Exchange rate variable. Data on distance (km) between Islamabad (the capital of Pakistan) and the capital cities of other countries were obtained from The World fact Book (CIA, 2011). Construction of variables and Unit of measurement with other details are presented in Appendix-A.

Results and Discussions

Our analysis based on cross-section data for the sample of 150 countries. For each cross-section, periods from 1970-2009 are considered. A separate gravity equation for each segment of 5-years average have been estimated in order to get a better insight liaison of import determining variable. The first segment comprises of 1970-74 for which results are reported in Table 1.1 gives an idea about the relationship of Pakistan's import with foreign income, which is positive and significant. It illustrates the supply condition of trading country in a way with the increase in foreign income import of Pakistan will also increases. Because according to literature whenever there is an increase in income, new means of productions and advanced technological adaptation reduces the cost of production, generating economies of scale. In this manner imported goods become cheaper which enhances the demand. The coefficient value is different for eight models estimated but it lie between the range from 1 to 3, which indicates if foreign income will be increased by 1%, imports will be increased in average by 2%. For example Model-4 for import indicates that a one percent increase in foreign income leads to three percent increase in import flows from the foreign countries.

Table 1.1
Gravity Model for Imports (1970-89)

Years	Model-1 1970-1974		Model-2 1975-79		Model-3 1980-84		Model-4 1985--89	
Variables	Coefficient	t-value	Coefficient	t-value	Coefficient	t-value	Coefficient	t-value
Foreign GDP	2.351073	1.831871	1.0383	1.44089	0.79857	-2.45985	3.330076	3.709373
Distance	-5.63509	-1.75586	-2.11166	-2.9228	-3.35069	-1.78367	-2.12852	-1.838
Foreign Populatin	-0.267567	1.094595	-0.088588	1.12665	-0.920408	2.540951	-1.75739	-1.96386
Absolute GDP Differential	0.214649	1.121302	0.371767	1.7195	0.679425	2.578846	1.27122	-2.13486
Trade-Openess	-0.660975	1.179396	-0.361118	0.40103	-2.16766	-1.92373	-0.362813	2.244369
Real Exchange Rate	-0.274954	1.253821	-0.006919	1.14214	-0.017002	1.097548	-0.024943	1.320493
Foreign Currency Reserves	0.164492	0.122425	0.20194	1.60766	1.185719	1.487379	0.1988	-1.40147
Adjacency	-9.75394	-0.93752	-5.59528	-1.8545	-7.48801	-0.96521	-5.85006	-1.16376
common Language	-6.92062	-2.13009	-0.27656	-0.406	-2.54736	-1.41059	-0.67454	-0.56454
Colony	6.600106	0.576283	1.382041	0.56801	3.728886	0.557612	1.346949	0.304057
common Colony	4.361264	1.23953	1.587744	2.15888	1.23322	0.616508	1.326788	1.005821
Religion	-2.99693	-0.70637	-1.16074	-1.2599	-2.30839	-1.1133	0.410161	0.320564
land-locked	-3.79472	-0.96959	-1.00824	-1.1945	-2.472	0.21753	-0.38479	0.287831
OIC	0.232505	0.033359	1.312124	0.90529	1.67316	0.461168	1.305579	0.562344
SAARC	1.905488	0.300506	1.568983	1.16713	1.740006	0.480756	0.733126	0.303142
OECD	-4.3358	-0.78192	-0.19293	-0.1625	-0.65645	-0.20446	-1.01698	-0.48136
ECO	5.596236	0.572305	1.000061	0.42958	1.386245	0.214154	0.092205	0.021872
ASEAN	-0.33322	-0.03689	0.697847	0.35924	-2.17585	-0.4522	0.878886	0.287189
CMEA	0.135	0.005	1.232338	0.53404	0.931624	0.147328	0.989621	0.238434
R-squared	0.442234		0.71481		0.418195		0.532847	
Adjusted R-squared	0.287776		0.61974		0.260276		0.412902	

The distance variable is significant and carries negative sign in all the model estimated, showing import coming from distant countries is lower than that from the countries which are near in proximity, because distance causes increase in all type of cost. Proximity does not mean that countries are in our neighborhood. It shows the extent of relative cost incurred in the process of transportation of a commodity from one place to another.

In most of the cases, the coefficient associated with differential in absolute per capita income is significant and positive, estimated value shows that import flows follow H-O (Heckshar-Ohlin) hypothesis. Our result in favor of H-O model depicts the base of our import. It shows that our import will increase with an increase in the per capita GDP differential with foreign countries and it supports the concept of Heckscher-Ohlin, which bases the trade between countries (on the comparative advantage) on difference in factor endowments among them.

The effect of foreign population on our import is negative and it is significant, showing lesser imports flows from larger economies, which implies absorption effect in these economies might be stronger than economies of scale impact. It shows with larger population size countries consume most of the portion of their production and export less.

As for as the coefficient of trade-openness is concerned it is significant and showing negative relationship with import flows of Pakistan in nearly all of the models estimated. It depicts that import is not affected by Trade-openness measures. Pakistan's import demand is very stable may not affected by adopting the openness measures but it may affect by the rise in exchange rate. In our analysis real exchange rate has depicted significant result , which shows that our import demand decreases with an increase in the real exchange rate and vice versa. The rise in exchange rate increases the cost of import in terms of their price subsequently demand decreases.

Foreign currency reserves (FCR) has significant effect on our import demands. Its positive relationship with import demand shows that Pakistan's import demand is more from the economies which are economically stronger. This might be because of their competitive position in world economy. As we know that the main source of foreign currency reserves are exports of a country. The country which possesses more FCR implicitly depict the strong position from exports side revenue, more export

implicitly shows the export competitiveness of that country over world so obviously demand from such countries will be more than from the others.

The dummy variable for adjacency is used to capture the import flow of Pakistan from its neighbor countries with which it is sharing a common border. But unfortunately we have suffered from several decade internal political disputes and ongoing confrontation with neighboring countries. Our adjacency variable in the study is showing negative relationship in the models estimated for the period of eighty's while it is positive when estimated for the period of twenty's showing the friendly attitude towards neighbors in this period which is the need of time.

Table 1.2
Gravity model for Imports (1990-2009)

Years	Model-5		Model-6		Model-7		Model-8	
	1990-94		1995-99		2000-2004		2005-2009	
Variables	Coefficient	T-value	Coefficient	T-value	Coefficient	T-value	Coefficient	T-value
Foreign GDP	2.421137	1.86613	2.288941	4.1103	0.634116	0.98607	1.275355	1.27533
Distance	-3.09584	-1.9285	-1.9085	-3.5134	-1.96022	-2.9485	-1.45174	-1.2455
Foreign population	-2.24836	-1.9219	-1.02916	-1.9091	0.126502	0.21852	-0.67134	-0.7133
Absolute GDP Differential	1.38112	-1.598	0.63095	-1.4627	0.345902	0.83044	0.1241	-0.1901
Trade-Openess	-2.59233	-1.3111	-0.58174	-2.8259	-1.11142	-1.3647	-1.33785	-2.9334
Real Exchange Rate	0.13882	1.87758	0.01628	-2.2976	0.044153	1.58444	0.0121	-2.1231
Foreign Currency Reserves	0.842974	1.04456	0.11464	-1.3738	0.451629	1.26527	0.68889	1.055
Adjacency	6.50335	-1.0719	3.50095	-1.5445	2.89768	-1.0076	2.14172	-1.4279
Common Language	-1.06174	-0.5883	-0.29743	-0.4246	-0.29227	-0.3193	-0.42214	-0.2388
Colony	3.377264	0.5065	2.438583	0.86018	2.109075	0.56541	2.661652	0.41169
Common Colony	3.111904	1.6038	2.08599	2.73533	1.980785	1.95721	2.795223	1.44108
Religion	1.340435	0.72052	0.059444	0.08565	-0.84513	-0.9698	1.79519	1.17507
Land-locked	-0.632581	1.37464	-1.176537	2.27255	-1.380476	1.75002	-0.26204	-1.1884
OIC	0.5864	-1.1807	0.536032	1.41888	1.526039	1.90167	0.79367	-2.266
SAARC	1.887598	0.51583	1.499598	1.00499	2.480001	1.249	1.976548	0.58193
OECD	-0.96194	-0.3313	-1.6255	-1.3702	-1.1512	-0.7374	-1.06295	-0.3891
ECO	0.401503	0.06129	0.123039	0.0449	1.826242	0.5107	0.342	-0.0559
ASEAN	-1.34163	-0.3376	-0.29437	-0.2098	-0.11599	-0.0639	0.327218	0.10247
CMEA	2.16434	1.64581	1.020817	1.80898	0.260105	1.15686	1.656008	2.57318
R-squared		0.37133		0.64717		0.53083		0.6126
Adjusted R-squared		0.2415		0.58623		0.45331		0.607

As for as the dummy variable for religion is concerned it is significant only in the few models. Similarly the dummy use for regional trade agreement is significant for OIC and CMEA in few models and for SAARC in the start of new century having correct positive sign implies that more import flows from countries having same regional trading agreement. It can be attributed to the pace of trade liberalization. The government removed the non-tariff barriers (NTB) and replaced them with tariffs measures, accompanied by reduction in maximum tariff rate. In the early 1990s, imports rose steeply primarily due to the continued import liberalization policies. The government took various steps for liberalizing imports which included abolishment of the system of free and banned imports in 1983 and the Introduction of a negative list items. Furthermore in 1997 reforms were aimed at the liberalization of the economy. These reforms provided for tariff cuts on imports, reducing the top rates for customs duties from 65 percent to 45 percent import duties on a host of raw materials. All these policies changes have affected the behavior of our variable used in the model as it is evident from the significance of regional trading agreements during the twenty's.

In the same fashion, the result of SAARC dummy indicates the changing environment in the region, the status of this regional trade organization at Eight SAARC summit in India had taken a new direction by establishing a South Asian Free Trade Area (SAFTA) on the lines of the European Free Trade Area (EFTA) in order to liberalize intra-regional trade. This economic cooperation has increased the significance of SAARC and it is depicted in our result estimated for the later periods.

In our sample period, common colony is the only variable among the class of dummy variables that turns out to be significant. It shows that our import flows are on average 395 percent [= (exp1.6-1)100] higher with countries having common colony for the1970-89 estimating period. Similarly on averageModel-6, Model-7 and Model-8 shows that due to common colony our import flows [= (exp2.2-1)*100] are 803 percent higher and this effect is significant. The significance of this variable reflect a fact that cultural similarities among nations play a vital role in trade relations among themselves as this variable reveals that Pakistan trades is more with the countries which remained a colony for England in history, because such countries have historical linkages and cultural similarities.

Among other dummy variables the dummy for landlocked countries shows its significant result in some model estimated. This is an indication that cost of transportation increased if a country has no access to water as a result decreasing the demand for import. R-square and adjusted R-square results are satisfactory for cross-sectional data.

Conclusion

Results of our study are ambiguous, the variables which were significant during initial time period defined for our analysis become insignificant in later on sometimes and vice versa. The sign attached to them have also changing behavior in some cases. This is all due to the changing environment of policies and all over the world fluctuating economic behavior. This is the beauty of our analysis that gravity model has captured the real situation of import at all specified time period defined.

After analyzing the gravity model for import, it can be inferred that most important variable that significantly affects the flows is foreign GDP and the distance between Pakistan and its trading partners.

Absolute difference in per capita income between Pakistan and its trading countries is yet another variable affecting Pakistan's flows. Favorable results are obtained in supports of H_O Model hypothesis for import demand. Foreign currency reserves of trading countries have also significant impact on flows, increase in reserves of trading countries resulted in increasing the demand for import flows. Common colony appears to be the only variable in the class of qualitative variables, which has significant and positive influence on our flows in almost all models estimated. This implies that cultural familiarity between Pakistan and other countries enhances the amount of Pakistan's trade.

Dummy for regional trade agreement is only significant for OIC, CMEA and SAARC after 1990. Its behavior changed over time implying that such trade arrangements are very effective in enhancing our trade in future.

It is evident from our results that trade policies and economic status of a country play an important role in determining the relationship of trade between two countries. The behavior of all variables depends on the economic position of a country at the time of estimation.

Overall gravity model seems to be a good tool in explaining trade flows and it also shows that the gravity model is applicable to the single-country case.

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Appendix-A

Data Source and Munipulation

Variables	Exact definition	Notations	Source	Unit	Expected Sign
Bilateral trade volume between home country and foreign country	Exports of Pakistan to "j" Plus imports from "j" trading partner to Pakistan in a specific year	T_j	IMF Direction of Trade Statistics	Current US dollar Billions	-------------
Volume of Exports	Total volume of exports from Pakistan to "j" trading partner in a specific year.	X_j	IMF Direction of Trade Statistics	Current US dollar Million	--------------
Volume of Imports	Total volume of imports from "j" trading partner to Pakistan in a specific year	M_j	IMF Direction of Trade Statistics	Current US dollar Millions	--------------
Gross Domestic Product	GDP of "j" trading partner in a specific year	y_f	World Development Indicators	Current US dollar Billions	Positive
Population	Population of "j" trading partner in a specific year.	p_f	World Development Indicators	Million of inhabitants	Ambiguous
Relative absolute difference	Relative absolute difference=difference of per capita GDP of Pakistan and its "j" trading partner in a specific year	AY	World Development indicators	Current US dollar	Positive(HO theory) Negative(Linder theory)
Real Exchange Rate	Real exchange rate for Pakistan is defined as RER=NER/NERj* CPIj/CPI Where NER is Nominal Exchange rate and CPI is Consumer Price Index.	RER	IMF International Financial Statistics.	LCU/US dollar constant at 2000	Positive
Distance	It is great circle distance between geographic centers of Pakistan and its "j" trading partner.	DIS	Coordinates from the CIA (The World Fact Book)	Kilometers	Negative
Trade Openness	It is trade / GDP ratio of "j" trading partner in a specific year.	TOF	World Development Indicators	Local units	Positive
Foreign Currency Reserves	It is total currency reserves minus gold for "j" trading partner in a specific year.	FCR	IMF International Financial Statistics .	Current US dollar	Positive

Note: "j" is used to shows the specific foreign country

Common Language	It is a dummy for common official language, it is equal to 1 if "j" trading partner share a common official language with Pakistan. English in our study	D2	The CIA(The World Fact Book 2010)	----------	Positive
Contingency	It is a Border dummy, it takes the value of"1" if the border of "j" trading partner is adjacent with Pakistan	D1	The CIA(The World Fact Book)	----------	Positive
Religion	It is a Religion dummy; it takes the value of 1 if "j" trading partner is Muslin country	D5	The CIA	-------------	Positive
Common Colony	This dummy takes the value of 1 if "j" trading partner country remained the colony of British.	D4	---------	--------------	Positive.
Landlocked	Landlocked dummy takes the value of "1" if "j"trading partner is landlocked having no access to water transport.	D6	-----------------	-------------	Negative
OIC (Regional Trade Agreement)	This dummy takes the value of "1" for the countries who are member of OIC, and 0 otherwise.	OIC	---------------	------------	Positive
OECD(Regional Trade Agreement)	This dummy takes the value of "1" for the countries who are member of OECD, and 0 otherwise.	OECD	--------------------	----------	Positive
ECO(Regional Trade Agreement)	This dummy takes the value of "1" for the countries who are member of ECO, and 0 otherwise.	ECO	--------------------	-------------	Positive

Note: "j" is used to shows the specific foreign country
Continued------

SAARC(Regional Trade Agreement)	This dummy takes the value of "1" for the countries who are member of SAARC, and 0 otherwise.	SAARC	The CIA (The World Fact Book)	-------------	Positive
CMEA(Regional Trade agreement)	This dummy takes the value of "1" for the countries who are member of CMEA, and 0 otherwise.	CMEA	The CIA (The World Fact Book)	-------------	Positive
ASEAN(Regional Trade Agreement)	It takes the value of "1" for the countries who are member of ASEAN, and 0 otherwise	ASEAN	The CIA (The World Fact Book)	-------------	Positive