The new version of gravity model in explaining bilateral trade. "A comparative study for developed and developing nations"

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The new version of gravity model in explaining bilateral trade. "A comparative study for developed and developing nations"

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Abstract. World trade has grown rapidly. Several factors are highlighted by literature as the driving forces behind the growth of world trade. Reductions in barriers to trade are one of them. A comprehensive empirical investigation is carried to ascertain the trade reducing and increasing effect of barriers to trade and facilitators to trade. The new version of gravity model is developed in the connections in this study while analyzing the effect of GDP, distance, remittances, FDI, transportation cost, exchange rate, inflation, population, import and export of specifically trading partners on trade flows during bilateral trade. The study revealed that the developed version of gravity model explains the trade flows substantially and vigorously for the nations from developed world than for the nations from developing world.

Keywords: : Gravity model, Export, Import, Trade barriers, Trade facilitators

1 Introduction

From the past few years focus has been shifted to trade liberalization because of negative effect of barriers to trade on the growth and development of the Economy. Trade has a quantitatively large, robust, positive, significant and evident impact on income (Frankel and Romer, 1996). Since 2003, trade improvement has generated economic growth and trade surplus (United Nations, 2008).

The Main aim of this study is to analyze the determinants of bilateral trade and to find the affect of determinants and barriers on trade with the use of gravity model, which takes into account the affect of them simultaneously on exports and imports. In this study the gravity model is applied on 30 developed and developing countries for the last ten-years (2001-2010). The model developed in this study analyzed the affect of GDP, distance, remittances, foreign direct investment, transportation cost, exchange rate, inflation, population, import and export of trading partners on nation's trade flows.

2 Research Problem

Growth in the volume of trade is seen in almost every industry and in all the economies, particularly in developed and he developing economies. There is an argument against what is the reason behind the growth of world trade. Various reasons have been highlighted in literature. This research analyzes the factors that positively or negatively influence trade of the nation's selected for this study.

3. Specific Objective

A comprehensive empirical investigation is carried out to find out the answers of the following questions:

What are the determinants of bilateral trade?
Is there any relationship of tariff, non tariff barriers with trade flows?
Does theory of offer curve apply during the investigation of trade flows?
What are the trade barriers and trade facilitators, which are affecting individual countries in both developed and developing nations?

4. Scope and Justification for the Research

The finding of this study is applicable to the developed and developing nations, though the results may be interpreted for other nations with suitable amendments in data with respect to the factors and data of the country. This can be a very helpful tool for the development and growth of the economy. Factors having positive relationship to trade can be improved for increasing trade and factors having negative affect can be avoided to uplift the trade.

5. Literature Review

"From 1950–2004, world trade grew at a rapid average rate of 5.9 percent per Annum" (Hummels, 2007, p. 131). As stated in World Trade Report "Robust expansion and growth in trade is witnessed in case of for both developed and least developed economies" (World Trade Report, 2007, p. 1). According to world trade report in the year 2006 world economy has witnessed robust growth and vigorous trade expansion (World Trade Report, 2007). Exports of world merchandise grew in real terms by 8.0 % (World Trade Report, 2007). In 2006 World commercial services exports increased by 11 % to $2.7 trillion (World Trade Report, 2007).

6. Why has World Trade Grown?

According to Krugman (2002) answer to the fundamental query ''Why has world trade grown?'' is still uncertain (Baier and Bergstrand, 2001). Several reasons have been highlighted by literature to explain the growth of world trade. According to Feenstra (1998) there are four possible factors to explain the growth of world trade: 1) trade liberalization 2) falling transportation costs 3) economy's size and 4) increased outsourcing (Baier & Bergstrand, 2001).

Krugman (2002) also noted that trade liberalization and falling transportation cost have affected the growth of world trade positively. Hummels and Levinsohn (1995) and Helpman (1987) suggested that economies have converged in economic size is the main reason behind the growth of world trade. According to Baier and Bergstrand (2001), the variables those have none trivially contributed to the real growth of world trade are income growth, tariff rate reductions, and transport-cost declines.

It can be concluded that, trade liberalization, falling transportation costs, tariff rate reductions, technology and globalizations are the key factors that have contributed in the growth of world trade.

7. Trade Liberalization and Its Impact on Trade and Growth of World Trade

Studies have shown that Liberalization is positively and significantly affecting the growth and development of nations. It helps in reduction of poverty. Krugman (1995), Feenstra (1992) and Romer (1994) research showed that trade liberalization increases the volume of trade and protectionism against trade reduces the import of goods.

On the other hand some other researches contradicted theses studies by concluding that there is little or no impact of trade liberalization on the growth of world trade. According to Lai and Zhu, (2004) the affect of trade liberalization on overall world trade is not large. Some other studies has also shown that trade liberalization has a disappointing impact on trade flows (Hansberg, 2005). Empirical result of studies conducted by Baldwin & Lewis (1978), Cline, Kawanabe, Kronsjo & Williams (1978), Ray (1981), Deardorff & Stem (1986), Bhagwati (1988), and Leamer (1990) reported that there is comparatively small affect of trade liberalization on imports.

Recent studies done by Leamer (1990), Harrigan (1993), and Trefler (1993) suggested that trade liberalization has considerably larger, significant and robust impact on trade and world trade has grown because of trade liberalization.

8. Barriers and Determinants of Bilateral to Trade

According to Gonzales, Bailes and Amano (1991) International Trade barriers can be classed into three parts i.e. Tariff Barriers, Institutional Barriers and Non Tariff barriers.

"Tariffs are the most common tool for regulating imports. They are used to protect domestic industries from foreign competition, to protect balances of payments, or to raise revenues" (United Nations, 2008, p.73)."The effective tariff does not measure protection to domestic resources vis-a-vis those of the rest of the world. All that is considered is the difference in value-added contribution by domestic resources with and without a tariff structure" (Waters, 1970, p. 1013).

Tariff measures are used to raise fiscal revenue or to defend domestic industry from foreign competition .When a product crosses the boundary or custom area, Tariff measures are applicable. It raises the import price of the product by a fixed quantity or a fixed proportion. The increase in price depends on the value and quantity of the product (United Nations, 2008). Institutional Barriers: These are usually political in origin. It is a form of relationship or agreement such as general agreements on tariff and trade (GAAT) between two countries or among a number of countries that are intended to encourage and protect trade among those who are included in the agreements often to the exclusion of others.

In addition to tariffs, Non tariff barriers (NTBs) are often used to control imports and hence bilateral trade. According to Hillman (1991) NTB's are all limitations, except traditional customs duties which distort international trade. Any governmental tool or practice except tariff which directly hinders the entrance of imports into an economy and which discriminates imports, but are applicable with equal and same force on domestic production or distribution i.e exports (Beghin & Bureau, 2001). Typical non-tariff measures include quantity control measures such as licensing, quotas and prohibitions, as well as price control measures, health and safety measures (United Nations, 2008).

Non tariff barriers also constitute of regulatory barrier, cultural barrier, and industry barrier. Some of the studies have categorized barriers into artificial and natural barriers. Artificial barriers are self created barriers and natural barriers are not self created (Balassa, 1965 & 1982; Basevi, 1966; Corden, 1966 & 1971).

9. Gravity Model

Gravity model has been exceptionally popular and accepted. It applies the gravitational force theory as an analogy to explain the volume of trade, migration, capital flows, and product differentiation. According to Deardorff (1998) it is explained as a "fact of life" since it has significant explanatory power.

The theory of gravity is originated in physics, referring to Newton's law of gravity (Kristjánsdóttir, 2005). Gravity Model is derived by the Neworld Trade Report's "Law of Universal Gravitation" which explicates the attractive force between two objects. Gravity model merged Neworld trade organization Newton's law with trade according to the law, attraction of two countries' masses, weakened by barriers between them and enforced by trade agreements these economies belong to.

The gravity model when applied in economics or international trade it assumes that import and exports are the gravity force whereas determinants of trade are "economic mass". The model is used to explain the driving forces of trade, in economics i.e. what forces one country to trade with another during the bilateral trade.

Tinbergen (1962) and Poyhonen (1963) were the pioneers who applied the idea of gravity model to international trade flows. It is "workhorse for empirical studies of the pattern trade" and the "standard empirical framework used to predict how countries match up in international trade" (Bayoumi & Eichengreen, 1997; Irwin, 1997; Rauch, 1999, p. 10).

According to Tinbergen (1962) the gravity equations of bilateral trade signify: Total potential supply of the exporting country on the world market, Total potential demand of the importing country on the world market; and barrier to trade between the two countries concerned. Many studies have revealed that the gravity equation is persistent with many standard models of international trade or it can be transformed into gravity like equations under certain assumptions (Beghin and Bureau, 2001).

The standard gravity model is upgraded with several variables to test whether these variables are significant in explaining trade or not. Gravity model, in its basic form, assumes that trade between countries can be compared to the gravitational force between two objects: it is directly related to countries' size and are inversely or negatively related to the distance between them (Krugman, 1995).

According to Deardorff (1984), the empirical success of the gravity equation is due to the fact that it can explain some real phenomena, which the conventional factor endowment theory of international trade cannot, such as, the trade between industrialized countries, the intra industry trade and the lack of dramatic reallocations of resources when trade liberalization processes have taken place (Sanso, Cuairan & Sanz, 1993).

10 Research Methods

10.1 Gravity Model for Bilateral Trade

The following version of gravity model is proposed and used to investigate the barriers/ the facilitators of export volumes via bilateral trade for the nations from the developed and the developing world:

$$X_{ij} = f\,(POP_i, POP_j, GDP_i, GDP_j, FDI_i, FDI_j, INF_i, INF_j, REM_i, REM_j, ER_i, ER_j, TCX_{ij}, DIS_{ij}, T_{ji}, M_{ij}) + \varepsilon \quad (a)$$

Where, i is an exporting country, while j is an importing nation, whereas, Xij is the value of total export from country i to j, POP_i is the population of the exporting country and POP_j is the population of the importing country, GDP_i and GDP_j are the GDP of exporting and importing countries i and j respectively, FDI_i and FDI_j are the Foreign Direct investment level in country i and j respectively, INF_i is the inflation rate prevailing in country i whereas INF_j is the inflation rate prevailing in country j, REM_i is the amount of remittances received in country i and REM_j is the amount of remittances received in country j, ER_i and ER_j stands for the exchange rate of country i and j respectively, TCXij is the transportation cost for export, DISij measures the distance between the two trading partners i and j, T_{ji} is tariff rate imposed by country j on i and M_{ij} is the total value of import from country j to i.

The model shows that export from country i to j is the function of population, GDP, foreign direct investment, inflation, remittances and exchange rate of both importing and the exporting country, Transportation cost for export, Distance between the trading countries, tariff imposed by j that is importing country and the import form country j to i. The model (a) holds the following regression form:

$$X_{ij} = \alpha - \beta_1 POP_i - \beta_2 POP_j + \beta_3 GDPi + \beta_4 GDP_j + \beta_5 FDI_i + \beta_6 FDI_j - \beta_7 INF_i - \beta_8 INF_j + \beta_9 REM_i + \beta_{10} REM_j, - \beta_{11} ER_i - \beta_{12} ER_j - \beta_{13} TCX_{ij} - \beta_{14} DIS_{ij} + \beta_{15} M_{ij} - \beta_{16} T_{ji} + \varepsilon \quad (b)$$

For the import volumes via bilateral trade, the following version of gravity model is proposed and used for the nations from the developed and the developing world:

$$M_{ij} = f\ (POP_i, POP_j, GDP_i, GDP_j, FDI_i, FDI_j, INF_i, INF_j, REM_i, REM_j, ER_i, ER_j, TCM_{ij}, DIS_{ij}, X_{ij}, T_{ij}) + \varepsilon \quad (c)$$

For the equation (c), the variables hold the same previous operational definitions, which includes Mij is the value of total imports to country i from j, POP_i is the population of the exporting country and POP_j is the population of the importing country, GDP_i and GDP_j are the GDP of exporting and importing countries i and j respectively, FDI_i and FDI_j are the Foreign Direct investment level in country i and j respectively, INF_i is the inflation rate prevailing in country i whereas INF_j is the inflation rate prevailing in country j, REM_i is the amount of remittances received in country i and REM_j is the amount of remittances received in country j, ER_i and ER_j stands for the exchange rate of country i and j respectively, TCXij is the transportation cost for export, DISij measures the distance between the two trading partners i and j, T_{ji} is tariff rate imposed by country j on i and X_{ij} is the total value of exports from country i to j.

$$M_{ij} = \alpha - \beta_1 POP_i - \beta_2 POP_j + \beta_3 GDPi + \beta_4 GDP_j + \beta_5 FDI_i + \beta_6 FDI_j - \beta_7 INF_i - \beta_8 INF_j + \beta_9 REM_i + \beta_{10} REM_j, - \beta_{11} ER_i - \beta_{12} ER_j - \beta_{13} TCM_{ij} - \beta_{14} DIS_{ij} + \beta_{15} X_{ij} - \beta_{16} T_{ji} + \varepsilon \quad (d)$$

10.2 Hypotheses

To investigate the above gravity models the following hypotheses are developed and tested:

H1: Tariff imposed by the trading partner has a negative effect on the export of a country.

H2: Distance between trading partners is negatively related to export.

H3: Distance between trading partners is negatively related to import.

H4: Population of the trading partner has negative effect on a country's export.

H5: Population of the trading partner has negative effect on a country's import.

H6: Exchange rate of trading partner is negatively related to a country's export.

H7: Exchange rate of trading partner is negatively related to a country's import.

H8: GDP of trading partner has positive effect on export.

H9: GDP of trading partner has positive effect on import.

H10: Foreign direct investment for trading partner is positively related to the country's export.

H11: Foreign direct investment for trading partner is positively related to the country's import.

H12: The inflow of remittances in trading country has a positive effect on export.

H13: The inflow of remittances in trading country has a positive effect on import.

H14: Inflation rate of trading partner has a negative effect on the export of a country.

H15: Inflation rate of trading partner has a negative effect on the import of a country.

10.2 Sample Size

A sample of 300 observations has been taken for the 15 developed nations which includes UNITED STATES, UNITED KINGDOM, FRANCE, GERMANY, AUSTRIA, CANADA, ITALY, SWITZERLAND, JAPAN, REPUBLIC OF CHINA, SPAIN, SWEDEN, AUSTRALIA, BELGIUM, GREECE and 15 developing nations which were ARGENTINA, BRAZIL, CHILE, URUGUAY, CAMERON, EGYPT, MEXICO, TUNISIA, PAKISTAN, SRILANKA, IRAN, MALAYSIA, INDONESIA, INDIA, BANGLADESH for a period of ten years from 2001 to 2010.

10.3 Summary of the Result

For the effective investigation of proposed gravity model in explaining bilateral trade between the nations, a sample of 30 developed and developing nations is used.

The table 1 is the summary of gravity models for explaining exports and imports for each developing nations with the rest of the world. The R Square shows the amount of variance or change in the dependent variable (Exports or Imports) that can be explained or influenced by the predictors of gravity model which are stated in equations (b) and (d). It is quite evident in the findings that the proposed gravity models are successfully explaining the trade flows for all the selected nations. It can be seen from the Table 1 that $F > 3.84$, which states that predictors of gravity models designed for explaining exports and imports volume for bilateral trade are very significant as expected by chance and hence, explaining the dependent variables (i.e. Exports and Imports) for bilateral trades between each nation and rest of world.

The findings reveal that the Gravity models or predictors in the gravity models are strong and substantially significant in explaining the export from developed nations to the rest of world while the Gravity models designed for imports are also strong and substantially significant in explaining the imports for the above stated nations from the rest of world.

For the developing nations, the gravity models/ predictors in the gravity models are weaker but significant in explaining the Export to the rest of world while for the same nations, the designed gravity model for imports are also weaker.

Table 1. Summary of gravity model for explaining bilateral trade for each nation

	EXPORT VS REST OF WORLD		**IMPORTS VS REST OF WORLD**	
DEVELOPED NATIONS	**R2**	**F**	**R2**	**F**
1.UNITED STATES	0.920	225	0.886	152.330

2.UNITED KINGDOM	0.984	1205.88	0.980	960.400
3.FRANCE	0.887	153.9	0.746	57.565
4.GERMANY	0.997	6513.733	0.999	19580.40
5. AUSTRIA	0.386	12.322	0.849	110.201
6.CANADA	0.501	19.679	0.906	188.911
7.ITALY	0.674	40.523	0.713	48.693
8.SWITZERLAND	0.837	100.645	0.739	55.496
9.JAPAN	0.609	30.528	0.696	44.874
10.REPUBLIC OF CHINA	0.969	612.658	0.945	336.764
11.SPAIN	0.312	8.888	0.229	5.822
12.SWEDEN	0.763	63.100	0.699	45.516
13. AUSTRALIA	0.521	21.319	0.531	22.191
14.BELGIUM	0.551	24.053	0.542	23.195
15.GREECE	0.779	69.088	0.701	45.952
Model is significant at F>3.84				
DEVELOPING NATIONS	**R2**	**F**	**R2**	**F**
16.ARGENTINA	0.341	10.142	0.347	10.415
17.BRAZIL	0.359	10.977	0.338	10.007
18.CHILE	0.333	9.785	0.379	11.962
19.URUGUAY	0.258	6.815	0.235	6.021
20.CAMERON	0.248	6.464	0.278	7.547
21.EGYPT	0.346	10.369	0.381	12.064
22.MEXICO	0.411	13.677	0.462	16.831
23.TUNISIA	0.279	7.584	0.189	4.568
24.PAKISTAN	0.497	19.366	0.476	17.805
25.SRILANKA	0.479	18.020	0.489	18.756
26.IRAN	0.265	7.067	0.229	5.822
27.MALAYSIA	0.465	17.036	0.446	15.779
28.INDONESIA	0.481	18.165	0.504	19.916
29.INDIA	0.663	38.560	0.707	47.294
30.BANGLADESH	0.290	8.006	0.274	7.397
Model is significant at F>3.84				

To view our results please see the annex.

The analysis of bilateral trade for 30 nations via gravity model has shown very diverse result. The imports tariff imposed by the trading partners does not affect the exports for the all developed nations

considered in the research but it really affects the exports of some developing nations like Argentina and Chile. Whereas, the tariff imposed by the trading partners does affect the imports for the approximately all developed and developing nations. The distance between the trading partners negatively affects the Exports volume of approximately all developed and developing nations when they are in bilateral trade with the rest of the world, while this distance also affects negatively to imports volume of most of the developed and developing nations which is an important essence of gravity model. The populations of the trading partners on the other hand, also negatively affects the exports by both the developed and developing nations which implies that largely populated nations restricts exports by other nations and prefers domestic production more, in contrast to this the populations of the of trading partners positively affects the imports for most of the developed and developing economies which is quite getable as these findings are in accordance with the law of absolute advantage of international trade but it is also negative for few nations like France, Italy, Brazil, Mexico, Iran and Bangladesh. The exchange rates of trading partners either has no relations with exports or else it effects positively to export of few nations from both developed and developing worlds like US, Austria, Sweden, Cameron, Pakistan and India. The same exchange rates in relation with imports were found not associated with each other for almost all developed and developing nation except of Argentina, Brazil, and Indonesia. A very interesting finding revealed, when real GDPs of trading partners were investigated in relation with exports and imports volumes, and it was found that GDPs of trading partners does not affect both exports and imports volume of any developed and developing nations surprisingly. The FDIs of trading partners affect more positively to the imports volume than the exports volume of most trading nations including both developed and developing nations. The remittances and inflations of trading partners also do not have any significant impact on both the exports and imports volume of trading nations of developed and developing world.

11. Conclusion

This research was an attempt to investigate the determinants of bilateral trade of a nation with rest of world in context to the practicability of developed gravity model and it was found that the developed gravity model explains bilateral trade for each nation from developed and developing world. The result of the study for 15 developed and 15 developing nations indicates that the inflation, remittances, and GDPs of the trading partners have nothing to do with the exports and imports of both developed and developing trading nations, while imports tariff of trading partners somehow affects the exports of few trading nations but approximately across it affects the imports of both trading world which is the validations of theory of offer curve/ terms of trade of international trade. It was visibly found that the distance between the trading partner's matters negatively to both exports and imports for both the world while populations of trading partners affect negatively to exports but positively to imports of both world. The exchange rates of trading partners also found associated with the exports and imports volume of few nations but most from developing world. The study also revealed that the developed version of gravity model explains the exports and imports volume via bilateral trade huskily for most of developed nations than the developing nations but few from developing world like Pakistan and India the developed version of gravity model sufficiently explains the bilateral trades.

This study recommends to the policy makers of trading nations to ponder on players which really matter for the trade flows. Trade policy should be made and formulated accordingly by each trading nations via keeping the eye on the different behavior of gravity model for different nations. Furthermore, this enhanced version of gravity model also gives the validations of theory of offer curve/ terms of trade, which implies that the import tariff should be lifted by importing nations if they want to increase its export share. The developed gravity model also suggests to the policy maker for all trading nations that the trade flows should be encouraged only with the neighboring nation rather than that the other nations located attributably with distance.

12. References

Baier, S. L., & Bergstrand, J. H. (2001). The Growth of World Trade: Tariffs, Transport Costs, and Income Similarity. Journal of International Economics 53(1), 1-27.

Baldwin, R., & Lewis, W. E. (1978). U.S. Tariff Effects on Trade and Employment in Detailed SIC Industries: The Impact of International Trade on Investment and Employment. Washington: U.S. Department of Labor.

Basevi, G. (1966). The United States Tariff Structure: Estimates of Effective Rates of Protection of United States Industries and Industrial Labour. The Review of Economics and Statistics, 48, 147-160.

Beghin, J.C., & Bureau, J.C. (2001). Quantitative Policy Analysis of Sanitary, Phytosanitary and Technical Barriers to Trade. Economies International, 88, 107-130.

Bhagwati, J. (1988). Protectionism. Cambridge, MA: The MIT Press.

Cline, W. R., Kawanabe, N., Kronsjo, T. O. M., & Williams, T. (1978). Trade Negotiations in the Tokyo Round: A Quantitative Assessment. Washington: Brookings Institute.

Corden, W.M. (1966). The Structure of a Tariff System and the Effective Protective Rate. Journal of Political Economy, 74, 221-37.

Corden, W.M. (1971). The Substitution Problem in the Theory of Effective Protection. Journal of International Economics, 1(1), 37-57.

Deardorff, A. V. (1984). Testing Trade Theories and Predicting Trade Flows. In: R. W. Jones and P. B. Kenen (ed.). Handbook of International Economics, 467-517.

Deardorff, A. V. (1998). Determinants Of Bilateral Trade: Does Gravity Work In A Neoclassical World?. In Frankel, J. A. (ed.). The Regionalization of the World Economy. University of Chicago for NBER: Chicago, 7-22.

Deardorff, A. V., & Stem, R. (1986). The Michigan Model of World Production and Trade: Theory and Applications. Cambridge, MA: The MIT Press.

Feenstra, R.C. (1992). How Costly is Protectionism. Journal of Economic Perspectives, 6, 159-178.

Feenstra, R.C. (1998). Integration of Trade and Disintegration of Production in the Global Economy. Journal of Economic Perspectives, 31-50.

Frankel, J., & Romer, D. (1996). Trade and Growth: An Empirical Investigation. National Bureau of Economic Research, 5476.

Gonzales, M. V., Bailes, J. C., & Amano, M. M. (1991). A Multidimensional Approach to Understanding Non-Tariff Trade Barriers. American Economic Review, 69-76.

Hansberg, E. R. (2005). A Spatial Theory of Trade. American Economic Review, 95(5), 1464-1491.

Harrigan, J. (1993). OECD Imports and Trade Barriers in 1983. Journal of International Economics, 35, 91-111.

Helpman, E. (1987). Imperfect Competition and International Trade: Opening Remarks. European Economic Review, 31(1-2), 77-81.

Hummels, D. (2007). Transportation Costs and International Trade in the Second Era of Globalization. Journal of Economic Perspectives, 21(3), 152-3.

Hummels, D., & Levinsohn, J. (1995). Monopolistic Competition and International Trade: Reconsidering The Evidence. Quarterly Journal of Economics, 110, 799-836.

Irwin, D.A. (1997). Changing the Course of U.S. Trade Policy in the 1930's. National Bureau of Economic Research.

Kristjánsdóttir, H. (2005). What Drives Sector Allocation of Foreign Direct Investment in Iceland. Education Policy Research Unit, 05-08.

Krugman, P. R. (1995). America in the World Economy: Understanding the Misunderstandings. Japan and the World Economy, Elsevier, 7(2), 233-247.

Krugman, P. R. (2002). Was it All in Ohlin? A Centennial Celebration. MIT Press, Cambridge (MA), 1899-1999.

Lai, H., & Zhu, S. (2004). The Determinants of Bilateral Trade. Canadian Journal of Economics, 37 (2), 459-483.

Leamer, E. E. (1990). Latin American as a Target for Trade Barriers Erected by Major Developed Countries in 1983. Journal of Development Economics, 32, 337-368.

Poyhonen, P (1963). A Tentative Model for the Volume of Trade between Countries. Weltwertschaftliches Archive, 90, 93-100.

Rauch, J. E (1999). Networks versus Markets in International Trade. Journal of International Economics, 48, 7-35.

Ray, E. (1981). Tariff and Non-tariff Barriers to Trade in the United States and Abroad. Review of Economics and Statistics, 63, 161-168.

Romer, P. (1994). New Goods, Old Theory and the Welfare Cost of Trade Restrictions. Journal of Development Economics, 43, 5-38.

Sanso, M., Cuairan, R., & Sanz, F. (1993). Bilateral Trade Flows, the Gravity Equation, and Functional Form. Review of Economics and Statistics, 75, 266-275.

Tinbergen, J., (1962). Shaping the World Economy. Twentieth Century Fund, New York.

Trefler, D. (1993). Trade Liberalization and the Theory of Endogenous Protection: An Econometric Study of US Import Policy. Journal of Political Economy, 101(1), 138-60.
United Nations, (2008). Trade and Development Report 2008. UNCTAD, Geneva.
Waters, W.G. (1970). Transportation Costs, Tariffs, and the Pattern of Industrial Protection. American Economic Review, 60, 1013-20.
World Trade Report. (2007). Six Decades Of Multilateral Trade Cooperation: What Have We Learnt. World Trade Report 2007.

Table 2. SUMMARY HYPOTHESES FOR GRAVITY MODEL USED FOR EXPLAINING BILATERAL TRADE FOR DEVELOPED NATIONS

s. no.	Hypotheses	UNITED STATES			UNITED KINGDOM			FRANCE			GERMANY		
		P	Relation	Result	P	Relation	Result	p	Relation	Result	p	Relation	Result
H-1	Tariff imposed by the trading partner has a negative effect on the export of a country.	0.612	no-relation	rejected	0.293	no-relation	rejected	0.121	no-relation	rejected	0.070	no-relation	rejected
H-2	Distance between trading partners is negatively related to export.	0.023	negative	accepted	0.041	negative	accepted	0.001	negative	accepted	0.002	negative	accepted
H-3	Distance between trading partners is negatively related to import.	0.412	no-relation	rejected	0.001	negative	accepted	0.039	negative	accepted	0.312	no-relation	rejected
H-4	Population of the trading partner has negative effect on a country's export	0.719	no-relation	rejected	0.008	negative	accepted	0.413	no-relation	rejected	0.004	negative	accepted
H-5	Population of the trading partner has negative effect on a country's import.	0.029	positive	rejected	0.001	positive	rejected	0.049	negative	accepted	0.123	no-relation	rejected
H-6	Exchange rate of trading partner is negatively related to a country's export.	0.007	positive	rejected	0.912	no-relation	rejected	0.612	no-relation	rejected	0.091	no-relation	rejected
H-7	Exchange rate of trading partner is negatively related to a country's import.	0.371	no-relation	rejected	0.412	no-relation	rejected	0.479	no-relation	rejected	0.314	no-relation	rejected
H-8	GDP of trading partner has positive effect on export.	0.212	no-relation	rejected	0.123	no-relation	rejected	0.721	no-relation	rejected	0.621	no-relation	rejected
H-9	GDP of trading partner has positive effect on import.	0.792	no-relation	rejected	0.213	no-relation	rejected	0.321	no-relation	rejected	0.243	no-relation	rejected
H-10	FDI for trading partner is positively related to the country's export.	0.321	no-relation	rejected	0.071	no-relation	rejected	0.052	no-relation	rejected	0.001	positive	accepted
H-11	FDI for trading partner is positively related to the country's import.	0.024	positive	accepted	0.001	positive	accepted	0.000	positive	accepted	0.041	positive	accepted
H-12	The inflow of remittances in trading country has a positive effect on export.	0.491	no-relation	rejected	0.222	no-relation	rejected	0.071	no-relation	rejected	0.071	no-relation	rejected
H-13	The inflow of remittances in trading country has a positive effect on import.	0.601	no-relation	rejected	0.540	no-relation	rejected	0.213	no-relation	rejected	0.621	no-relation	rejected
H-14	Inflation rate of trading partner has a negative effect on the export of a country.	0.291	no-relation	rejected	0.421	no-relation	rejected	0.512	no-relation	rejected	0.512	no-relation	rejected
H-15	Inflation rate of trading partner has a negative effect on the import of a country.	0.621	no-relation	rejected	0.521	no-relation	rejected	0.210	no-relation	rejected	0.071	no-relation	rejected

s. no.	Hypotheses	AUSTRIA			CANADA			ITALY			SWITZERLAND		
		p	Relation	Result	p	Relation	Result	p	Relation	Result	p	Relation	Result
H-1	Tariff imposed by the trading partner has a negative effect on the export of a country.	0.712	no-relation	rejected	0.299	no-relation	rejected	0.929	no-relation	rejected	0.099	no-relation	rejected
H-2	Distance between trading partners is negatively related to export.	0.000	negative	accepted	0.032	negative	accepted	0.001	negative	accepted	0.000	negative	accepted
H-3	Distance between trading partners is negatively related to import.	0.212	no-relation	rejected	0.001	negative	accepted	0.030	negative	accepted	0.211	no-relation	rejected
H-4	Population of the trading partner has negative effect on a country's export	0.713	no-relation	rejected	0.001	negative	accepted	0.519	no-relation	rejected	0.000	negative	accepted
H-5	Population of the trading partner has negative effect on a country's import.	0.000	positive	rejected	0.001	positive	rejected	0.010	negative	accepted	0.213	no-relation	rejected
H-6	Exchange rate of trading partner is negatively related to a country's export.	0.005	positive	rejected	0.712	no-relation	rejected	0.612	no-relation	rejected	0.081	no-relation	rejected
H-7	Exchange rate of trading partner is negatively related to a country's import.	0.412	no-relation	rejected	0.412	no-relation	rejected	0.417	no-relation	rejected	0.315	no-relation	rejected
H-8	GDP of trading partner has positive effect on export.	0.519	no-relation	rejected	0.172	no-relation	rejected	0.817	no-relation	rejected	0.712	no-relation	rejected
H-9	GDP of trading partner has positive effect on import.	0.729	no-relation	rejected	0.312	no-relation	rejected	0.711	no-relation	rejected	0.710	no-relation	rejected
H-10	FDI for trading partner is positively related to the country's export.	0.721	no-relation	rejected	0.071	no-relation	rejected	0.052	no-relation	rejected	0.000	positive	accepted
H-11	FDI for trading partner is positively related to the country's import.	0.000	positive	accepted	0.000	positive	accepted	0.000	positive	accepted	0.412	no-relation	rejected
H-12	The inflow of remittances in trading country has a positive effect on export.	0.413	no-relation	rejected	0.220	no-relation	rejected	0.067	no-relation	rejected	0.071	no-relation	rejected
H-13	The inflow of remittances in trading country has a positive effect on import.	0.075	no-relation	rejected	0.301	no-relation	rejected	0.111	no-relation	rejected	0.821	no-relation	rejected
H-14	Inflation rate of trading partner has a negative effect on the export of a country.	0.219	no-relation	rejected	0.312	no-relation	rejected	0.621	no-relation	rejected	0.291	no-relation	rejected
H-15	Inflation rate of trading partner has a negative effect on the import of a country.	0.925	no-relation	rejected	0.231	no-relation	rejected	0.191	no-relation	rejected	0.071	no-relation	rejected

p= Significance value (p <.05)= Significant

C= shows that variables has constant values so there is no affect of variable on dependent variable

s. no.	Hypotheses	JAPAN			REPUBLIC OF CHINA			SPAIN			SWEDEN		
		p	Relation	Result	p	Relation	Result	p	Relation	Result	p	Relation	Result
H-1	Tariff imposed by the trading partner has a negative effect on the export of a country.	0.972	no-relation	rejected	0.213	no-relation	rejected	0.301	no-relation	rejected	0.712	no-relation	rejected
H-2	Distance between trading partners is negatively related to export.	0.125	no-relation	rejected	0.011	negative	accepted	0.049	negative	accepted	0.000	negative	accepted
H-3	Distance between trading partners is negatively related to import.	0.001	negative	accepted	0.019	negative	accepted	0.002	negative	accepted	0.304	no-relation	rejected
H-4	Population of the trading partner has negative effect on a country's export	0.354	no-relation	rejected	0.324	no-relation	rejected	0.009	negative	accepted	0.613	no-relation	rejected
H-5	Population of the trading partner has negative effect on a country's import.	0.101	no-relation	rejected	0.029	negative	accepted	0.000	positive	rejected	0.000	positive	rejected
H-6	Exchange rate of trading partner is negatively related to a country's export.	0.418	no-relation	rejected	0.731	no-relation	rejected	0.903	no-relation	rejected	0.005	positive	rejected
H-7	Exchange rate of trading partner is negatively related to a country's import.	0.093	no-relation	rejected	0.390	no-relation	rejected	0.410	no-relation	rejected	0.412	no-relation	rejected
H-8	GDP of trading partner has positive effect on export.	0.746	no-relation	rejected	0.741	no-relation	rejected	0.195	no-relation	rejected	0.471	no-relation	rejected
H-9	GDP of trading partner has positive effect on import.	0.160	no-relation	rejected	0.612	no-relation	rejected	0.224	no-relation	rejected	0.791	no-relation	rejected
H-10	FDI for trading partner is positively related to the country's export.	0.000	Positive	accepted	0.049	positive	accepted	0.098	no-relation	rejected	0.293	no-relation	rejected
H-11	FDI for trading partner is positively related to the country's import.	0.002	Positive	accepted	0.000	positive	accepted	0.000	positive	accepted	0.000	positive	accepted
H-12	The inflow of remittances in trading country has a positive effect on export.	0.130	no-relation	rejected	0.931	no-relation	rejected	0.080	no-relation	rejected	0.312	no-relation	rejected
H-13	The inflow of remittances in trading country has a positive effect on import.	0.217	no-relation	rejected	0.192	no-relation	rejected	0.061	no-relation	rejected	0.300	no-relation	rejected
H-14	Inflation rate of trading partner has a negative effect on the export of a country.	0.497	no-relation	rejected	0.491	no-relation	rejected	0.486	no-relation	rejected	0.271	no-relation	rejected
H-15	Inflation rate of trading partner has a negative effect on the import of a country.	0.240	no-relation	rejected	0.192	no-relation	rejected	0.531	no-relation	rejected	0.691	no-relation	rejected

s. no.	Hypotheses	AUSTRALIA			BELGIUM			GREECE		
		p	Relation	Result	p	Relation	Result	p	Relation	Result
H-1	Tariff imposed by the trading partner has a negative effect on the export of a country.	0.491	no-relation	rejected	0.077	no-relation	rejected	0.918	no-relation	rejected
H-2	Distance between trading partners is negatively related to export.	0.031	negative	accepted	0.000	negative	accepted	0.000	negative	accepted
H-3	Distance between trading partners is negatively related to import.	0.007	negative	accepted	0.421	no-relation	rejected	0.304	no-relation	rejected
H-4	Population of the trading partner has negative effect on a country's export	0.009	negative	accepted	0.011	negative	accepted	0.705	no-relation	rejected
H-5	Population of the trading partner has negative effect on a country's import.	0.000	positive	rejected	0.191	no-relation	rejected	0.000	positive	rejected
H-6	Exchange rate of trading partner is negatively related to a country's export.	0.701	no-relation	rejected	0.059	no-relation	rejected	0.001	positive	rejected
H-7	Exchange rate of trading partner is negatively related to a country's import.	0.613	no-relation	rejected	0.421	no-relation	rejected	0.380	no-relation	rejected
H-8	GDP of trading partner has positive effect on export.	0.292	no-relation	rejected	0.712	no-relation	rejected	0.236	no-relation	rejected
H-9	GDP of trading partner has positive effect on import.	0.213	no-relation	rejected	0.771	no-relation	rejected	0.841	no-relation	rejected
H-10	FDI for trading partner is positively related to the country's export.	0.071	no-relation	rejected	0.021	positive	accepted	0.310	no-relation	rejected
H-11	FDI for trading partner is positively related to the country's import.	0.000	positive	accepted	0.031	positive	accepted	0.000	positive	accepted
H-12	The inflow of remittances in trading country has a positive effect on export.	0.110	no-relation	rejected	0.071	no-relation	rejected	0.435	no-relation	rejected
H-13	The inflow of remittances in trading country has a positive effect on import.	0.802	no-relation	rejected	0.721	no-relation	rejected	0.590	no-relation	rejected
H-14	Inflation rate of trading partner has a negative effect on the export of a country.	0.352	no-relation	rejected	0.212	no-relation	rejected	0.285	no-relation	rejected
H-15	Inflation rate of trading partner has a negative effect on the import of a country.	0.593	no-relation	rejected	0.059	no-relation	rejected	0.623	no-relation	rejected

p= Significance value (p <.05)= Significant

C= shows that variables has constant values so there is no affect of variable on dependent variable

Table 3. Summary hypotheses for gravity model used for explaining bilateral trade for developing nations

s. no.	Hypotheses	ARGENTINA			BRAZIL			CHILE			URUGUAY		
		P	Relation	Result	P	Relation	Result	p	Relation	Result	p	Relation	Result
H-1	Tariff imposed by the trading partner has a negative effect on the export of a country.	0.004	Negative	accepted	0.085	positive	rejected	0.020	negative	accepted	0.262	no-relation	rejected
H-2	Distance between trading partners is negatively related to export.	0.000	Negative	accepted	0.912	no-relation	rejected	0.000	negative	accepted	0.105	no-relation	rejected
H-3	Distance between trading partners is negatively related to import.	0.000	Positive	rejected	0.763	no-relation	rejected	0.001	negative	accepted	0.801	no-relation	rejected
H-4	Population of the trading partner has negative effect on a country's export	0.005	negative	accepted	0.000	positive	rejected	0.014	negative	accepted	0.000	negative	accepted
H-5	Population of the trading partner has negative effect on a country's import.	0.353	no-relation	rejected	0.000	negative	accepted	0.187	no-relation	rejected	0.028	positive	rejected
H-6	Exchange rate of trading partner is negatively related to a country's export.	0.069	no-relation	rejected	0.096	no-relation	rejected	0.186	no-relation	rejected	0.562	no-relation	rejected
H-7	Exchange rate of trading partner is negatively related to a country's import.	0.007	positive	rejected	0.005	negative	accepted	0.709	no-relation	rejected	0.332	no-relation	rejected
H-8	GDP of trading partner has positive effect on export.	0.090	no-relation	rejected	0.458	no-relation	rejected	0.479	no-relation	rejected	0.939	no-relation	rejected
H-9	GDP of trading partner has positive effect on import.	0.048	no-relation	rejected	0.859	no-relation	rejected	0.077	no-relation	rejected	0.951	no-relation	rejected
H-10	FDI for trading partner is positively related to the country's export.	0.000	positive	accepted	0.019	positive	accepted	0.000	positive	accepted	0.000	positive	accepted
H-11	FDI for trading partner is positively related to the country's import.	0.675	no-relation	rejected	0.008	negative	rejected	0.555	no-relation	rejected	0.000	negative	rejected
H-12	The inflow of remittances in trading country has a positive effect on export.	0.537	no-relation	rejected	0.134	no-relation	rejected	0.408	no-relation	rejected	0.609	no-relation	rejected
H-13	The inflow of remittances in trading country has a positive effect on import.	0.060	no-relation	rejected	0.289	no-relation	rejected	0.818	no-relation	rejected	0.294	no-relation	rejected
H-14	Inflation rate of trading partner has a negative effect on the export of a country.	0.386	no-relation	rejected	0.485	no-relation	rejected	0.481	no-relation	rejected	0.477	no-relation	rejected
H-15	Inflation rate of trading partner has a negative effect on the import of a country.	0.324	no-relation	rejected	0.724	no-relation	rejected	0.020	positive	rejected	1.830	no-relation	rejected

s. no.	Hypotheses	CAMERON			EGYPT			MEXICO			TUNISIA		
		p	Relation	Result	p	Relation	Result	p	Relation	Result	p	Relation	Result
H-1	Tariff imposed by the trading partner has a negative effect on the export of a country.	0.079	no-relation	rejected	0.573	no-relation	rejected	0.283	no-relation	rejected	0.090	no-relation	rejected
H-2	Distance between trading partners is negatively related to export.	0.000	negative	accepted	0.021	negative	accepted	0.001	negative	accepted	0.000	negative	accepted
H-3	Distance between trading partners is negatively related to import.	0.421	no-relation	rejected	0.039	negative	accepted	0.037	negative	accepted	0.302	no-relation	rejected
H-4	Population of the trading partner has negative effect on a country's export	0.000	negative	accepted	0.521	no-relation	rejected	0.423	no-relation	rejected	0.000	negative	accepted
H-5	Population of the trading partner has negative effect on a country's import.	0.251	no-relation	rejected	0.023	negative	accepted	0.019	negative	accepted	0.175	no-relation	rejected

H-6	Exchange rate of trading partner is negatively related to a country's export.	0.049	positive	rejected	0.921	no-relation	rejected	0.747	no-relation	rejected	0.056	no-relation	rejected
H-7	Exchange rate of trading partner is negatively related to a country's import.	0.291	no-relation	rejected	0.472	no-relation	rejected	0.498	no-relation	rejected	0.342	no-relation	rejected
H-8	GDP of trading partner has positive effect on export.	0.693	no-relation	rejected	0.811	no-relation	rejected	0.855	no-relation	rejected	0.748	no-relation	rejected
H-9	GDP of trading partner has positive effect on import.	0.791	no-relation	rejected	0.621	no-relation	rejected	0.789	no-relation	rejected	0.775	no-relation	rejected
H-10	FDI for trading partner is positively related to the country's export.	0.000	positive	accepted	0.032	positive	accepted	0.051	no-relation	rejected	0.000	positive	accepted
H-11	FDI for trading partner is positively related to the country's import.	0.041	positive	accepted	0.000	positive	accepted	0.000	positive	accepted	0.035	positive	accepted
H-12	The inflow of remittances in trading country has a positive effect on export.	0.091	no-relation	rejected	0.071	no-relation	rejected	0.066	no-relation	rejected	0.088	no-relation	rejected
H-13	The inflow of remittances in trading country has a positive effect on import.	0.721	no-relation	rejected	0.123	no-relation	rejected	0.158	no-relation	rejected	0.218	no-relation	rejected
H-14	Inflation rate of trading partner has a negative effect on the export of a country.	0.333	no-relation	rejected	0.412	no-relation	rejected	0.593	no-relation	rejected	0.223	no-relation	rejected
H-15	Inflation rate of trading partner has a negative effect on the import of a country.	0.071	no-relation	rejected	0.213	no-relation	rejected	0.160	no-relation	rejected	0.060	no-relation	rejected

p= Significance value (p <.05)= Significant

C= shows that variables has constant values so there is no affect of variable on dependent variable

s. no.	Hypotheses	PAKISTAN			SRILANKA			IRAN			MALAYSIA		
		p	Relation	Result	p	Relation	Result	p	Relation	Result	p	Relation	Result
H-1	Tariff imposed by the trading partner has a negative effect on the export of a country.	0.719	no-relation	rejected	0.323	no-relation	rejected	0.219	no-relation	rejected	0.071	no-relation	rejected
H-2	Distance between trading partners is negatively related to export.	0.010	negative	accepted	0.032	negative	accepted	0.001	negative	accepted	0.000	negative	accepted
H-3	Distance between trading partners is negatively related to import.	0.219	no-relation	rejected	0.001	negative	accepted	0.041	negative	accepted	0.312	no-relation	rejected
H-4	Population of the trading partner has negative effect on a country's export	0.666	no-relation	rejected	0.002	negative	accepted	0.412	no-relation	rejected	0.000	negative	accepted
H-5	Population of the trading partner has negative effect on a country's import.	0.000	positive	rejected	0.000	positive	rejected	0.012	negative	accepted	0.123	no-relation	rejected
H-6	Exchange rate of trading partner is negatively related to a country's export.	0.002	positive	rejected	0.092	no-relation	rejected	0.692	no-relation	rejected	0.052	no-relation	rejected
H-7	Exchange rate of trading partner is negatively related to a country's import.	0.412	no-relation	rejected	0.421	no-relation	rejected	0.441	no-relation	rejected	0.421	no-relation	rejected
H-8	GDP of trading partner has positive effect on export.	0.219	no-relation	rejected	0.219	no-relation	rejected	0.444	no-relation	rejected	0.662	no-relation	rejected
H-9	GDP of trading partner has positive effect on import.	0.476	no-relation	rejected	0.921	no-relation	rejected	0.054	no-relation	rejected	0.732	no-relation	rejected
H-10	FDI for trading partner is positively related to the country's export.	0.312	no-relation	rejected	0.072	no-relation	rejected	0.053	no-relation	rejected	0.000	positive	accepted
H-11	FDI for trading partner is positively related to the country's import.	0.000	positive	accepted	0.000	positive	accepted	0.000	positive	accepted	0.049	positive	accepted
H-12	The inflow of remittances in trading country has a positive effect on export.	0.472	no-relation	rejected	0.090	no-relation	rejected	0.077	no-relation	rejected	0.099	no-relation	rejected
H-13	The inflow of remittances in trading country has a positive effect on import.	0.080	no-relation	rejected	0.104	no-relation	accepted	0.212	no-relation	rejected	0.321	no-relation	rejected
H-14	Inflation rate of trading partner has a negative effect on the export of a country.	0.291	no-relation	rejected	0.321	no-relation	rejected	0.512	no-relation	rejected	0.222	no-relation	rejected
H-15	Inflation rate of trading partner has a negative effect on the import of a country.	0.621	no-relation	rejected	0.992	no-relation	rejected	0.191	no-relation	rejected	0.070	no-relation	rejected

s. no.	Hypotheses	INDIA	INDONESIA	BANGLADESH

		p	Relation	Result	p	Relation	Result	p	Relation	Result
H-1	Tariff imposed by the trading partner has a negative effect on the export of a country.	0.212	no-relation	rejected	0.100	positive	accepted	0.291	no-relation	rejected
H-2	Distance between trading partners is negatively related to export.	0.000	negative	accepted	0.000	negative	accepted	0.001	negative	accepted
H-3	Distance between trading partners is negatively related to import.	0.311	no-relation	rejected	0.039	negative	accepted	0.047	negative	accepted
H-4	Population of the trading partner has negative effect on a country's export	0.777	no-relation	rejected	0.112	no-relation	rejected	0.119	no-relation	rejected
H-5	Population of the trading partner has negative effect on a country's import.	0.000	positive	rejected	0.237	no-relation	rejected	0.010	negative	accepted
H-6	Exchange rate of trading partner is negatively related to a country's export.	0.000	positive	rejected	0.137	no-relation	rejected	0.641	no-relation	rejected
H-7	Exchange rate of trading partner is negatively related to a country's import.	0.001	no-relation	rejected	0.000	negative	accepted	0.411	no-relation	rejected
H-8	GDP of trading partner has positive effect on export.	0.312	no-relation	rejected	0.000	positive	rejected	0.711	no-relation	rejected
H-9	GDP of trading partner has positive effect on import.	0.721	no-relation	rejected	0.755	no-relation	rejected	0.721	no-relation	rejected
H-10	FDI for trading partner is positively related to the country's export.	0.291	no-relation	rejected	0.826	no-relation	rejected	0.052	no-relation	rejected
H-11	FDI for trading partner is positively related to the country's import.	0.000	positive	accepted	0.669	no-relation	rejected	0.000	positive	accepted
H-12	The inflow of remittances in trading country has a positive effect on export.	0.412	no-relation	rejected	0.143	no-relation	rejected	0.067	no-relation	rejected
H-13	The inflow of remittances in trading country has a positive effect on import.	0.900	no-relation	rejected	0.252	no-relation	rejected	0.129	no-relation	rejected
H-14	Inflation rate of trading partner has a negative effect on the export of a country.	0.111	no-relation	rejected	0.440	no-relation	rejected	0.419	no-relation	rejected
H-15	Inflation rate of trading partner has a negative effect on the import of a country.	0.112	no-relation	rejected	0.232	no-relation	Rejected	0.992	no-relation	rejected

p= Significance value (p <.05)= Significant

C= shows that variables has constant values so there is no affect of variable on dependent variable