

## The Impact of Integration on International Trade Flows: the Cases of EU, OIC & ECO

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### Abstract

The growth of regional trade blocks has been one of the major developments in international relations in recent years. Regional agreements vary widely but, all have the objective of reducing barriers to trade between member countries that in most cases result in increasingly trade flows and economic growth. This paper attempts to explore the results of trade integration in ECO, EU and OIC blocks. For this purpose a "Gravity Panel Data Model" is specified to test the hypothesis in which economic integration among countries can expand trade flows. Accordingly, three types of models are to employ to explain the trade integration between all ECO, OIC, EU members and their major trading partners. The empirical results show that the three regional trade arrangements create trade and increase welfare for the participants. Another result of the study demonstrates that both rich and poor countries within those RTA's could reap the benefits of integration, even though their economic and social structures are heterogeneous and different.

**Keywords:** Economic Integration, Gravity Model, Panel Data, Fixed Effects, and Random Effects Model.

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## **1- Introduction**

Regional Trade Agreements (RTAs) continue to proliferate in the world. The General Agreement on Tariffs and Trade (GATT) received 124 notifications of RTAs in the period 1948–1994 and the World Trade Organization (WTO) estimates that over 300 will be in effect by 2007 (World Trade Organization, 2004). One of the main objectives of these agreements is to promote economic development through increases in trade. Free trade blocs have allowed countries to lower trade barriers among their neighboring countries and political allies. Changes in the trade patterns caused by a lowering of trade barriers are ultimately the mechanism by which living standards are influenced. Thus, it is very important to evaluate the relevance and desirability of multilateral free trade agreements, with an emphasis on how they affect trade flows. This paper attempts to answer the following question: European Union (EU) has been experimenting successful regional economic integration for quite a long time. Is a preferential trade agreement among OIC/ECO more or less likely to be meaningful than EU – important in intensity of impact, or beneficial, or both?

In 1957, the Treaty of Rome was signed by six European countries and this established the European Economic Community (EEC). The drive for deeper integration of European countries has continued and the Maastricht Treaty of 1991 has resulted in the transformation of the EEC to the EU. European Union (EU) is by far the oldest and most developed regional economic integration organization. The importance of regionalization has led other countries to show interests in establishing RTAs (e.g. ECO<sup>1</sup>, OIC<sup>2</sup>). The history of economic cooperation among Islamic countries is back to September 1969, when Islamic leaders gathered in Rabat to participate in first meeting of the OIC. During the meeting, foreign ministers of Islamic countries agreed the foundation of OIC's general secretariat. OIC groups 57 mostly Islamic nations to consolidate cooperation among member states in economic, social, cultural, scientific, and other fields of activity.

The Economic Cooperation Organization (ECO) is a multi governmental organization which was originally established in 1985 by Iran, Pakistan and

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1- Economic Cooperation Organization.

2- Organization of the Islamic Conference.

Turkey to allow socio-economic development of the first member states. ECO is the successor organization of what was the Regional Cooperation for Development (RCD), founded in 1962, which ended activities in 1979. In the fall of 1992, the ECO expanded to include seven new members<sup>1</sup> which provides a platform to discuss ways to improve development and promote trade, and investment opportunities. The status and power of the ECO is growing. However, the organization faces many challenges. Most importantly, the member states are seeking to form a Free Trade Area in the region. The rest of the paper is organized as follows: Section 2 presents an overview on the concept of economic integration with an emphasis on the application of gravity models of international trade flows. Section 3 specifies a gravity panel data model. Section 4 presents a comprehensive empirical application to the gravity model of an intra-EU/OIC/ECO trade. Finally, Section 5 concludes with further discussions.

## **2- The Concept of Economic Integration (Application of Gravity Models)**

Economic integration is a term used to describe how different aspects between economies are integrated. The basics of this theory were written by the Hungarian Economist Béla Balassa in the 1960's. The theory of economic integration expresses that common wealth countries make efforts to combine trade liberalization strategies with protective policies, to minimize trade restrictions amongst themselves accompanied by conducting discriminative policies for non-members. As economic integration increases, the barrier of trade between markets diminishes. In Shagi's words (1987): "economic integration relies upon economic transaction promotion and unification of resources of two or several isolated systems that leads to a rise in the capability of the larger integration system".

Economic integration comprises various stages, so that each stage is more complete than previous ones, where more obstacles are removed respect to former stages to enhance trade flows and economic co-operation amongst

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1- Afghanistan, Azerbaijan, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan.

countries (Gurler, 2000). “Preferential Trade Arrangement” (PTA) is the most primary sort of economic integration, while “Economic and Monetary Union” is the most complete version of integration. More specifically, PTA is a trading bloc which gives preferential access to certain products from certain countries. This is done by reducing tariffs, but does not abolish them completely. An example of a preferential trading area is one formed by the EU. Free Trade Area is the second stage of economic integration which is a designated group of countries that have agreed to eliminate tariffs, quotas and preferences on most goods between them. The aim of a free trade area is to so reduce barriers to easy exchange that trade can grow as a result of specialization, division of labor, and most importantly via (the theory and practice of) comparative advantage. The theory of comparative advantage argues that in an unrestricted marketplace (in equilibrium) each source of production will tend to specialize in that activity where it has comparative advantage. The theory argues that the net result will be an increase in income and ultimately wealth and well-being for everyone in the free trade area. Finally, an economic and monetary union is a single market with a common currency.

Many studies are found in the literatures that have focused particularly on the impacts of economic integration. Soloaga and Winters (1999), for instance, examine “the second wave of regionalism” that began in early 1990s and led to new *PTAs* in different blocks. They compare the results of estimated trade models before and after regionalization, namely during 1980-96, to investigate its effect on blocks’ trade flows. Martinez-Zarzoso and Nowak-Lehmann D. (2003) have an investigation on main determinants of trade flows between European Union (EU) and Mercosur members. They use a gravity-type model to study the impacts of regional trade agreements on trade flows during the 1988-96 periods. Their results indicate that potential exports for Mercosur would be predicted to increase relatively more than their real exports in 1996. In General, the gravity model of international trade flows has been widely used as a baseline model for estimating the impact of a variety of policy issues related to regional trading groups, currency unions and various trade distortions, e.g. Bougheas, Demetriades and Morgenroth (1999), De Grauwe and Skudelny (2000), Glink and Rose (2002), De Sousa and Disdier (2002), Tayyebi (2003) and Tayyebi and Bakhshi (2003). Since the seminal paper by Anderson (1979), some attempts have also been made explicitly to derive the prediction of the gravity model from

different theoretical models such as Ricardian models, Heckscher-Olin models and Increasing Returns to Scale models, e.g. Bergstrand (1989), Markusen and Wigle (1990) and Leamer (1992).

### **3- The Empirical Model**

In this paper, we use a gravity model to explore the effects of free trade agreements among EU, ECO and OIC members on volume of trade flows. Theoretically, the gravity equation has been derived through the properties of the Cobb-Douglas function. The assumption of monopolistic competition ensures this condition. In this sense, Anderson (1979) argues that a sufficient condition for obtaining a gravity equation is the assumption of perfect product specialization, which implies that each commodity is produced in just one country. The gravity model has been applied to a wide variety of goods and factors of production moving across regional and national boundaries under differing circumstances. For example, the model has been successfully applied to explain the determinants of varying types of flows, such as migration, flows of buyers to shopping centers, recreational traffic or commuting flows and patient flows to hospitals. Tinbergen (1962) and Pöyhönen (1963) were the first authors that applied the gravity equation to international trade flows.

In the context of international trade flows, the gravity model states that the size of trade flows between two countries is determined by supply conditions at the origin, demand conditions at the destination and stimulating or restraining forces related to the trade flows between the two countries (Soloaga and Winters, 1999). Core explanatory variables used to explain the volume of trade across a pair of countries are measures of economic size of trading partners and of the distance between them. Moreover, empirical works to date are often augmented by various variables such as common language, common border, free trade area and currency union membership dummies.

The traditional basic specification of the gravity model includes supply factors of the export country (population and GDP), demand factors of the import country (population and GDP), and trade supporting and impeding determinants (mostly transport costs or proxies thereof, geographical and cultural measures of bilateral proximity, etc.). According to this, exports from country  $i$  to country  $j$  are explained by their economic and demographic capacities ( $GDP$  or  $GNP$ , Population), direct geographical distances, Linder

inequality and a set of dummy variables that explain contiguity and common language effects as well as trade arrangements, etc.

The assumptions of the model are that trade flows between two countries are related positively to their *GDP*s and inversely to their geographic distance as well as Linder variable. Based on income effect proxies by *GDP*, large countries are anticipated more trade than small ones. The rich countries with larger incomes are benefiting more drastically from international trade than poor countries. Trade flows, in other hands, would be reduced by the variable of geographical distance because border closeness leads communication expends to decrease. The use of dummy variables is also considered to the model as trading partners belong to the same regional grouping such as EU, ECO and OIC. This provides means of determining what to extent, trade flows within each region is due to integration effects. Accordingly, a type of the generalized gravity model is defined as follows:

$$\begin{aligned} \text{Ln}X_{ij} = & \beta_0 + \beta_1 \text{Ln}GDP_i + \beta_2 \text{Ln}GDP_j + \beta_3 \text{Ln}POP_i + \beta_4 \text{Ln}POP_j \\ & + \beta_5 \text{Ln}Linder_{ij} + \beta_6 \text{Ln}Distance_{ij} + \beta_7 PTA_{ij} + U_{ij} \end{aligned} \quad (1)$$

Where, *Ln* denotes variables in natural logarithms,  $GDP_i$  ( $GDP_j$ ) indicates the *GDP* of exporter (importer),  $POP_i$  ( $POP_j$ ) is population of the exporter (importer).  $Distance_{ij}$  is the Geographical distance, which is measured in terms of kilometers between the centers of geographical gravity of a pair of countries.  $PTA_{ij}$  is a preferential trade dummy variable between the two countries. It takes the value of one when a certain condition is satisfied (being a member of Integrated blocks, for example), zero otherwise. Since the gravity model considers trade potential between partners, coefficients of dummy variables measures values of potential effects that are higher or lower than their actual levels. Finally,  $Linder_{ij}$  is the Linder variable, implying that the availability of structural unsimilarities of two economies can affect trade relations between countries. As unsimilarities between countries fall, trade flows should go up. In principle, the Linder variable is calculated by the following equation:

$$Linder_{ij} = \text{Ln}(GDP_i - GDP_j)^2 \quad (2)$$

Where,  $GDP_i$  ( $GDP_j$ ) is the GDP of the exporter (importer).

We expect  $\beta_1$  ( $\beta_2$ ), that indicate income elasticity of exporter (importer), to be positive. The estimating coefficient for the population of the exporters,  $\beta_3$ , may be positive or negative depending on whether the country exports less when it is big (absorption effect) or whether a big country exports more than a small country (economies of scale). The coefficient of the importer population,  $\beta_4$ , also has an ambiguous sign, for similar reasons (Martinez-Zarzoso and Nowak-Lehmann D., 2000).  $PTA_{ij}$  is a dummy variable, which is an indicator of trade integration in EU, ECO and OIC. It takes the value of one, as both the exporter and importer are members of the same block. The estimating coefficient for Linder variable is expected to be negative.

Due to the advantages of panel data over cross sections or time series data (more informative data, more variability, less co-linearity among variables and more efficiency), we have combined time series of cross sections observations. Hence, data for all countries on the preceding variables are calculated for the period 1997-2001. Thus, a panel version of regression can be defined as:

$$\text{Export}_{ijt} = \alpha_{ijt} + \sum_{k=1}^k \beta_{ijt} X_{ijt} + U_{ijt} \quad (3)$$

Where  $ij$  stands for the cross-sectional units and  $t$  for the time period.  $\alpha$  &  $\beta$  refer to the intercept and slope coefficient, respectively,  $x$  stands for the explanatory variables and  $U$  is the error term following the classical econometric assumptions. Any attempt for estimating Equation (3), which assuming intercept is homogeneous for trading partner pairs, yields biased results. That is because countries are often different in historical, cultural and political structures. It is evident that the crucial source of the bias is as a result of failure to applying Ordinary Least Squares (OLS) methods to deal with the heterogeneity among bilateral trade relationships. Accordingly, one of the solutions to control heterogeneity is the use of Panel Data procedure in which allows intercepts of the model to be specific to each trading pairs. As mentioned previously, one way to take into account the "individuality" of each two countries or each cross section unit is to let the intercept vary for each country but assume that the slope coefficients in the model are constant across countries. In the literature, this kind of model is known as the fixed effect model (FEM).

The fixed effects model can be expensive in terms of degrees of freedom if we have several cross section units. And so instead of treating intercepts as fixed, we can assume that there are random variables. This method is called error component model (ECM) or random effect model (REM). The challenge facing a researcher is to select between panel and pooling methods and if the panel approach has been selected, we should choose fixed effect or random effect model. We will implement this through  $F_{Leamer}$  test and choose between pooling and panel. There is a formal test that will help us to choose between FE or RE models, which is called Hausman test. In technical words, H statistic tests for the null hypothesis that the explanatory variables and individual effects can be uncorrelated. The FE estimates are consistent with the both null and alternative hypotheses, whereas the RE estimates are only compatible with the null hypothesis. Therefore, RE method is preferred if the null hypothesis holds, otherwise FE method can be applicable (Baltagi, 1999, Hsiao, 1986, Cheng and Wall, 1999). It should be mentioned that in the case of FEM we do not estimate directly coefficients of relevant constants of each individual (namely each trading partner pair) like geographical distance, contiguity and common languages, which do not change over time. Otherwise they would be collinear with individual effects. Therefore, in order to investigate such determinants on trade flows, we should run another regression including values of individual effects on geographical distance and some of dummy variables in which the respective equation is defined as:

$$IE_{ij} = \alpha_0 + \alpha_1 PTA_{ij} + \alpha_2 Distance_{ij} + e_i \quad (4)$$

Where,  $IE_{ij}$  stands for individual effects and  $Distance_{ij}$  denotes geographical distance between the two countries.

### **3-1- Data Resource**

To estimate the models, we have collected annual data on bilateral trade flows between EU, ECO and OIC members and all their major trading partners from (PC – TAS2001). Furthermore, the World Bank Data Base (Global Development Finance and World Development Indicators, 2001) has been used to provide us with statistics on GDP, and population. Finally data for



geographical distance have been collected from Haveman's website, available at; <http://www.eiit.org/Trade Resources/Data/Gravity>.

#### **4- Estimation Results**

In order to investigate the effects of trade integration on bilateral trade flows of EU, ECO and OIC members, we have collected annual data on exports of block members and their major trading partners. The gravity models also incorporate some macro elements such as GDP and Population. We use data available for members during the period 1997-2001 to estimate the specified gravity models. The results for each block are presented in the next three sections.

##### **4-1- Investigation of Trade Integration amongst EU Members**

Having applied Panel Data, we estimate the model, as specified in Equation 3, for 598 individuals over the period 1997-2001, totally consisting of 2990 observations. The estimation results summarized in Table 1 are based upon methods of pooling data (OLS), Fixed Effects (FE) and Random Effects (RE). According to the results obtained by the first method (pooling), all coefficients are roughly the same in their signs, values and significance. As the value of  $F_{Leamer}$ -test shows, the null hypothesis of the same individual effects cannot be acceptable, that is implying that OLS results are biased and, more specifically, there exists heterogeneity for each pair of trading partners. It means that the problem of heterogeneity should be controlled thorough concentrating on different individuals effects. Compared by the power of model fitting, the results clarify the reasons that FE and RE methods have been concerned with individual intercepts which enable us to explain heterogeneity between each pair of countries, they are thus powerful in goodness of fit rather than Pooling Data method. Estimation results arising from FE and RE procedures are shown in the third and forth columns of table 1. In addition, the Hausman statistic approves that FE results are more reliable than those obtained by RE.

**Table 1: Estimation Results for the Trade Integration Model (EU)**

<i>Explanatory Variables</i>	<i>Pooling Data</i>	<i>FE Estimates</i>	<i>RE Estimates</i>
<i>Constant</i>	-26 (-10.14)	-	11 (2.83)
<i>GDPI</i>	5.11 (10.96)	7.26 (5.89)	5.69 (26.70)
<i>GDPJ</i>	5.74 (10.72)	4.66 (5.91)	6.19 (29.83)
<i>POPI</i>	-0.98 (-1.41)	1.02 (0.53)	1.8 (1.7)
<i>POPJ</i>	-3.01 (-6.45)	-0.89 (-1.75)	0.15 (0.16)
<i>Linder</i>	-0.43 (-7.80)	-0.32 (-3.35)	-0.45 (-19.02)
<i>PTA<sub>EU</sub></i>	3481 (12.2)	4424 (10.01)	6957 (1.43)
<i>R<sup>2</sup></i>	0.28	0.50	0.45
<i>Number of Observations</i>	2990	2990	2990
<i>F<sub>LEAMER</sub></i>		8.34 (0)	
<i>Hausman -Statistic</i>		19.73 (0)	

\* Values of t-ratio are represented in parentheses. Also the probability of null hypothesis Acceptance for F-statistic and Hausman statistic is available in parentheses

Estimation results obtained by FE model (within group) indicates that GDP coefficients of both exporters and importers have the positive signs, and as expected, are statistically significant at the 99 percent confidence level. Although positive, the coefficient of exporters' population is not significant in 10 percent level. It implies that a change in the exporters' population does not affect its trade relations with the other countries, suggesting that mostly EU members export non-labor intensive goods. In contrast, the coefficient of importers' population has the negative sign and is significantly different from zero at the 10 percent significance level. According to its estimated value, it suggest that one percent increase in population of the importer leads to decrease of 0.89 percent in the volume of trade flows between two partners. Based upon the results, the importer's economy would be more inward-oriented as its population grows, that is, its demand for imports intends to decline. Being

statistically significant, dummy variable explains the impacts of trade integration on the EU's trade flows. The coefficient of  $PTA_{EU}$  explores the positive effect of integration on members' trade relations. More clearly, trade integration can increase trade between members. Finally, the coefficient of Linder variable is significant in 99 percent confidence interval plus its expected negative sign. Overall, estimation results related to FE and RE, represented in table 1, are relatively close to each other, particularly in signs and coefficient values. Because of a bit higher of  $R^2$  and also due to the H-Test, FE should be preferred.

To estimate effects of geographical distance on the volume of trade transactions between EU members and their major trading partners, we regress estimated individuals effects  $IE_{ij}$  obtained by Equation 4 on this variable. Estimation results summarized in table 2 indicate that distance coefficient is statistically significant and captured the expected correct sign. Due to the very low value of  $R^2$ , it implies that a number of cultural-social determinants are required to explain individual effects. Moreover, the results are consistent with the existence of heterogeneity between each of the trading partner pairs, involved in  $\alpha_{ij}$ , rather than distance, etc.

**Table 2: Estimates of Equation 4**

<i>Variable</i>	<i>Coefficient</i>	<i>T-Statistic</i>	<i>Prob.</i>
<i>C</i>	-53	-8.26	0.00
<i>Distance (1000 Kilometers)</i>	-0.37	-3.41	0.00
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<i>Adjusted R-squared</i>	0.03	<i>F-statistic</i>	8.20
<i>Durbin-Watson</i>	1.15	<i>Prob (F-statistic)</i>	0.00

Source: Compiled by researchers

#### **4-2- The Conduction of Trade Integration amongst ECO Members**

The second model has been estimated for 327 individuals (cross sections) during the years 1997-2001, totally consisting of 1635 observations. Table 3

presents the estimation results for the second regression. Regarding poor results obtained by OLS method and the existence of biasness for those results, as shown in the second column of Table 3, the Panel Data is again applied to enable us consider heterogeneous individual effects. The  $F_{Leamer}$ -test also confirms the aforementioned statement. Columns 3 and 4 of the table indicate estimation results obtained by both FE and RE methods. Hereby, the Hausman test assists us to find out results obtained by RE model are acceptable and more reliable while the null hypothesis of consistency for RE estimates cannot be rejected. Thus, statistically significant income elasticity coefficients explain changes positively in ECO members' trade flows by about 6.56 and 6.89 percent. The coefficient of importers' population is not significant in 10 percent level although it has its correct positive sign. It implies that a change in the importers' population does not affect its trade relations with the other countries. In other words, mostly ECO members import manufactured products and non-labor intensive goods. In contrast, the coefficient of exporters' population has the negative sign and is significant at the 10 percent level. According to its estimated value, it suggest that one percent increase in population of the exporter leads to increase of 3.89 percent in the volume of trade flows between two partners. Based upon the results, the exporter's economy would be more outward oriented as its population grows. Because of the correct sign plus significance of the coefficient of Linder variable, current structural similarities (unsimilarities) in ECO countries have affected their trade relations of the block with their trading partners. The significant coefficient of the block integration variable denoted by  $PTA_{ECO}$  ultimately justifies trade flows between members of ECO are more than the level might be predicted by quantitative gravity variables. Distance coefficient is statistically significant with the expected correct sign in RE model.

**Table 3: Estimation Results for the Trade Integration Model (ECO)**

<i>Explanatory Variables</i>	<i>Pooling Data</i>	<i>FE Estimates</i>	<i>RE Estimates</i>
<i>Constant</i>	16 (5.21)	-	14 (3.85)
<i>GDPI</i>	6.18 (37.81)	6.42 (20.42)	6.56 (36.39)
<i>GDPJ</i>	6.61 (40.4)	6.07 (27.82)	6.89 (40.56)
<i>POPI</i>	2.98 (3.01)	2.66 (1.5)	3.89 (3.55)
<i>POPJ</i>	-0.68 (-0.72)	-1.95 (-1.97)	1.03 (1.16)
<i>Linder</i>	-0.56 (-30.42)	-0.61 (-23.84)	-0.59 (-31.01)
<i>PTA<sub>ECO</sub></i>	4742 (3.05)	1889 (1.71)	5691 (3.69)
<i>Distance (1000 Kilometers)</i>	-1.37 (-18.53)	-	-1.45 (-19.25)
<i>R<sup>2</sup></i>	0.56	0.59	0.71
<i>Number of Observations</i>	1635	1635	1635
<i>F<sub>LEAMER</sub></i>	7.56 (0)		
<i>Hausman -Statistic</i>	0.64 (0.94)		

\* Values of t-ratio are represented in parentheses. Also the probability of null hypothesis Acceptance for F-statistic and Hausman statistic is available in parentheses

#### **4-3- Investigation of Trade Integration amongst OIC Members**

There are 620 cross sections (individuals) in the third regression, pooled within 5 years, totally consisting of 3100 observations. The results summarized in table 4 support the hypotheses put forward in Section 3 as far as the macro characteristics of the countries in question are concerned. Thus, the regression coefficients of the gross domestic products, populations, Linder variable,  $PTA_{OIC}$  and distance, all have the expected sign and are statistically significant in 10 percent level in the random effect model. In other words, income level of the trading partners proxied by GDP exerts a positive effect on both exporters and importers trade flows. The coefficients of population for both exporters and importers are significant in 10 percent level. The positive sign of the exporter's population implies that a change in the market size of exporters affect their trade relations with other countries. In other words, OIC members export labor-intensive products. In contrast, the coefficient of importers' population has the negative sign. According to its estimated value, it suggest that one percent

increase in population of the importer leads to decrease of 1.34 percent in the volume of trade flows between two partners. Based upon the results, the importer's economy would be more inward oriented as its population grows. An inequality in income levels captured by Linder variable has negative effects on the volume of trade flows. Subsequently to the integration process,  $PTA_{OIC}$ , which is the integrating scenario between OIC members through trade agreements, implies that decreasing tariff barriers between these countries seem to have intensified effect on their trade flows. In general, trade integration in this block facilitates a growing production specialization and a better use of scale economies. Trade liberalization, by expanding market between the nations, will lead to a rising variety of products. Finally the significant coefficient of distance variable shows that more close countries has less transportation costs and so more trade. Taken together, these gravity characteristics of the countries explain much of the variation in dependent variable, with the coefficient of determination by about 0.60 for random effect model, which stands for the explanatory power of the regression.

**Table 4: Estimation Results for the Trade Integration Model (OIC)**

<i>Explanatory Variables</i>	<i>Pooling Data</i>	<i>FE Estimates</i>	<i>RE Estimates</i>
<i>Constant</i>	-21 (-7.74)	-	-22 (-7.37)
<i>GDPI</i>	4.33 (37.92)	6.88 (31.74)	4.72 (37.82)
<i>GDPJ</i>	4.68 (40.87)	5.11 (33.90)	4.96 (41.31)
<i>POPI</i>	3.09 (3.64)	5.04 (4.54)	4.05 (4.47)
<i>POPJ</i>	-0.43 (-0.51)	-1.98 (-2.41)	-1.34 (-1.67)
<i>Linder</i>	-0.42 (-35.81)	-0.48 (-30.56)	-0.45 (-36.38)
<i>PTA<sub>OIC</sub></i>	1968 (4.66)	3286 (6.32)	2249 5.06
<i>Distance (1000 Kilometers)</i>	-0.143 (-5.02)	-	-0.184 (-6.37)
<i>R<sup>2</sup></i>	0.42	0.55	0.60
<i>Number of Observations</i>	3100	3100	3100
<i>F<sub>LEAMER</sub></i>		6.63 (0)	
<i>Hausman -Statistic</i>		0.81 (0.93)	

\* Values of t-ratio are represented in parentheses. Also the probability of null hypothesis Acceptance for F-statistic and Hausman statistic is available in parentheses

## 5- Concluding Remarks

This paper has investigated the effects of regional trade agreements on EU, ECO and OIC's trade flows, based on an application of the gravity model. Accordingly, three types of models have been employed as to the trade integration between all ECO, OIC, EU members and their major trading partners. Due to the presence of various individual effects and heterogeneity in trading-partner pairs (as individuals), the method of panel data was appropriately applied to the estimation process.

The empirical results indicate that there exists considerable trade potential among ECO/OIC and EU member states. Hence, trade integration schemes between EU, ECO, and OIC members would increase the amount of trade flows. Consequently, both rich and poor countries within those RTA's could reap the benefits of integration, even though their economic and social structures are heterogeneous and diverse.

There is evidence that trade liberalization efforts in ECO/OIC regions would have a positive impact on boosting both intra-and extra-regional trade. Regional trade agreements in ECO/OIC, in parallel with socio-economic co-operations, would aid the member states to diversify their still narrow export bases and potentially evolve new comparative advantages and complementarities that could facilitate the successful implementation of RTA's. Another point to be highlighted is that given the narrow basis of comparative advantages of ECO/OIC countries (mostly in primary goods); one can imagine that intra trade could expand especially in vertically differentiated goods.

A couple of extensions will be desirable to this research. First, it would be worth investigating the effects of RTA's on trade flows using dynamic panel data methods and see how the result of a traditional gravity model changes when country heterogeneity and dynamics are taken into account simultaneously. Secondly, it would be interesting to analyze the gravity models of international trade flows over longer time periods.

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