Econometric Analysis of the Bilateral Trade Flows in the Gulf Cooperation Council Countries

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Abstract

This study analyzes the trade flows of the Gulf Cooperation Council (GCC) both among its member countries and with the rest of the world for the 1997-2002 and 2003-2007 periods. In this paper, the research question is whether the trade flows of the GCC countries with their partners have sustained and/or they have developed new relations over time, mainly after the 2003 Customs Union agreement of the GCC. For this purpose, fixed effects models have been estimated in order to obtain individual country effects variable. Then, trade model as a function of distance and income variables and the country effects model as a function of the time invariant control variables have been estimated simultaneously within the panel analysis using the Least Squares and Generalised Method of Moments under the assumption of the presence of cross section heteroskedasticity and the robust standard errors. It has been found that: (1) The order of top fifteen trade partners has changed significantly from the EU countries and the US to the Asian countries after 2003. (2) Exports and imports of the GCC countries are related to the wealth of the partner countries, but not to their distance, mainly due to the nature of their exported and imported goods, the characteristic of the region and developments in transportation facilities.

Jel Classification: C01, C33, F14, 053

Keywords: Gulf Cooperation Council Countries, Trade Flows, Gravity model, Panel Analysis, System Estimation.

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ECONOMETRIC ANALYSIS OF THE BILATERAL TRADE FLOWS IN THE GULF COOPERATION COUNCIL COUNTRIES

1. Introduction

In 1981, six countries of the Persian Gulf; Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates formed the Gulf Cooperation Council (GCC) and signed an economic agreement aiming at implementing a free trade region, strengthening the bargaining power with external trading partners, harmonizing development plans and adopting a common oil policy, coordinating industrial policies and linking transportation networks[1]. Economic integration within the GCC has been reinforced by the formation of the Customs Union in 2003[2] and the Common Market in 2008. In addition, they agreed to introduce a single GCC currency[3] and become a monetary union by 2010[4].

GCC countries have experienced a high growth rate since 2003. The GCC was the17th largest economy in 2003, and became the 13th largest economy in the world in 2008. The economies of the GCC countries heavily depend on oil income, where hydrocarbon industries represent more than 80 percent of total government revenues, and the share of hydrocarbons in the GDP of GCC countries is about 50 percent[5]. However, in the recent years, GCC countries started to diversify their economies and gave emphasis on manufacturing, finance, transportation, education and tourism sectors. As a result of this economic diversification, non-oil sector had a higher contribution to economic growth than the oil sector during the 2003-2008 period.

This paper analyzes the bilateral trade flows of the GCC countries and attempts to develop a new model using system equations through annual panel data from 1997 to 2007. The framework of the model in this paper departs from the common (augmented) gravity model, as it estimates the trade equation with the country effect equation simultaneously. In this sense, total trade and the country effects are the endogenous variables in the model, whereas real per capita GDP of the home and partner countries, population, distance and the EU, GCC, Asia and oil producer country dummies are the explanatory variables.

There are three contributions of this paper: (1) Examination of bilateral trade flows of each GCC country with its partners, individually, for two different sample periods. (2) Consideration of country effects produced by the fixed effects models and country ranking for the trade partners for each GCC country. (3) Development of a gravity model specification where bilateral trade flows and country effects are determined endogenously for each GCC country. This analysis provides the

[1] http://www.worldtradelaw.net/fta/agreements/gccfta.pdf

[2] The GCC customs union eliminated all tariff and non-tariff barriers among the member countries and set the common external tariffs at three levels; 5% tariff rate applies to most products, some agricultural and medical products have zero tariffs, and a number of restricted or protected products have selected higher tariff rates.

[3] With the exception of Oman, that dropped out of monetary union plans in 2006.

[4] Recently, the deadline for the adoption of the common currency has been extended to a date to be determined by the monetary council.

[5] Mohieldin, M., "Point of View: Neighborly Investments", *Finance & Development*, December 2008, Vol. 45, No.4

following outcomes: (1) Fixed effect panel models provide information on individual country effects. Country ranking approach reveals that the overall order of countries has not changed, but the order of the first fifteen partners has changed significantly from 1997-2002 to 2003-2007 period with regard to the data used for each GCC country. (2) The GCC countries have increased their trade activities and the standard of living after 2003. (3) Contrary to the common gravity equation for trade, the coefficient of the distance variable is commonly insignificant in the model, mainly due to the nature of the traded goods of the region.

The paper starts with an economic review of the GCC countries and evaluates the trade patterns of the member countries. The modified gravity model for the GCC trade, econometric methodology and estimation results are presented in the Section 3. Section 4 concludes the estimation results.

2. International Trade Pattern of the GCC countries

The GCC has a relatively small but an increasing share in world trade. As seen in Table 1, the share of the region in the world exports has reached 4.68 percent, where it was around 2 percent in the late 1990s. The share the GCC merchandise imports in world imports has also increased in recent years.

Table 1: Share of the GCC Merchandise Trade in the World Trade (%)

	1997	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**
Exports	2.38	1.75	2.07	2.73	2.59	2.59	2.80	3.09	3.79	3.97	4.00	4.68
Imports	1.46	1.48	1.32	1.27	1.39	1.47	1.49	1.61	1.73	1.81	2.05	2.24

Source: WTO International Trade Statistics, 2009

The GCC countries are also characterized with their highly open trade regimes and their dependence on exports and imports. The share of merchandise trade in the GDP of the GCC countries is around 100 percent, except for Kuwait and Saudi Arabia. These shares are impressive and among the highest worldwide, as the share of merchandise trade in the GDP is 45 percent in the OECD countries, 67 percent in the Euro area, and 60 percent in the whole Middle East and North Africa (MENA) region. As shown in Tables 2, 3 and 4, Bahrain and the UAE have the most open economies among the GCC countries and their economies are highly dependent both on exports and imports.

Table 2: Exports of the GCC countries (% of GDP)

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Bahrain	132	111	122	136	125	127	126	133	146	144	-
Kuwait	74	70	66	71	69	64	66	69	75	72	74
Oman	81	80	77	83	85	86	85	89	89	91	-
Qatar	79	82	78	84	83	78	78	78	84	96	-
Saudi Arabia	54	47	49	57	54	56	61	69	76	79	85
UAE	146	137	124	120	125	126	135	157	152	150	-

Source: World Bank WDI Database

Table 3: Exports of the GCC countries (% of GDP)

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Bahrain	79	65	79	89	82	82	82	92	100	99	-
Kuwait	53	44	46	56	51	45	52	57	64	65	65
Oman	50	42	49	59	57	58	57	57	63	63	-
Qatar	48	51	60	67	66	60	62	64	68	58	-
Saudi Arabia	39	30	35	44	40	41	46	53	61	63	65
UAE	83	73	70	73	73	73	79	90	93	91	-

Source: World Bank WDI Database

Table 4: Imports of the GCC countries (% of GDP)

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Bahrain	70	64	63	64	60	66	64	73	76	73	-
Kuwait	40	51	39	30	36	37	34	32	28	24	30
Oman	39	50	38	31	36	37	38	43	36	38	-
Qatar	36	40	26	22	29	28	28	28	33	37	-
Saudi Arabia	26	27	23	25	24	24	24	26	28	32	38
UAE	74	75	65	55	61	64	65	76	71	68	-

Source: World Bank WDI Database

GCC trade is concentrated on high-income countries, such as Japan, South Korea, the US, and the EU[6]. The merchandise imports of the GCC countries from these countries are mainly capital and technology intensive goods; machinery and transport equipment, such as power generation plants, railway locomotives and aircraft, and manufactured goods from the EU, aerospace products and parts, automobiles, various machinery, engines, turbines and power transmission equipment from the US, automobiles and auto parts from Japan, and automobiles, various machinery, engines, iron and ships from South Korea. Also, with an increasing volume in the last decade, the GCC countries import manufactured goods and various machinery from China and India[7]. On the other hand, GCC exports to these trade partners are heavily dominated by oil and oil products.

However intra-GCC trade and trade with neighbouring countries are limited. The main reason of this is the fact that the countries of the region are similar in certain aspects, they rely heavily on the oil sector and have the highest concentrations in terms of sector contribution to GDP when compared to developed countries[8]. In this respect, economic diversification is important for the GCC region for further intra-regional trade through diversified economies[9]. In the recent years, the goal of decreasing vulnerability of the economies to the fluctuations in the oil and gas prices, high population growth and rising unemployment in the region increased the need for economic diversification. Significant amount of investment has been directed to services -especially to finance, tourism, transport, telecommunication and education-, construction and manufacturing sectors.

Albeit relatively low in trade volume, the GCC countries have a strong relationship with the rest of the Islamic countries due to common cultural and religious values, and economic interests, like

[6] Currently, the EU and the GCC are negotiating a free trade agreement (FTA), aiming at a coordination and divergence not only in trade and investment related issues, but also in areas like human rights, terrorism and illegal immigration.
[7] China and India have an energy cooperation with the GCC and they challenge to the US energy interest in the region.
[8] Abouchakra et al. (2008)
[9] Sturm et al. (2008)

being the members of OPEC and coordinating policies in oil markets. The economic relations with other Islamic countries also include labour movements, where the GCC countries receive a significant amount of labour force from Pakistan, Egypt and Indonesia[10]. Egypt, Jordan and Pakistan have improved their economic relations with the GCC countries and they depend more on the GCC for remittances[11]. In the recent years, the outflow of foreign direct investment from the GCC countries to other Islamic countries also increased significantly in services, real estate, infrastructure development, steel, shipping and energy sectors.

3. A Modified Gravity Model of the GCC Trade

The basic gravity model based on Newton's gravity equation states that the volume of trade between two countries is directly related to the product of their incomes, but inversely related to the distance between these countries. The first application of gravity models to empirical international trade analysis was pioneered by Tingerben (1962) and then continued by Linnemann (1966) and many other scholars. Afterwards, other explanatory variables have been added to the model as the measures of size of economies, geographical positions, cultural proximities, religion, and economic and regional trading arrangements.

There have been numerous panel data gravity models that explain the potential international trade flows between trading partners. Frankel (1997) provided the most comprehensive work on the trade theory and estimation techniques concerning the gravity model of bilateral trade. Bun and Klaassen (2003) emphasized the importance of dynamics in panel gravity models of trade flows and used ARDL(1,1) dynamic panel structure to describe short run dynamics including time specific constants and treating country effects as fixed. They indicated that the LSDV estimates give better results than the GMM estimates. Zarzoso and Lehman (2003) estimated a gravity model on the trade potentials between Mercosur and the EU, where they found that fixed effects model (FEM) is superior to random effects model (REM) in explaining bilateral trade flows as they included more variables than the standard gravity model. Benedictis and Vicarelli (2004) underlined that robustness of a common panel functional form depends upon the choice of static or dynamic specification. They used generalised method of moments (GMM) to estimate export flows. Baier and Bergstrand (2004) analysed the effects of free trade agreements and evaluated the potential economic benefits of these agreements between the EU and the GCC countries. Ramos and Zarzoso (2005) argued that there appear some differences between rich and poor countries in gravity models and showed that trade flows are more sensitive to geographical and cultural variables for developing countries than for developed countries. Boughanmi (2008) studied the trade potential of GCC countries with a panel fixed effect gravity model. The paper aimed to investigate the import flows of the GCC countries with 69 partners over the period of 1990 to 2004 and found that the income variables and the dummy

[10] There is also a high ratio of immigration flow from India to the GCC.
[11] *Middle East and Central Asia*, Regional Economic Outlook, World Economic and Financial Surveys, IMF, May 2009.

variable for the GCC countries are positive and significant supporting a high volume of intra-trade, but the EU and the US dummies are negative and significant, which indicates a low level of integration.

3.1 Econometric Methodology

This paper analyzes the bilateral trade flows of each GCC country and attempts to develop a new approach to the gravity model by estimating bilateral trade flows in system equations with annual panel data from 1997 to 2007. Annual trade data is drawn from the UN-COMTRADE database and the income data is drawn from IMF International Finance Statistics (IFS). All the variables, except for the dummies, are in natural log form.

The modelling framework departs from the common gravity model, as the trade equation and the country effect equation have been estimated simultaneously. In this sense, the total trade flows and the country effects are the endogenous variables in the model, whereas per capita real GDP of the home and partner countries, population, distance and dummies are the exogenous variables. Real total trade is defined in US dollars based on 2000 prices. In the analysis, first, GDP based on the purchasing power parity has been used to facilitate the cross country comparisons. However, the purchasing power parity[12] (PPP) method directly reflects relative price of consumer and investment goods in different countries and also decreases the disparity in GDP between high and low income (GDP) countries. For that reason, the use of the PPP based income has caused measurement errors, as stated by Frankel (1997; 59). Therefore, the PPP based GDP has been replaced by real per capita GDP in US dollars based on 2000 prices.

The log of real per capita income measures the wealth or life standard of a country, such that if the income coefficient is significantly positive and greater than one, then an increase in the wealth of the host or the partner country raises the country's propensity to trade further.

Population is a proxy for the size of economy, thus the coefficient on the log of population is expected to be positive. In addition, the coefficient on population can capture the trend in the medium term and can explain the size and self-sufficiency of the partner countries according to the economies of scale and motivation of trade. In this analysis, trade partner's population has been included in the country effects equation as an explanatory variable, whereas the GCC country population has been used as the instrument[13] in the GMM estimations in order to avoid the multicollinearity and autocorrelation problems.

Distance is the difference between capital cities and measured in kilometres. It is generally accepted as a proxy for transport costs, with a negative sign. Dummy variables are the GCC dummy, the EU-15 dummy, other oil producer countries dummy and ASIA dummy. The coefficient on each

[12] OECD (2005), New GDP Comparisons Based on Purchasing Power Parities for the Year 2002.
[13] This variable with the first lagged values of trade and income, and the dummy variables are used as the instruments of the GMM model.

dummy variable reflects the major group effects on trade. Finally, the first lagged value of trade flow verifies the dynamic pattern of trade, stability of system and the robustness of the models.

The estimation approach of this paper includes two steps: (1) Fixed effect trade models have been estimated in order to obtain unobservable partner country heterogeneity[14] on trade for each GCC country, and then the trading partners have been ranked according to size of the estimated country effect coefficients for each GCC country. (2) Modified gravity models have been estimated through the system equations in order to evaluate the impact of each variable on bilateral trade for each GCC country. Accordingly, in this analysis:

(1) Fixed effects trade models have been estimated by the OLS through 1997-2002 and 2003-2007 in order to control observed and unobserved characteristics of individual country effects by the following equation:

$$LT\_GCC_{it} = \phi_0 + \phi_1 LPCI\_GCC_{it} + \phi_3 LPCI\_TP_{jt} + \omega_t$$

(2) Validity of the fixed effects have been tested by the F and Hausman tests.

(3) Individual country effects variable has been defined for each of the GCC countries and these effects are assumed to be fixed during the estimation period.

(4) Individual country effects variable has been used to calculate country ranking and the Spearman's rank correlation coefficients.

(5) Correlation coefficients have been calculated between (i) the domestic country income and the FEM residuals, (ii) the partner country income and the FEM residuals, (iii) the local country income and the individual country effects, (iv) the partner country income and the country effects, and (v) the country effects and the FEM residuals to ensure the correct specification.

(6) Static and dynamic trade models, for each country, have been estimated with the country effects equation simulataneously over the periods 1997-2002 and 2003-2007 by OLS and GMM methods.

$$LRT\_GCC_{it} = \alpha_0 + \alpha_1 LCE\_GCC_{it} + \alpha_2 LPCRI\_GCC_{it} + \alpha_3 LPCRI\_TP_{jt} + \alpha_4 LDIST + u_{1t}$$

$$LRT\_GCC_{it} = \beta_0 + \beta_1 LCE\_GCC_{it} + \beta_2 LPCRI\_GCC_{it} + \beta_3 LPCRI\_TP_{jt} + \beta_4 LDIST + \beta_5 LRT\_GCC_{it-1} + u_{2t}$$

$$LCE\_GCC_i = \theta_0 + \theta_1 EUDUM_i + \theta_2 GCCDUM_i + \theta_3 NONOPDUM_i + \theta_4 ASIADUM_i + \theta_5 LPOP\_TP_j + \varepsilon$$

(7) Panel unit root tests have been applied to the residuals obtained from the estimated trade equation.

Each modified gravity model is based on the single country panel data approach, taking into account country specific intercept in international trade. For that reason, in the first step, the individual country effects for each GCC country have been captured by the fixed effect trade equation as a function of income variables since the FEM cannot covariate with the invariant variables. Invariant variables cause collinearity with the fixed effects in the single equation specification[15]. In the second step, the trade and country effects equations have been estimated simultaneously for each GCC country.

[14] It is called as the "individual country effect" throughout the paper. It is assumed that the intercept term differs from country to country, but it is constant over time.

[15] Zarzoso and Lehmann (2003) also suggest a two step estimation technique.

It is believed that panel residual unit root tests help to distinguish a well specified model from a misspecified model. Since the error term on an econometric model varies with the structure of the model and the estimation method, the stationarity of the error term ensures that the linear combination of the variables is stationary. For these purposes the Im, Pesaran and Shin- and the Levin, Lin and Chu-t panel unit root tests[16] with individual fixed effects and trend effects have been applied to estimated residuals.

3.2 Discussion on Estimated Results

The variables in this analysis have been assumed to encompass relevant information in the bilateral trade flows of the GCC countries with their trade partners. The research question of this paper is that whether the GCC countries have sustained their trade partnerships and/or they have developed new trade relations after the 2003 Customs Union agreement. The primary concern of this analysis is to find a suitable econometric model for a given time dimension and data so that model selection depends mainly on the statistical/econometric properties of the series given the number of observations and the research question.

The first step of this analysis has started by the estimation of fixed effect models (FEM) by OLS in order to obtain the observed and unobserved characteristics of individual countries on bilateral trade. The selection of trade partners from different continents with different language, religion, political, and development levels depends on the availability and reliability of data; whereas the selection of the estimation periods is determined in line with the GCC economic integration process. The six GCC members implemented a Customs Union in January 2003, eliminating all tariffs on trade and freeing movements of goods throughout the GCC.

The test[17] results statistically support the FEM. The LS estimators are consistent as long as the error term in the fixed effects model is uncorrelated with the explanatory variables, supporting exogeneity of these variables. Table A1 presents the correlation coefficients and supports the exogeneity of income variables over the two estimation periods facilitating the use of OLS estimators[18]. Additionally, since there is a correlation between the trade partner's income and the country effect, then the FEM with cross section weights is the appropriate model. Furthermore, if the country effect is absorbed into the error term, then the error is correlated with the country effect. It has been found that all correlation coefficients are zero and the results favour the FEM for all countries.

Table B1 illustrates the Spearman's rank correlation coefficients in order to compare the position of trading partners between two set of data over the 1997-2002 and 2003-2007 periods. The

[16] The IPS test assumes that under the null hypothesis each series contains a unit root against at least one of the individual series is stationary. The LLC test assumes that under the null hypothesis the persistence parameters are common across cross sections against all series are stationary.

[17] The redundant fixed effects (F) test and the correlated random effects (Hausman χ^2) test. It is known that if there is a heterogeneity bias, then the LS estimators are inconsistent.

[18] If the fixed effects are constant over time or across countries, their effects are absorbed into the intercept, and hence these estimates will be unbiased and efficient.

overall results support a strong positive correlation exhibiting that the trade partners are roughly in the same order for each GCC country. However, for each GCC member, the composition of the top 15 partner countries changes noticeably after 2003. Asian countries China, India, Japan, S. Korea, Pakistan and Thailand; the EU countries the UK and Germany; the US; the GCC members Saudi Arabia and the United Arab Emirates have become important trade partners in all GCC trade.

The country rankings for each of GCC countries are presented in Table B2, and they provide information for the following results:

(1) **Bahrain:** The UAE is the most important trade partner in both periods. Saudi Arabia has become the second trading partner after 2003. Other GCC countries take place around first 25 in the rank. There are eight Asian countries among the first fifteen trade partners, namely India, China, Pakistan, Japan, Thailand, South Korea, Indonesia, and Malaysia. Kenya is above the US, the UK, and Germany. Iran is also the main trading partner. Russia and Mexico place the last position in the rank.

(2) **Kuwait**: India has become the most important trading partner of Kuwait after 2003. The UAE has moved to the second position in the rank after 2003. There are seven Asian countries among the first fifteen partners, namely India, S. Korea, China, Japan, Indonesia, Singapore, and Thailand. The US has a position above Saudi Arabia, but below China and Japan. The UK, Germany and France have moved down in the rank after 2003. Israel gets the last position in the rank during the both periods.

(3) **Oman**: The UAE is at top of the list after 2003. Seven Asian countries, specifically China, Thailand, India, S. Korea, Japan, Malaysia, and Pakistan, have become important partners following the UAE after 2003. Saudi Arabia takes a place below the Asian countries, but above the US, the UK and Germany. Other GCC countries get lower places in the rank. Both South Africa and Italy have become important trade partners. Australia has lost its position after 2003. Algeria and Israel share the last positions in the rank during 1997-2002 and 2003-2007 periods respectively.

(4) **Qatar**: The UAE is the first and Japan is the second in the rank in both periods. India and S. Korea take the third and fourth positions in the rank, while Thailand, China, Singapore and Saudi Arabia keep their positions after 2003. Other GCC members get lower positions in the rank. The US and the UK go down, whereas Spain moves up in the rank after 2003. Slovakia and Israel have the weakest trade relationship in 1997-2002 and 2003-2007 periods respectively.

(5) **Saudi Arabia**: China is the leading trade partner, while the United Arab Emirates and the US have a strong trade links after 2003. Eight Asian countries, i.e. India, Japan, S. Korea, Pakistan, Thailand, Indonesia, Philippines, and Singapore, are at the top of the rank mainly after 2003. Bahrain, Kuwait, Oman, and Qatar do not maintain a significant place in the country ranking in the post-2003 period. South Africa and Jordan have moved to a higher position, whereas the

UK, France, Netherlands, and Spain as the EU members could not keep their position after 2003. Israel holds the weakest trade relationship among the examined trade partners.

(6) **United Arab Emirates:** Japan has become the most important trade partner during both periods. India has moved up and become the second trading partner after 2003. The US has come into ranking after China and S. Korea, but on top of Saudi Arabia. Iran has a higher rank than the EU member countries Germany, France, and Italy. Oman is among the top fifteen trade partners as a GCC member, but the other GCC members take lower orders in the rank. Israel is the last one in the rank for the both periods.

In the second step of the analysis, for each GCC country, the bilateral trade equation has been determined by the host and partner countries' real per capita incomes, individual country effects[19] and distance variables with a constant term, whereas the country effect equation has been defined in terms of dummies and the partner countries' population. That is, while the country effects are allowed to vary from one country to another as a function of the specific time invariant variables, the slope coefficients are assumed to be constant within country and time dimension. Accordingly, the bilateral trade flows and the individual country effects equations have been estimated simultaneously by OLS[20] and GMM within the modified gravity model assuming that $\theta_1=1$[21].

Individual country estimation results have been reported in Appendix C[22] in Tables C1 to C6. The first lagged of dependent variable has been added to the behavioural trade equation when OLS is used, whereas it has been used as an instrument where GMM is used. Since the fixed effects model is less sensitive to violation of the strict exogeneity assumption, lag variable is expected to reduce correlation and also to capture the dynamics of trade. The static and dynamic OLS results are reported in first and second columns, and the static model GMM results are reported in third column. The OLS estimates of the static and dynamic trade equations for each GCC are similar supporting the robustness of OLS results. The coefficient on the lagged trade variable is always less than one and insignificant for some countries, confirming the stability of each equation. The GMM estimates are similar to the OLS estimates for all GCC, except for the coefficient on other oil producer countries dummy. A comparison of the estimation results allows us to conclude that all model specifications are better through the 2003 and 2007 period. This is also confirmed by the residuals panel unit root tests[23] in Appendix D.

[19] Individual country effect is the cross section term obtained from the FEM, and assumed to be constant and specific to the individual country over the estimation periods.
[20] OLS results are identical to the WLS results.
[21] The effects of the EU, GCC, other oil producer countries, ASIA dummies and the population of the trade partner on bilateral trade flows are allowed to occur through the country effect variable in the trade equation.
[22] The estimated intercept term in the trade equation for each GCC country is not statistically significant from 2003 to 2007 period, except Qatar; but it is significant during the 1997-2002 period for KUW, OMA, QAT, SAU, and UAE where the OLS is used. These results are not reported.
[23] Since Im-Pesaran-Shin (IPS) test has a better performance in finite samples and the Levin-Lin-Chu (LLC) test has a better performance for the unbalanced panels, both tests have been used to test for common and individual unit roots under the null hypotheses. Lag selection is based on SIC.

For a comparative country analysis, it would be better to examine the static estimation and compare the role of each variable in the two estimation periods. The role of real per capita income in determining bilateral trade is a critical issue in view of the economies of scale and motivation of trade. The model analyses the effects of the real per capita incomes of both the GCC countries and the trade partners on their trade patterns. The OLS and GMM coefficients of the real per capita income of the GCC countries are significant and positive in both periods however the values have increased in the second period. In the 1997-2002 period, only Bahrain and Saudi Arabia have coefficient values more than one, but in the 2003-2007 period, the coefficient of the domestic real per capita income exceed one in all GCC countries. This implies that, increases in the wealth of the GCC countries have been reflected to trade of these countries in proportionally higher values. Over the last five years, for every GCC country, an increase in the per capita income has created a multiplier effect on trade.[24] As the GCC countries got wealthier, their demand for high-valued and capital intensive imported goods like machinery, mechanical appliances and automobiles increase, and this directly led to the increases in imports. This result is also consistent with the economic fact that richer countries tend to trade more than poor ones.

The estimated coefficients on the real per capita income of trade partner countries display a slightly different trend. Except for Bahrain and Qatar, the impact of the increases in the real per capita incomes of the trade partners is relatively low, even negative in some countries for the first period. In the second period, on the other hand, the coefficient values increase significantly to positive values. Interestingly, while Bahrain had the highest coefficient value on the trade partner's per capita income level in the first period, the coefficient value almost halved in the second period. Positive coefficient values imply that trade volumes of the GCC countries rise as their trade partners' income increase. Still, this rise in trade is proportionately lower than the increase in the partner's income, as the estimated values are less than one. This is mainly the result of the relatively inelastic demand structure of oil. Oil demand from the GCC countries is not affected by the income fluctuations noticeably since the global oil demand has been driven mainly by growth in emerging countries including the non-GCC oil producers and the GCC members. This intuition is also validated in Table 12, where the lowest coefficient values of the partner's real per capita income is in two large oil producers, Saudi Arabia and the UAE.

Contrary to the common gravity equation for trade, the coefficient of the distance variable is commonly insignificant in all periods and for all countries. One reason of this insignificancy is the type of traded goods and the geographical location of the GCC countries. The GCC is surrounded by either relatively low-income countries or countries that have oil reserves. The GCC countries mainly export oil, fuels, gas, lubricants, energy intensive products such as petrochemicals and aluminium to relatively rich countries like the EU, Japan, South Korea, and the US where low transport costs give

[24] 2003–2007 period includes the golden years for the GCC due to favourable conditions such as the rise in oil prices, huge investment projects for economic diversification and the strong global equity market.

GCC producers some competitive advantage[25]. Moreover, the GCC countries import high-tech and manufactured products like machinery and mechanical appliances, vehicles, electrical machinery and equipment. Since these are not produced in the neighbouring countries, they are imported both from developed countries, such as the US, Japan, the EU and S. Korea, and developing countries with low labour costs, like China, India, Thailand, Malaysia, and Pakistan. Second reason is related with the measurement method of geographical distance, since most of exports and imports are realized by shipments as a result of technological progress in sea transport facilities. Currently, the cost of transport is related to the transport infrastructure rather than distance. Third reason is the inclusion of the GCC dummy which is highly correlated with the distance variable and thus it acts as an adjacency variable in the system. Fourth reason is the sufficiently deep bilateral trade agreements and arrangements with the GCC countries which are represented by the Asia and EU dummies. These effects weaken the role of distance on trade. Finally, a hypothetical reason[26] might be the impact of migration flows to the GCC economies which are positively and significantly linked to the trade flows reducing the role of distance. Consequently, in this context, it is not surprising to obtain an insignificant coefficient on distance variable since technological developments in production, communication and transportation facilities have made transport easier, leaving distance variable as an inefficient proxy for transport cost in the gravity model.

The estimated coefficients on the GCC, EU and Asia dummies are generally highly significant revealing the importance of regional or block effects on bilateral trade. Even though the GCC dummies for all GCC members are significant and positive in both periods, the coefficient values are lower in the second period (except for Saudi Arabia) revealing that the GCC customs union has not proceeded as expected. The EU dummy is not significant for Bahrain, but it is highly significant for the other members after 2003. Noticeably, the decrease in the magnitudes of the coefficients after 2003 validates the compressed role of the EU countries in the GCC trade flows. The coefficient on the other oil producer countries dummy variable is insignificant for Kuwait, Oman and Saudi Arabia; negative for Bahrain and Qatar, but positive for the UAE throughout the first period. In the second period, it becomes insignificant only for Saudi Arabia, is still positive for the UAE, and negative for the other countries. The reason of the positive coefficient for the UAE is that the UAE imports oil from non-GCC oil producer countries, mainly from Iran and re-export to other countries. Asian dummies appear very high and significant for all the GCC countries supporting their strong trade connection in both periods. This is mainly due to the fact that four of the top ten oil importers, Japan, China, South Korea and India are in the Asia region and they extensively export from the GCC countries. These results are consistent with the country ranking approach in Appendix A.

[25] J. Rollo, Prospects for an EU-Gulf Cooperation Council Free Trade Area, The World's First Region to Region FTA, Briefing Paper, Chatham House and University of Sussex, April 2008.

[26] The author has been examining the trade and migration relationship within another work, and believes in the existence of a strong relationship between them. It is known that there is an immigration flow from Asian countries (mainly from India and Pakistan) to the GCC countries.

Coefficients on the partner country population are always less than one and positive, having a positive effect on the GCC trade. The coefficient is higher in the second period, with the exception of Bahrain. This is also an expected outcome in view of the oil based trade structure of the GCC countries where every increase in the population of the trade partner accompanies with a rise in the demand for energy.

4. Conclusion

In this paper, the research question is whether the trade flows of each GCC country with their partners have sustained or have developed new relations mainly after the 2003 Customs Union agreement of the GCC. The research approach is different than other gravity model studies. Usual gravity models include highly correlated (multicollinearity) proximities, such as distance, population and dummies. So a single country gravity equation cannot be estimated with the time invariant variables within the fixed effect model. In this study, the application of simultaneous estimation method has been found rather convenient with regard to the trade and country effects equations using annual panel data. The gravity model as a function of distance and income variables; the country effects model as a function of dummies and the partners' populations have been estimated for each GCC country. The individual country effects variable has been obtained from the fixed effect trade model, defined as a function of domestic and foreign incomes. Two equations system has been estimated separately for each GCC over two sample periods by the Least Squares and Generalised Method of Moments under the assumption of the presence of cross section heteroskedasticity and the robust standard errors.

The results of the estimated models for the periods 1997-2002 and 2003-2007 reveal some important facts regarding the trade patterns of the GCC countries. First of all, distance variable, the key determinant of the gravity model, is insignificant for all GCC countries. On the other hand, incomes and time invariant variables are the important determinants of trade flows in this analysis.

Overall, this empirical analysis provides three important outcomes:

(1) Fixed effect panel models provide information on individual country effects. Country ranking approach makes the trade destination of each GCC country known. The results reveal that the overall rank of trade partners has not changed significantly from 1997-2002 to 2003-2007 period. However, the order of top fifteen trade partners has changed significantly as Asian countries have moved above the EU countries and the US after 2003.

(2) The trade flows of the GCC countries are positively related to the trade partner's per capita income, as expected from a gravity model specification. Accordingly, with the global economic growth in the last decade, until the recent economic crisis, the GCC countries notably increased their trade activities and the standard of living.

(3) The model shows that, contrary to the core of the gravity model where trade between two countries decreases as distance between them increases, the trade pattern of the GCC countries show a different trend. Exports and imports of the GCC countries are related to the wealth of the partner countries, but not to their distance, mainly due to the nature of their exported and imported goods, the characteristic of the region and developments in transportation facilities.

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APPENDICES

Abbreviations and Definitions:

FEM: Fixed effects model

BAHR: Bahrain
KUW: Kuwait
OMA: Oman
QAT: Qatar
SAU: Saudi Arabia
UAE: United Arab Emirates

GCC_i :Gulf Cooperation Council, i=BAHR, KUW, OMA, QAT, SAU, UAE

LCE_i: Natural log of individual country effect obtained from the related FEM.
LRT: Natural of log of Real Total Trade (constant in 2000=100 US$)
LPCRI: Natural log of Per Capita Real GDP (constant in 2000=100 US$)
$LDIST_i$: Natural log of Distance between Capital Cities.
LPOP: Natural log of Population

TP_j: Trade Partner,
j=1,..,56 for BAHR;
j=1,..,61 for KUW;
j=1,..,57 for OMA;
j=1,...61 for QAT;
j=1,..,65 for SAU;
j=1,..,67 for UAE.

List of the Partner Countries:

BAH	Partner	KUW	Partner	OMA	Partner
1	Algeria	1	Algeria	1	Algeria
2	Argentina	2	Argentina	2	Argentina
3	Australia	3	Australia	3	Australia
4	Austria	4	Austria	4	Austria
5	Belg/Lux.	5	Bahrain	5	Bahrain
6	Brazil	6	Belg/Lux.	6	Belg/Lux
7	Canada	7	Bulgaria	7	Brazil
8	Chile	8	Canada	8	Canada
9	China	9	Chile	9	Chile
10	Cyprus	10	China	10	China
11	Czech Rep	11	Cyprus	11	Cyprus
12	Denmark	12	Czech	12	Czech
13	Egypt	13	Denmark	13	Denmark
14	Finland	14	Egypt	14	Egypt
15	France	15	Finland	15	Finland
16	Germany	16	France	16	France
17	Greece	17	Germany	17	Germany
18	Hong Kong	18	Greece	18	Greece
19	Hungary	19	Guatemala	19	Hong Kong
20	India	20	Hong Kong	20	Hungary
21	Indonesia	21	Hungary	21	India
22	Iran	22	India	22	Indonesia
23	Ireland	23	Indonesia	23	Iran
24	Italy	24	Iran	24	Ireland
25	Japan	25	Ireland	25	Israel
26	Jordan	26	Israel	26	Italy
27	Kenya	27	Italy	27	Japan
28	Kuwait	28	Japan	28	Jordan
29	Lebanon	29	Jordan	29	Kenya
30	Malaysia	30	Kenya	30	Kuwait
31	Mexico	31	Lebanon	31	Lebanon
32	Morocco	32	Malaysia	32	Malaysia
33	Netherlands	33	Malta	33	Mexico
34	New Zealand	34	Mexico	34	Morocco
35	Norway	35	Morocco	35	Netherlands
36	Oman	36	Netherlands	36	N. Zealand
37	Pakistan	37	N. Zealand	37	Norway
38	Philippines	38	Norway	38	Pakistan
39	Poland	39	Oman	39	Portugal
40	Portugal	40	Pakistan	40	Qatar
41	Qatar	41	Philippines	41	Romania
42	Romania	42	Poland	42	Russia
43	Russia	43	Portugal	43	S. Korea
44	S. Korea	44	Qatar	44	S. Arabia
45	Saudi Arabia	45	Romania	45	Singapore
46	South Africa	46	Russia	46	Slovakia
47	Spain	47	S. Korea	47	S. Africa
48	Sweden	48	S.Arabia	48	Spain
49	Switzerland	49	Singapore	49	Sweden
50	Syria	50	Slovakia	50	Swiss
51	Thailand	51	S. Africa	51	Tanz
52	Tunisia	52	Spain	52	Thailand
53	Turkey	53	Sweden	53	Tunisia
54	UAE	54	Swiss	54	Turkey
55	UK	55	Syria	55	UAE
56	USA	56	Thailand	56	UK
		57	Tunisia	57	USA
		58	Turkey		
		59	UAE		
		60	UK		
		61	USA		

QAT	Partner	SAU	Partner	UAE	Partner
1	Algeria	1	Algeria	1	Algeria
2	Argentina	2	Argentina	2	Argentina
3	Australia	3	Australia	3	Australia
4	Austria	4	Austria	4	Austria
5	Bahrain	5	Bahrain	5	Bahrain
6	Belg/Lux	6	Belg/Lux	6	Belg/Lux
7	Brazil	7	Brazil	7	Brazil
8	Canada	8	Bulgaria	8	Bulgaria
9	Chile	9	Canada	9	Canada
10	China	10	Chile	10	Chile
11	Cyprus	11	China	11	China
12	Czech Rep	12	Columbia	12	Cyprus
13	Denmark	13	Czech	13	Czech
14	Egypt	14	Denmark	14	Denmark
15	Ethiopia	15	Egypt	15	Egypt
16	Finland	16	Ethiopia	16	Ethiopia
17	France	17	Finland	17	Finland
18	Germany	18	France	18	France
19	Greece	19	Germany	19	Germany
20	Hong Kong	20	Ghana	20	Ghana
21	Hungary	21	Greece	21	Greece
22	India	22	Guatemala	22	Hong Kong
23	Indonesia	23	Hong Kong	23	Hungary
24	Iran	24	Hungary	24	India
25	Ireland	25	India	25	Indonesia
26	Israel	26	Indonesia	26	Iran
27	Italy	27	Iran	27	Ireland
28	Japan	28	Ireland	28	Israel
29	Jordan	29	Israel	29	Italy
30	Kenya	30	Italy	30	Japan
31	Kuwait	31	Japan	31	Jordan
32	Malaysia	32	Jordan	32	Kenya
33	Mexico	33	Kenya	33	Kuwait
34	Morocco	34	Kuwait	34	Lebanon
35	Netherlands	35	Lebanon	35	Malaysia
36	New Zealand	36	Malaysia	36	Malta
37	Norway	37	Mauritius	37	Mauritius
38	Oman	38	Mexico	38	Mexico
39	Pakistan	39	Morocco	39	Morocco
40	Philippines	40	Netherlands	40	Netherlands
41	Poland	41	N. Zealand	41	N.Zealand
42	Portugal	42	Norway	42	Norway
43	Romania	43	Oman	43	Oman
44	Russia	44	Pakistan	44	Pakistan
45	S. Korea	45	Philippines	45	Philippines
46	S. Arabia	46	Poland	46	Poland
47	Singapore	47	Portugal	47	Portugal
48	Slovakia	48	Qatar	48	Qatar
49	S. Africa	49	Romania	49	Romania
50	Spain	50	Russia	50	Russia
51	Sudan	51	S. Korea	51	S. Korea
52	Sweden	52	Singapore	52	S. Arabia
53	Switzerland	53	S. Africa	53	Singapore
54	Syria	54	Spain	54	Slovakia
55	Tanzania	55	Sudan	55	Slovenia
56	Thailand	56	Sweden	56	S. Africa
57	Tunisia	57	Swiss	57	Spain
58	Turkey	58	Syria	58	Sweden
59	UAE	59	Tanz	59	Swiss
60	UK	60	Thailand	60	Syria
61	USA	61	Tunisia	61	Tanz
		62	Turkey	62	Thailand
		63	UAE	63	Tunisia
		64	UK	64	Turkey
		65	USA	65	Uganda
				66	UK
				67	USA

$EUDUM_i$: Takes 1 if the partner is the Members of EU, otherwise 0.

15 EU Members:

Austria
Belgium/Luxemburg
Denmark
Finland
France
Germany
Greece
Ireland
Italy
Netherlands
Portugal
Spain
Sweden
UK

$GCCDUM_i$: Takes 1 if the partner is the member of GCC;, otherwise 0.

$ASIADUM_i$, Takes 1 if the partner is the Asian country; otherwise 0.

Asian Countries:

China
Indonesia
Hong Kong
India
Japan
S. Korea
Malaysia
Pakistan
Philippines
Thailand
Singapore

$NONOPDUM_j$: Takes 1 if the partner is the (non-GCC) oil producer; otherwise 0.

Top 20 World Oil Producers:

Algeria	Mexico
Brazil	Norway
Canada	Russia
Iran	US

(Except Saudi Arabia, UAE, Kuwait, Oman, and UK, China, and Indonesia)

APPENDIX-A

Table A1: Correlation Coefficients

	1997-2002		2003-2007	
	FEM residual	LCE	FEM residual	LCE
LPCRI_GCC				
BAHR	0.051	0.000	0.058	-0.013
KUW	0.012	0.010	0.029	-0.011
OMA	0.038	-0.006	0.061	-0.003
QAT	-0.002	0.002	-0.003	0.034
SAU	-0.013	0.008	0.007	-0.005
UAE	0.015	-0.003	0.002	-0.007
LPCRI_TP				
BAHR	0.005	-0.454	0.006	-0.311
KUW	0.000	0.171	0.004	-0.245
OMA	0.000	0.238	0.008	-0.328
QAT	-0.002	-0.081	0.001	-0.214
SAU	-0.001	0.242	0.001	-0.174
UAE	-0.003	0.342	-0.008	0.053
LCE				
BAHR	0.000		0.000	
KUW	0.000		0.000	
OMA	0.000		0.000	
QAT	0.000		0.000	
SAU	0.000		0.000	
UAE	0.000		0.000	

APPENDIX B

Table B1: Spearman's Country Rank Correlation Coefficients: (1997-2002) & (2003-2007)

Country	Number of trade partners	Coefficient
Bahrain	56	0.928
Kuwait	61	0.884
Oman	57	0.971
Qatar	61	0.960
Saudi Arabia	65	0.906
United Arab Emirates	67	0.931

Table B2: Country Ranking

BAHRAIN			
1997-2002	COUNTRY	2003-2007	COUNTRY
1	UAE	1	UAE
2	India	2	Saudi Arabia
3	Pakistan	3	India
4	Saudi Arabia	4	China
5	China	5	Kenya
6	Kenya	6	USA
7	Indonesia	7	Pakistan
8	Thailand	8	Japan
9	USA	9	Thailand
10	S. Korea	10	S. Korea
11	Japan	11	UK
12	Malaysia	12	Germany
13	UK	13	Indonesia
14	Iran	14	Malaysia
15	Brazil	15	Iran

KUWAIT			
1997-2002	COUNTRY	2003-2007	COUNTRY
1	Japan	1	India
2	USA	2	UAE
3	S. Korea	3	Pakistan
4	Singapore	4	S. Korea
5	Netherlands	5	China
6	UK	6	Japan
7	Germany	7	Indonesia
8	Pakistan	8	USA
9	India	9	Singapore
10	France	10	Netherlands
11	Saudi Arabia	11	Egypt
12	Italy	12	Saudi Arabia
13	Indonesia	13	UK
14	China	14	Thailand
15	UAE	15	Germany

OMAN			
1997-2002	COUNTRY	2003-2007	COUNTRY
1	Japan	1	UAE
2	UAE	2	China
3	S. Korea	3	Thailand
4	China	4	India
5	Thailand	5	S. Korea
6	USA	6	Japan
7	UK	7	Malaysia
8	Singapore	8	Pakistan
9	Saudi Arabia	9	Saudi Arabia
10	Germany	10	USA
11	Italy	11	UK
12	France	12	Germany
13	Malaysia	13	Singapore
14	India	14	South Africa
15	Australia	15	Italy

QATAR			
1997-2002	COUNTRY	2003-2007	COUNTRY
1	UAE	1	UAE
2	Japan	2	Japan
3	S. Korea	3	India
4	India	4	S. Korea
5	Thailand	5	Thailand
6	China	6	China
7	Singapore	7	Singapore
8	USA	8	Pakistan
9	Saudi Arabia	9	Saudi Arabia
10	Philippines	10	France
11	Pakistan	11	USA
12	UK	12	Spain
13	France	13	Philippines
14	Indonesia	14	Germany
15	Germany	15	UK

SAUDI ARABIA			
1997-2002	COUNTRY	2003-2007	COUNTRY
1	USA	1	China
2	Japan	2	UAE
3	S. Korea	3	USA
4	Singapore	4	India
5	UK	5	Japan
6	France	6	S. Korea
7	China	7	Pakistan
8	Italy	8	Thailand
9	Germany	9	Indonesia
10	India	10	Philippines
11	Netherlands	11	Singapore
12	UAE	12	South Africa
13	Indonesia	13	Italy
14	Spain	14	Jordan
15	Pakistan	15	Germany

UNITED ARAB EMIRATES			
1997-2002	COUNRTY	2003-2007	COUNRTY
1	Japan	1	Japan
2	S. Korea	2	India
3	USA	3	China
4	UK	4	S. Korea
5	Singapore	5	USA
6	Germany	6	Thailand
7	France	7	UK
8	Oman	8	Saudi Arabia
9	Italy	9	Iran
10	Hong Kong	10	Germany
11	India	11	Pakistan
12	Saudi Arabia	12	Singapore
13	China	13	France
14	Thailand	14	Oman
15	Iran	15	Italy

APPENDIX-C

Table C1: BAHRAIN

1997-2002:	**OLS**		**GMM**
Dependent variable: LRT_BAHR	**(1)**	**(2)**	
LCE	1.000 [0.013]	1.017 (0.054)	1.016 [0.015]
LPCRI_BAHR	1.207 [0.376]	1.251 (0.382)	1.378 [0.550]
LPCRI_TP	0.811 [0.020]	0.825 (0.047)	0.823 [0.019]
LDIST	**0.000 [0.027]**	**0.008 (0.029)**	**-0.001 [0.037]**
LRT_BAHR_{t-1}		**-0.016 (0.052)**	
Dependent variable: LCE_BAHR			
EUDUM	**-0.076 [0.185]**	**-0.076 [0.185]**	**0.064 [0.156]**
GCCDUM	2.949 [0.267]	2.949 [0.267]	3.124 [0.208]
NONOPDUM	-1.255 [0.234]	-1.255 [0.234]	**-0.283 [0.292]**
ASIADUM	1.187 [0.232]	1.187 [0.232]	1.052 [0.177]
LPOP_TP	0.743 [0.054]	0.743 [0.054]	0.874 [0.039]
N	667	661	652
$\bar{R}_1^2$	0.943	0.943	0.943
$\bar{R}_2^2$	0.578	0.578	0.542
SER_1	0.439	0.441	0.441
SER_2	1.287	1.287	1.352
Mean of LRT_BAHR	17.115	17.104	17.104
Mean of LCE_BAHR	0.011	0.011	0.000
2003-2007:	**OLS**		**GMM**
Dependent variable: LRT_BAHR	**(1)**	**(2)**	
LCE	1.000 [0.016]	0.842 (0.061)	1.003 [0.016]
LPCRI_BAHR	1.539 [0.178]	1.351 (0.192)	1.397 [0.192]
LPCRI_TP	0.458 [0.019]	0.383 (0.034)	0.458 [0.019]
LDIST	**-0.000 [0.009]**	**-0.005 (0.028)**	**-0.008 [1.916]**
LRT_BAHR_{t-1}		0.154 (0.058)	
Dependent variable: LCE_BAHR			
EUDUM	**0.326 [0.177]**	**0.326 [0.177]**	0.413 [0.158]
GCCDUM	2.862 [0.255]	2.862 [0.255]	2.878 [0.185]
NONOPDUM	-0.894 [0.225]	-0.894 [0.225]	**-0.109 [0.262]**
ASIADUM	0.895 [0.222]	0.895 [0.222]	1.074 [0.191]
LPOP_TP	0.650 [0.051]	0.650 [0.051]	0.688 [0.031]
N	556	555	553
$\bar{R}_1^2$	0.937	0.939	0.938
$\bar{R}_2^2$	0.567	0.568	0.539
SER_1	0.427	0.423	0.428
SER_2	1.129	1.129	1.170
Mean of LRT_BAHR	17.619	17.620	17.620
Mean of LCE_BAHR	0.013	0.013	0.015

GMM Instruments: $LPCRI\_BAHR_{t-1}$, $LPRINC\_TP_{t-1}$, $LTRADE\_BAHR_{t-1}$, LPOP_TP, LPOP_BAHR, GCCDUM, EUDUM, ASIADUM, NONOPDUM, CONSTANT.

Country effects for each periods obtained from the related fixed effects models.
Standard errors are in brackets and parentheses.
Bold variables are insignificant

Table C2: KUWAIT

1997-2002:	**OLS**		**GMM**
Dependent variable: LRT_KUW	**(1)**	**(2)**	
LCE	0.999 [0.013]	0.703 (0.538)	1.006 [0.015]
LPCRI_KUW	0.986 [0.257]	0.752 (0.246)	0.932 [2.603]
LPCRI_TP	- 0.061 [0.021]	-0.046 (0.020)	-0.073 [0.022]
LDIST	**0.000 [0.034]**	**-0.003 (0.033)**	**0.000 [0.036]**
LRT_KUW_{t-1}		0.293 (0.052)	
Dependent variable: LCE_KUW			
EUDUM	2.175 [0.214]	2.175 [0.214]	2.137 [0.182]
GCCDUM	2.665 [0.314]	2.665 [0.314]	2.482 [0.178]
NONOPDUM	**0.076 [0.234]**	**0.076 [0.234]**	-0.439 [0.317]
ASIADUM	2.655 [0.257]	2.655 [0.257]	2.684 [0.257]
LPOP_TP	0.479 [0.057]	0.479 [0.057]	0.347 [0.174]
N	728	722	713
$\bar{R}_1^2$	0.943	0.948	0.943
$\bar{R}_2^2$	0.496	0.496	0.496
SER_1	0.531	0.500	0.522
SER_2	1.553	1.553	1.552
Mean of LRT_KUW	17.849	17.886	17.886
Mean of LCE_KUW	- 0.014	-0.014	0.017

2003-2007:	**OLS**		**GMM**
Dependent variable: LRT_KUW	**(1)**	**(2)**	
LCE	1.000 [0.013]	0.997 (0.052)	0.999 [0.014]
LPCRI_KUW	1.615 [0.153]	1.598 (0.174)	1.488 [0.147]
LPCRI_TP	0.514 [0.020]	0.513 (0.034)	0.515 [0.016]
LDIST	**-0.000 [0.033]**	**0.003 (0.033)**	**-0.005 [0.042]**
LRT_KUW_{t-1}		**0.293 (0.052)**	
Dependent variable: LCE_KUW			
EUDUM	1.028 [0.213]	1.028 [0.213]	0.655 [0.173]
GCCDUM	2.152 [0.312]	2.152 [0.312]	1.788 [0.189]
NONOPDUM	-0.859 [0.285]	-0.859 [0.285]	-1.491 [0.305]
ASIADUM	2.236 [0.255]	2.236 [0.255]	1.862 [0.245]
LPOP_TP	0.650 [0.051]	0.650 [0.051]	0.703 [0.043]
N	604	603	601
$\bar{R}_1^2$	0.955	0.955	0.955
$\bar{R}_2^2$	0.589	0.589	0.578
SER_1	0.469	0.470	0.469
SER_2	1.410	1.411	1.434
Mean of LRT_KUW	18.654	18.650	18.650
Mean of LCE_KUW	0.021	0.021	0.018

GMM Instruments: $LPCRI\_KUW_{t-1}$, $LPRINC\_TP_{t-1}$, $LTRADE\_KUW_{t-1}$, LPOP_TP, LPOP_KUW, GCCDUM, EUDUM, ASIADUM, NONOPDUM, CONSTANT.

Country effects for each periods obtained from the related fixed effects models.
Standard errors are in brackets and parentheses.
Bold variables are insignificant

Table C3: OMAN

1997-2002:	**OLS**		**GMM**
Dependent variable: LRT_OMA	**(1)**	**(2)**	
LCE	1.000 [0.011]	0.723 (0.051)	1.003 [0.012]
LPCRI_OMA	0.713 [0.318]	0.579 (0.307)	2.959 [0.606]
LPCRI_TP	-0.063 [0.021]	-0.053 (0.020)	-0.071 [0.018]
LDIST	**-0.000 [0.038]**	**-0.007 (0.037)**	**0.000 [0.031]**
LRT_OMA_{t-1}		0.271 (0.050)	
Dependent variable: LCE_OMA			
EUDUM	2.128 [0.231]	2.128 [0.231]	2.773 [0.203]
GCCDUM	3.659 [0.334]	3.659 [0.334]	3.958 [0.210]
NONOPDUM	**-0.416 [0.293]**	**-0.416 [0.293**	-0.454 [0.313]
ASIADUM	3.293 [0.280]	3.293 [0.280]	4.052 [0.257]
LPOP_TP	0.405 [0.062]	0.405 [0.062]	0.376 [0.050]
N	684	681	678
$\bar{R}_1^2$	0.958	0.961	0.952
$\bar{R}_2^2$	0.520	0.520	0.500
SER_1	0.487	0.467	0.522
SER_2	1.618	1.618	1.657
Mean of LRT_OMA	16.979	16.992	6.992
Mean of LCE_OMA	0.000	0.000	0.009
2003-2007:	**OLS**		**GMM**
Dependent variable: LRT_OMA	**(1)**	**(2)**	
LCE	1.000 [0.011]	0.805 (0.054)	1.004 [0.009]
LPCRI_OMA	1.468 [0.136]	1.273 (0.144)	1.327 [0.146]
LPCRI_TP	0.668 [0.017]	0.535 (0.400)	0.672 [0.015]
LDIST	**-0.000 [0.033]**	**-0.003 (0.032)**	**-0.000 [0.042]**
LRT_OMA_{t-1}		0.193 (0.053)	
Dependent variable: LCE_OMA			
EUDUM	0.506 [0.181]	0.506 [0.181]	0.473 [0.144]
GCCDUM	3.075 [0.262]	3.075 [0.262]	3.045 [0.255]
NONOPDUM	-1.157 [0.230]	-1.157 [0.230]	-1.228 [0.219]
ASIADUM	2.314 [0.223]	2.314 [0.223]	2.508 [0.225]
LPOP_TP	0.850 [0.049]	0.850 [0.049]	0.856 [0.042]
N	565	564	562
$\bar{R}_1^2$	0.969	0.971	0.968
$\bar{R}_2^2$	0.724	0.723	0.717
SER_1	0.383	0.375	0.384
SER_2	1.162	1.162	1.179
Mean of LRT_OMA	17.755	17.760	17.760
Mean of LCE_OMA	- 0.012	-0.012	-0.003

GMM Instruments: $LPCRI\_OMA_{t-1}$, $LPRINC\_TP_{t-1}$, $LTRADE\_OMA_{t-1}$, LPOP_TP, LPOP_OMA, GCCDUM, EUDUM, ASIADUM, NONOPDUM, CONSTANT.

Country effects for each periods obtained from the related fixed effects models.
Standard errors are in brackets and parentheses.
Bold variables are insignificant

Table C4: QATAR

1997-2002:	**OLS**		**GMM**
Dependent variable: LRT_QAT	**(1)**	**(2)**	
LCE	1.000 [0.014]	0.743 (0.045)	0.992 [0.016]
LPCRI_QAT	0.575 [0.215]	0.495 (0.204)	0.739 [0.606]
LPCRI_TP	0.570 [0.022]	0.411 (0.033)	0.548 [0.022]
LDIST	**-0.000 [0.038]**	**-0.005 (0.038)**	**0.010 [0.021]**
LRT_QAT_{t-1}		0.259 (0.042)	
Dependent variable: LCE_QAT			
EUDUM	0.916 [0.221]	0.916 [0.221]	1.037 [0.190]
GCCDUM	3.457 [0.326]	3.457 [0.326]	3.451 [0.214]
NONOPDUM	-1.072 [0.280]	-1.072 [0.280]	**-0.098 [0.332]**
ASIADUM	2.527 [0.259]	2.527 [0.259]	2.166 [0.239]
LPOP_TP	0.727 [0.063]	0.727 [0.063]	0.807 [0.059]
N	719	709	691
$\bar{R}_1^2$	0.938	0.947	0.941
$\bar{R}_2^2$	0.541	0.541	0.512
SER_1	0.612	0.568	0.601
SER_2	1.597	1.597	1.617
Mean of LRT_QAT	16.773	16.791	16.991
Mean of LCE_QAT	- 0.043	-0.043	- 0.003
2003-2007:	**OLS**		**GMM**
Dependent variable: LRT_QAT	**(1)**	**(2)**	
LCE	0.999 [0.013]	0.910 (0.054)	1.002 [0.012]
LPCRI_QAT	1.452 [0.099]	1.317 (0.127)	1.532 [0.099]
LPCRI_TP	0.567 [0.019]	0.516 (0.036)	0.572 [0.018]
LDIST	**0.000 [0.031]**	**0.001 (0.031)**	**-0.001 [0.022]**
LRT_QAT_{t-1}		**0.086 (0.051)**	
Dependent variable: LCE_QAT			
EUDUM	0.858 [0.186]	0.858 [0.186]	0.962 [0.158]
GCCDUM	2.957 [0.273]	2.957 [0.273]	3.119 [0.172]
NONOPDUM	-0.776 [0.235]	-0.776 [0.235]	-0.617 [0.228]
ASIADUM	2.133 [0.217]	2.133 [0.217]	1.662 [0.255]
LPOP_TP	0.753 [0.052]	0.753 [0.052]	0.881 [0.049]
N	609	609	609
$\bar{R}_1^2$	0.950	0.951	0.951
$\bar{R}_2^2$	0.635	0.635	0.621
SER_1	0.474	0.472	0.475
SER_2	1.229	1.229	1.254
Mean of LRT_QAT	18.020	18.020	18.020
Mean of LCE_QAT	0.003	0.002	0.003

GMM Instruments: $LPCRI\_QAT_{t-1}$, $LPRINC\_TP_{t-1}$, $LTRADE\_QAT_{t-1}$, LPOP_TP, LPOP_QAT, GCCDUM, EUDUM, ASIADUM, NONOPDUM, CONSTANT.

Country effects for each periods obtained from the related fixed effects models.
Standard errors are in brackets and parentheses.
Bold variables are insignificant

Table C5: SAUDI ARABIA

1997-2002:	**OLS**		**GMM**
Dependent variable: LRT_SAU	**(1)**	**(2)**	
LCE	1.000 [0.009]	0.846 (0.054)	0.997 [0.012]
LPCRI_SAU	1.284 [0.284]	1.417 (0.291)	-3.179 [3.318]
LPCRI_TP	0.091 [0.011]	0.075 (0.013)	0.091 [0.014]
LDIST	**0.000 [0.021]**	**-0.002 (0.022)**	**-0.014 [0.043]**
LRT_SAU_{t-1}		0.152 (0.052)	
Dependent variable: LCE_SAU			
EUDUM	1.889 [0.176]	1.889 [0.176]	1.617 [0.129]
GCCDUM	1.836 [0.273]	1.836 [0.273]	1.465 [0.198]
NONOPDUM	**0.262 [0.225]**	**0.262 [0.225]**	-0.677 [0.232]
ASIADUM	1.924 [0.198]	1.924 [0.198]	1.450 [0.184]
LPOP_TP	0.482 [0.051]	0.482 [0.051]	0.430 [0.043]
N	770	761	745
$\bar{R}_1^2$	0.969	0.969	0.947
$\bar{R}_2^2$	0.466	0.466	0.436
SER_1	0.319	0.319	0.413
SER_2	1.315	1.315	1.296
Mean of LRT_SAU	19.755	19.773	19.773
Mean of LCE_SAU	- 0.050	-0.050	0.019

2003-2007:	**OLS**		**GMM**
Dependent variable: LRT_SAU	**(1)**	**(2)**	
LCE	1.000 [0.007]	0.961 (0.049)	1.008 [0.010]
LPCRI_SAU	1.532 [0.106]	1.479 (0.132)	1.588 [0.113]
LPCRI_TP	0.433 [0.010]	0.416 (0.024)	0.433 [0.010]
LDIST	**-0.000 [0.018]**	**-0.003 (0.018)**	**-0.001 [0.030]**
LRT_SAU_{t-1}		**0.039 (0.049)**	
Dependent variable: LCE_SAU			
EUDUM	1.004 [0.199]	1.004 [0.199]	0.503 [0.147]
GCCDUM	2.041 [0.303]	2.041 [0.303]	1.653 [0.256]
NONOPDUM	**-0.371 [0.252]**	**-0.371 [0.252]**	-1.171 [0.210]
ASIADUM	1.606 [0.221]	1.606 [0.221]	1.081 [0.195]
LPOP_TP	0.717 [0.056]	0.717 [0.056]	0.696 [0.049]
N	645	644	642
$\bar{R}_1^2$	0.981	0.981	0.981
$\bar{R}_2^2$	0.504	0.504	0.471
SER_1	0.267	0.267	0.268
SER_2	1.351	1.351	1.399
Mean of LRT_SAU	20.358	20.360	20.360
Mean of LCE_SAU	-0.007	-0.007	-0.005

GMM Instruments: $LPCRI\_SAU_{t-1}$, $LPRINC\_TP_{t-1}$, $LTRADE\_SAU_{t-1}$, LPOP_TP, LPOP_SAU, GCCDUM, EUDUM, ASIADUM, NONOPDUM, CONSTANT.

Country effects for each periods obtained from the related fixed effects models.
Standard errors are in brackets and parentheses.
Bold variables are insignificant

Table C6: UNITED ARAB EMIRATES

1997-2002:	**OLS**		**GMM**
Dependent variable: LRT_UAE	**(1)**	**(2)**	
LCE	1.000 [0.008]	0.794 (0.044)	1.006 [0.014]
LPCRI_UAE	0.941 [0.170]	0.888 (0.168)	4.473 [0.659]
LPCRI_TP	-0.226 [0.011]	-0.185 (0.015)	-0.229 [0.016]
LDIST	**-0.000 [0.021]**	**-0.001 (0.020)**	**-0.016 [0.021]**
LRT_UAE_{t-1}		0.205 (0.043)	
Dependent variable: LCE_UAE			
EUDUM	2.214 [0.192]	2.214 [0.192]	2.377 [0.163]
GCCDUM	3.195 [0.293]	3.195 [0.293]	3.009 [0.144]
NONOPDUM	1.308 [0.227]	1.308 [0.227]	1.214 [0.233]
ASIADUM	2.367 [0.228]	2.367 [0.228]	2.604 [0.272]
LPOP_TP	0.319 [0.050]	0.319 [0.050]	0.213 [0.043]
N	798	790	779
$\bar{R}_1^2$	0.972	0.974	0.943
$\bar{R}_2^2$	0.477	0.477	0.463
SER_1	0.319	0.310	0.461
SER_2	1.429	1.429	1.454
Mean of LRT_UAE	19.240	19.249	19.249
Mean of LCE_UAE	- 0.007	-0.007	0.008
2003-2007:	**OLS**		**GMM**
Dependent variable: LRT_UAE	**(1)**	**(2)**	
LCE	0.999 [0.010]	0.752 (0.056)	0.995 [0.014]
LPCRI_UAE	2.005 [0.117]	1.468 (0.167)	1.863 [0.119]
LPCRI_TP	0.122 [0.012]	0.091 (0.014)	0.125 [0.011]
LDIST	**0.000 [0.023]**	**-0.000 (0.022)**	**0.056 [0.066]**
LRT_UAE_{t-1}		0.244 (0.054)	
Dependent variable: LCE_UAE			
EUDUM	1.216 [0.184]	1.216 [0.184]	1.345 [0.148]
GCCDUM	2.779 [0.284]	2.779 [0.284]	2.629 [0.140]
NONOPDUM	0.436 [0.216]	0.436 [0.216]	**0.373 [0.242]**
ASIADUM	1.710 [0.218]	1.710 [0.218]	2.213 [0.245]
LPOP_TP	0.506 [0.048]	0.506 [0.048]	0.431 [0.041]
N	664	663	661
$\bar{R}_1^2$	0.969	0.971	0.968
$\bar{R}_2^2$	0.494	0.494	0.479
SER_1	0.322	0.314	0.326
SER_2	1.253	1.253	1.276
Mean of LRT_UAE	20.134	20.136	20.136
Mean of LCE_UAE	0.002	0.002	0.006

GMM Instruments: $LPCRI\_UAE_{t-1}$, $LPRINC\_TP_{t-1}$, $LTRADE\_UAE_{t-1}$, LPOP_TP, LPOP_UAE, GCCDUM, EUDUM, ASIADUM, NONOPDUM, CONSTANT.

Country effects for each periods obtained from the related fixed effects models.
Standard errors are in brackets and parentheses.
Bold variables are insignificant

APPENDIX-D

Table D1: Trade Equation-Residuals Panel Unit Root Tests

IPS W-test: H_0: individual unit root process		Individual Effects & Individual Linear Trends		Individual Effects & Individual Linear Trends	
		OLS		**GMM**	
COUNTRY	**Specification**	**1997-2002**	**2003-2007**	**1997-2002**	**2003-2007**
Bahrain	Static	**0.262 (0.603)**	-1.631 (0.051)	**0.221 (0.587)**	-1.912 (0.028)
	Dynamic	**0.401 (0.656)**	-1.633 (0.051)		
Kuwait	Static	**-0.150 (0.440)**	-8.461 (0.00)	**0.142 (0.556)**	-6.656 (0.00)
	Dynamic	**-0.597 (0275)**	-8.125 (0.00)		
Oman	Static	**-0.975 (0.165)**	-13.741 (0.00)	**-0.762 (0.223)**	-7.208 (0.00)
	Dynamic	-1.332 (0.091)	-3.430 (0.00)		
Qatar	Static	**0.908 (0.818)**	-4.812 (0.00)	**1.244 (0.893)**	-4.949 (0.00)
	Dynamic	-1.906 (0.028)	-14.558 (0.00)		
Saudi Arabia	Static	**0.606 (0.728)**	-29.884 (0.00)	**-0.220 (0.413)**	**-0.560 (0.288)**
	Dynamic	**-0.163 (0.435)**	-4.547 (0.00)		
UAE	Static	**0.092 (0.537)**	-1.893 (0.029)	**-0.024 (0.490)**	-1.440 (0.075)
	Dynamic	**-0.146 (0.442)**	-4.387 (0.00)		

The test statistics in the first rows of the OLS and the GMM columns are for the static system equations, whereas in the second rows of the OLS columns are for the dynamic system equations.
Probability values are in parentheses.
Bold values show the acceptance of the unit root processes at the 5 and 10% significance levels.

Table D2: Trade Equation-Residuals Panel Unit Root Tests

LLC t-test: H_0: common unit root process		Individual Effects & Individual Linear Trends		Individual Effects & Individual Linear Trends	
		OLS		**GMM**	
COUNTRY	**Specification**	**1997-2002**	**2003-2007**	**1997-2002**	**2003-2007**
Bahrain	Static	-17.73 (0.00)	-16.14 (0.00)	-16.59 (0.00)	-15.97 (0.00)
	Dynamic	-15.05 (0.00)	-38.94 (0.00)		
Kuwait	Static	-28.13 (0.00)	-46.19 (0.00)	-23.89 (0.00)	-47.89 (0.00)
	Dynamic	-37.19 (0.00)	-51.68 (0.00)		
Oman	Static	-34.05 (0.00)	-349.8 (0.00)	-32.76 (0.00)	-170.5 (0.00)
	Dynamic	-41.50 (0.00)	-72.93 (0.00)		
Qatar	Static	-18.82 (0.00)	-61.27 (0.00)	-15.49 (0.00)	-68.44 (0.00)
	Dynamic	-39.49 (0.00)	-104.8 (0.00)		
Saudi Arabia	Static	-21.45 (0.00)	-60.66 (0.00)	-26.01 (0.00)	-1.278 (0.10)
	Dynamic	-29.36 (0.00)	-33.57 (0.00)		
UAE	Static	-14.37 (0.00)	-30.67 (0.00)	-24.83 (0.00)	-33.18 (0.00)
	Dynamic	-23.70 (0.00)	-32.75 (0.00)		

The test statistics in the first rows of the OLS and the GMM columns are for the static system equations, whereas in the second rows of the OLS columns are for the dynamic system equations.
Probability values are in parentheses.
Bold values show the acceptance of the unit root processes at the 5 and 10% significance levels.