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Modelling The Trade Flows of The Gulf Cooperation Council Countries: A New Approach to Gravity Model

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September 2009

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MODELLING THE TRADE FLOWS OF THE GULF COOPERATION COUNCIL COUNTRIES: A NEW APPROACH TO GRAVITY MODEL

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September 2009

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 by employing a panel data gravity model in the context of the single country approach in order to capture the impacts of observable and unobservable variables on the bilateral trade flows for the 1997-2002 and 2003-2007 periods. In this paper, the research question is whether the trade flows of each GCC countries with its partners have sustained and/or they have developed new relations over time, mainly after 2003 custom 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- with the country effects model- as a function of the time invariant control variables- have been estimated simultaneously within the panel data 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. There are three contributions of this paper: (1) Examination of bilateral trade flows for each GCC country over the two different sample periods. (2) Country ranking for each GCC country over the two different sample periods. (3) Simultaneous gravity model specification for each GCC country over the two different sample periods.

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

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1. Introduction

In May 1981 the Gulf Cooperation Council (GCC) countries, Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates signed an agreement with the motivation to strengthen the defence of the Arab Gulf region. The GCC countries signed Economic Agreement in June 1981 and the objectives were specified in the United Economic Agreement in November 1981. The economic objectives of this agreement were specified as implementing a free trade region with no barriers on regional products and common tariffs on imported goods, strengthening the bargaining power with external trading partners, harmonizing development plans and adopting a common oil policy, coordinating industrial policies and adopting a common legal framework for regional trade and investment, and linking transportation networks. A limited progress has been made until December 2001. Since then, the share of intra-regional trade in the GCC has increased in the region. In 2003, they have established a custom union, where all tariff and non-tariff barriers among the member countries have been eliminated and a common external tariff rate has been set at 5 percent level¹. In addition, they have agreed to introduce a single GCC currency by 2010.

The GCC countries have experienced a high growth rate from 2003 to 2008. The GCC was the 17th largest economy in 2003, and became the 13th largest economy in the world in 2008. Non oil sector had a higher contribution to economic growth than oil sector during the 2003-2008 period. The contribution of the non-oil sector is the result of economic diversification. The GCC countries gave emphasis on manufacturing, finance, transportation, education and tourism sectors. Despite increasing diversification, hydrocarbon industries still represent more than 80 percent of total government revenues, and the share of hydrocarbons in the GDP of GCC countries has risen from 36 percent in 2002 to about 50 percent in 2007². Recently, the GCC partnerships with foreign companies have moved them beyond their traditional areas.

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,

¹ The GCC customs union sets the external tariffs at three levels; 5 percent 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.

² IMF, Finance and Development, December, 2008.

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 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 data used for each GCC country. (2) The GCC countries have increased their trade activities and the standard of living after 2003. (3) There is evidence that gravity model is not the proper specification for the GCC trade relations because of the insensitivity of distance to trade.

Next section of this 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 Section 3. Section 4 concludes the estimation results.

2. Economic Review of the GCC countries

During the 1970s and 1980s, Gulf investments were mainly concentrated in the real estate sector and activities associated with the hydrocarbon sector. The upward trend in the oil prices strengthened the fiscal and current account surpluses and the foreign exchange reserves of the GCC countries. However, 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 diversification. Since the capital intensive oil and gas industry offers only limited employment opportunities (Sturm et al., 2008: 14), industrial policies towards diversification have focused on different sectors in different GCC countries. Large current account surpluses with investments by corporations and wealthy individuals have allowed a significant portion of GCC investments to take place through Gulf-based sovereign wealth

funds³ (SWF). The GCC sovereign funds are diversified on global equities, hedge funds, real estate, and private equity⁴. In Saudi Arabia, significant amount of investment has been directed to service sectors- especially to finance, telecommunication and education- and to construction sectors. Bahrain, on the other hand, has allocated its resources to the financial services sector and established itself as a financial hub for the Gulf region and for the Arab world. Services sectors like tourism and transport has also shown significant development in the recent years in Bahrain. Qatar has focused its investments on natural gas industry, which is not considered as a solution for the volatile prices in the world energy markets. Oman is still concentrated on oil revenues, despite some efforts to develop manufacturing and tourism industries. Kuwait is highly dependent on oil and recently develop finance sector. Finally the UAE, the country with the most diversified economy in the region, has significantly developed tourism, finance and transport industries. Especially the tourism sector has become one of the main sectors of the UAE economy in terms of revenue generating. However, despite recent efforts on diversification, the GCC countries -with the exception of the UAE and Bahrain- still rely on the oil sector. As Abouchakra et al. (2008) shows, the GCC countries have the highest concentrations in terms of sector contribution to GDP when compared to developed countries.

From a global view, the GCC has a relatively small but increasing share in world trade as seen in Table 1. The share of the region in the world exports has approached to 4 percent recently, where it was around 2 percent in the late 1990s. The share of 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 |
|-------------|------|------|------|------|------|------|------|------|------|------|------|
| Exports (%) | 2.38 | 1.79 | 2.07 | 2.73 | 2.59 | 2.59 | 2.80 | 3.09 | 3.79 | 3.97 | 3.94 |
| Imports (%) | 1.46 | 1.48 | 1.32 | 1.27 | 1.39 | 1.47 | 1.49 | 1.61 | 1.74 | 1.80 | 2.07 |

Source: WTO Trade Reports

The GCC countries are also characterized with their highly open and liberal trade regimes, where the share of total external trade to GDP is around 100 percent, except for Kuwait and Saudi Arabia. As shown in Tables 2, 3 and 4, Bahrain and the UAE have more open economies and they export about the same value of their GDPs. The country with the least open trade regime in the GCC is Kuwait, with an export share in GDP at 65 percent and an import share in GDP at only 30 percent.

³ A sovereign wealth fund (SWF) is a state-owned investment fund composed of financial assets such as stocks, bonds, property, precious metals or other financial instruments. The SWF includes stabilization funds, classical investment funds, and private-equity style government companies. These funds have allowed domestic financial sectors to develop.

⁴ Detailed information is given by B. Setser and R. Ziemba, *GCC Sovereign Funds Reversal of Fortune*, Working paper, Council on Foreign Relations, Center for Geoeconomic Studies, January 2009.

Table.2: Merchandise trade of the GCC economies (% 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 | 71 | 77 |
| 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

Table.3: Exports of the GCC economies (% 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

Table.4: Imports of the GCC economies (% 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

Table 5 shows that GCC trade is concentrated on the high-income countries, such as Japan, South Korea, the US, and the EU. These countries are followed by the Asian countries; China, India, Pakistan, and Thailand. However intra-GCC trade and trade with neighbouring countries are limited. In this respect, economic diversification is important for the GCC region for further intra-regional trade through diversified economies. Intra-trade patterns of the GCC countries⁵ differ from each other; Oman and Kuwait has the highest share of exports and imports from the GCC; Bahrain and Qatar have a lower share and the UAE has the lowest one. Saudi Arabia has a different trade pattern than the others, exporting to the GCC countries but importing from other countries.

Table.5: Destination of the GCC Exports and Imports in 2006

| Partner | Exports (%) | Imports (%) |
|----------------|-------------|-------------|
| Japan | 21 | 7 |
| S. Korea | 11 | 4 |
| European Union | 10 | 31 |
| USA | 9 | 11 |
| China | 6 | 9 |
| India | 2 | 7 |
| Pakistan | 2 | - |
| Thailand | 3 | - |
| GCC | 5 | 7 |
| Others | 31 | 24 |

Source: IMF

⁵ European Central Bank, Occasional Paper Series, No.92, July 2008

The composition and the destinations of trade in GCC in 2007 are presented separately in Tables 6-11. Asia, the EU and the US are the predominant destination of the GCC exports. The GCC market is important for the EU countries. The GCC has significant bilateral trade relationships with the UK and Germany as well as Spain, France and Italy⁶. The GCC countries are the importers of machinery and transport equipment, such as power generation plants, railway locomotives and aircraft as well as manufactured goods from the EU, and the exporters of oil and refined products such as petrochemicals and aluminium. The EU countries also imports oil from the former Soviet Union countries and North Africa. Currently, the EU and the GCC are negotiating a free trade agreement (FTA). They aimed at a coordination and divergence not only in trade and investment related issues, but also in areas like human rights, terrorism and illegal immigration.

The United States is traditionally an important partner for the GCC. However, after September 2001, since the United States imposed restrictions on the GCC investment, the GCC countries have directed their investments to the Arab region⁷. So the GCC capital invested in the United States and also Europe has been redirected to Arab countries. Egypt, Jordan and Morocco have become attractive investment destinations for the GCC countries. Trade between the US and the GCC has grown significantly since 2003. GCC maintains a significant trade surplus with the US, mainly due to increasing oil prices. The GCC exports to the US are dominated by oil and gas sales; whereas the US exports to the GCC are determined as capital and technology intensive goods; mainly aerospace products and parts, automobiles, agricultural and construction machinery, engines, turbines and power transmission equipment, and general purpose machinery. Specifically, the United States is the largest trading partner of Saudi Arabia among the GCC countries. The US imports petroleum and petroleum products from Saudi Arabia, and exports machinery, transport equipments-aircraft and motor cars. In addition, the UAE is the largest export market of the US in the region. Its import consists of machineries; transport equipment-cars, predominantly aircraft and parts.

The share of Japan⁸ alone is higher than the total of the EU and the US. Japan has been interested in the region through involvement in oil-related projects and increased investment in the region⁹. The GCC countries export oil to Japan, but import automobiles and auto parts

⁶ Hertog, S., EU-GCC Relations in the Era of the Second Oil Boom, European and the Middle East, CAP Working Paper, December 2007.

⁷ Instead of investing revenues in U.S. treasury bills or depositing earnings in Eurodollar accounts at multinational banks, the oil producers started to use their oil to accumulate foreign exchange reserves.

⁸ The most important destination for the UAE exports is Japan. Moore, M., The US-UAE Trade and Investment Relationship, US-UAE Business Council, George Washington University, January 2008.

⁹ Echagüe, A., the European Union and the Gulf Cooperation Council, Fride Working Paper. 39, May 2007.

from Japan. Japan and the GCC are negotiating on FTA, primarily aiming at fostering trade and easing investment. S. Korea and the GCC have developed bilateral trade rapidly in the last decade. The GCC countries export oil to Korea and import automobiles, various machinery, engines, iron and ships.

Trade relations between China and the GCC have expanded over the past decade. As Chinese economy grows and China's demand for energy increases, the trade relationship between China and the GCC is noteworthy. China's imports from the GCC mostly consist of oil, mainly from Saudi Arabia. The GCC imports electrical machinery, machinery appliances, textiles, iron and steel from China. It is evident that trade relations between China and the GCC have a great potential when the heavy reliance of China on oil imports is taken into consideration. The GCC expects significant gains from deeper trade relations with China, since cheaply produced consumer goods are important for growing markets of the GCC countries. In addition, China and India have the energy cooperation with the GCC and they challenge to the US energy interest in the region. Moreover, China and India both have invested in Iran's oil and natural gas sectors¹⁰. India is another important destination for the GCC countries. Industrial diversification policies of the GCC countries have improved economic cooperation with India. India imports a large portion of oil from the GCC region. This seems to make India more energy dependent on these countries.

The GCC countries have a strong relationship with the rest of the Islamic countries not only due to common religious values, but also they have some further common factors with them.¹¹ Some of these countries are also the members of OPEC and they coordinate their policies in oil markets. The GCC countries also, receive a significant amount of labour force from Pakistan, Egypt and Indonesia.¹² Furthermore, bilateral agreements between governments have resulted in many economic collaborations and strategic partnerships.

Egypt, Jordan and Pakistan have improved their economic relationships with the GCC countries and they depend more on the GCC for remittances¹³. Pakistani immigrants joined the workforce with a highest population in Saudi Arabia, and followed by the UAE, Kuwait, Oman, Qatar, and Bahrain respectively. Since 2005, Pakistan receives large scale of foreign investment from the GCC countries. These are in the real estate, infrastructure development, and steel, shipping, energy sectors. In addition, the banking and financial sectors in Pakistan

¹⁰ In October 2004, China and Iran signed a 25 year agreement. Habibi, N. And Woetz, E., US- Arab Economic Relations and Obama Administration, Middle East Brief, Brandeis University, Crown Center for Middle East Studies, No.34, February 2009.

¹¹ The 4th World Islamic Economic Forum, 2008.

¹² There is also a high ratio of immigration flow from India to the GCC.

¹³ *Middle East and Central Asia*, Regional Economic Outlook, World Economic and Financial Surveys, IMF, May 2009.

have been enhanced by the GCC countries. Pakistan has an economic relationship with Oman in the financial, telecommunications and IT sectors. Saudi investment in the Pakistani steel sector has improved the production capacity in this sector. Kuwait contributes the oil refinery and infrastructure projects in Pakistan. The UAE has the largest share of foreign direct investment in Pakistan.

Table.6: Merchandise Trade in Bahrain -2007

| Share in world total exports (%) | | Share in world total imports (%) | |
|---|----------------------------------|---|-----------------------------------|
| 0.10 | | 0.08 | |
| Product | Share in total exports(%) | Product | Share in total imports (%) |
| Agricultural products | 0.5 | Agricultural products | 5.6 |
| Fuels and mining products | 89.7 | Fuels and mining products | 59.1 |
| Manufactures | 9.8 | Manufactures | 35.2 |
| Exports to | Share in total exports(%) | Imports from | Share in total imports (%) |
| 1- Saudi Arabia | 5.3 | 1- European Union (27) | 11.4 |
| 2- United States | 2.7 | 2-Australia | 6.3 |
| 3- European Union (27) | 2.4 | 3- Japan | 5.2 |
| 4- UAE | 1.5 | 4- Saudi Arabia | 4.8 |
| 5- India | 1.0 | 5- China | 5.2 |

Source: WTO, Trade Profiles 2008

Table.7: Merchandise Trade in Kuwait -2007

| Share in world total exports (%) | | Share in world total imports (%) | |
|---|----------------------------------|---|-----------------------------------|
| 0.45 | | 0.17 | |
| Product | Share in total exports(%) | Product | Share in total imports (%) |
| Agricultural products | 0.2 | Agricultural products | 12.0 |
| Fuels and mining products | 96.1 | Fuels and mining products | 2.3 |
| Manufactures | 3.7 | Manufactures | 85.7 |
| Exports to | Share in total exports(%) | Imports from | Share in total imports (%) |
| 1- Japan | 20.3 | 1- European Union (27) | 33.2 |
| 2- United States | 11.0 | 2- United States | 10.6 |
| 3- European Union (27) | 7.8 | 3- Japan | 9.6 |
| 4- Taiwan | 3.8 | 4- Saudi Arabia | 6.5 |
| 5- Singapore | 2.2 | 5- China | 4.4 |

Source: WTO, Trade Profiles 2008

Table.8: Merchandise Trade in Oman -2007

| Share in world total exports (%) | | Share in world total imports (%) | |
|---|----------------------------------|---|-----------------------------------|
| 0.18 | | 0.11 | |
| Product | Share in total exports(%) | Product | Share in total imports (%) |
| Agricultural products | 1.9 | Agricultural products | 10.3 |
| Fuels and mining products | 95.5 | Fuels and mining products | 8.8 |
| Manufactures | 2.6 | Manufactures | 80.4 |
| Exports to | Share in total exports(%) | Imports from | Share in total imports (%) |
| 1- S. Korea | 4.2 | 1- UAE | 25.9 |
| 2- UAE | 1.9 | 2- European Union (27) | 19.2 |
| 3- European Union (27) | 1.2 | 3- Japan | 17.3 |
| 4- Japan | 0.9 | 4- India | 5.3 |
| 5- Saudi Arabia | 0.7 | 5- United States | 5.2 |

Source: WTO, Trade Profiles 2008

Table.9: Merchandise Trade in Qatar -2007

| Share in world total exports (%) | | Share in world total imports (%) | |
|---|----------------------------------|---|-----------------------------------|
| 0.30 | | 0.15 | |
| Product | Share in total exports(%) | Product | Share in total imports (%) |
| Agricultural products | 0.1 | Agricultural products | 5.5 |
| Fuels and mining products | 93.1 | Fuels and mining products | 3.3 |
| Manufactures | 6.8 | Manufactures | 87.2 |
| Exports to | Share in total exports(%) | Imports from | Share in total imports (%) |
| 1- Japan | 41.5 | 1- European Union (27) | 34.8 |
| 2- S. Korea | 13.9 | 2- Japan | 12.0 |
| 3- Singapore | 9.5 | 3- United States | 9.9 |
| 4- India | 4.9 | 4- UAE | 6.0 |
| 5- UAE | 4.3 | 5- China | 5.8 |

Source: WTO, Trade Profiles 2008

Table.10: Merchandise Trade in Saudi Arabia -2007

| Share in world total exports (%) | | Share in world total imports (%) | |
|---|----------------------------------|---|-----------------------------------|
| 1.68 | | 0.63 | |
| Product | Share in total exports(%) | Product | Share in total imports (%) |
| Agricultural products | 1.0 | Agricultural products | 13.8 |
| Fuels and mining products | 88.2 | Fuels and mining products | 4.8 |
| Manufactures | 10.6 | Manufactures | 80.1 |
| Exports to | Share in total exports(%) | Imports from | Share in total imports (%) |
| 1- Japan | 26.8 | 1- European Union (27) | 31.9 |
| 2- Taiwan | 23.6 | 2- United States | 13.6 |
| 3- United States | 17.5 | 3- China | 9.7 |
| 4- European Union (27) | 7.1 | 4- Japan | 8.7 |
| 5- UAE | 3.6 | 5- S. Korea | 4.5 |

Source: WTO, Trade Profiles 2008

Table.11: Merchandise Trade in UAE -2007

| Share in world total exports (%) | | Share in world total imports (%) | |
|---|----------------------------------|---|-----------------------------------|
| 1.24 | | 0.93 | |
| Product | Share in total exports(%) | Product | Share in total imports (%) |
| Agricultural products | 3.6 | Agricultural products | 8.6 |
| Fuels and mining products | 60.4 | Fuels and mining products | 6.9 |
| Manufactures | 32.0 | Manufactures | 79.3 |
| Exports to | Share in total exports(%) | Imports from | Share in total imports (%) |
| 1- Japan | 25.5 | 1- European Union (27) | 23.0 |
| 2- Taiwan | 11.4 | 2- China | 8.7 |
| 3- Iran | 3.6 | 3- India | 8.7 |
| 4- India | 3.3 | 4- United States | 6.5 |
| 5- UAE | 2.0 | 5- Japan | 6.0 |

Source: WTO, Trade Profiles 2008

3. A Modified Gravity Model of the GCC Trade

The basic gravity model based on Newton's gravity equation states that the volume of foreign 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 Tinbergen (1962) and then continued by Linnemann (1966) and many others. 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 they 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 1990 and 2004 and found that the income variables and the dummy 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 country¹⁴ 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 UN-

¹⁴ They are members of WTO. Bahrain and Kuwait since 1 January 1995, Qatar since January 1996, the United Arab Emirates since April 1996, Oman since November 2000, and Saudi Arabia since December 2005.

COMTRADE database and the income data is drawn from IMF International Finance Statistics (IFS). All the variables, except 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, firstly, GDP based on the purchasing power parity has been used to facilitate the cross country comparisons. However, the purchasing power parity¹⁵ (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 instrument¹⁶ 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 cost with a negative sign. Dummy variables¹⁷ are the GCC dummy, the EU-15 dummy, other oil producer countries dummy and ASIA dummy. The coefficient on each 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.

¹⁵ OECD (2005), New GDP Comparisons Based on Purchasing Power Parities for the Year 2002.

¹⁶ This variable with the first lagged values of trade and income, and the dummy variables are used as the instruments of the GMM model.

¹⁷ See Appendix for details.

The estimation approach of this paper includes two steps: (1) Fixed effect trade models have been estimated in order to obtain unobservable partner country heterogeneity¹⁸ 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. The following flow chart illustrates the detailed steps of this analysis.

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 specification¹⁹. In the second step, the trade and country effects equations controlled by the modified gravity models have been estimated simultaneously for each GCC country.

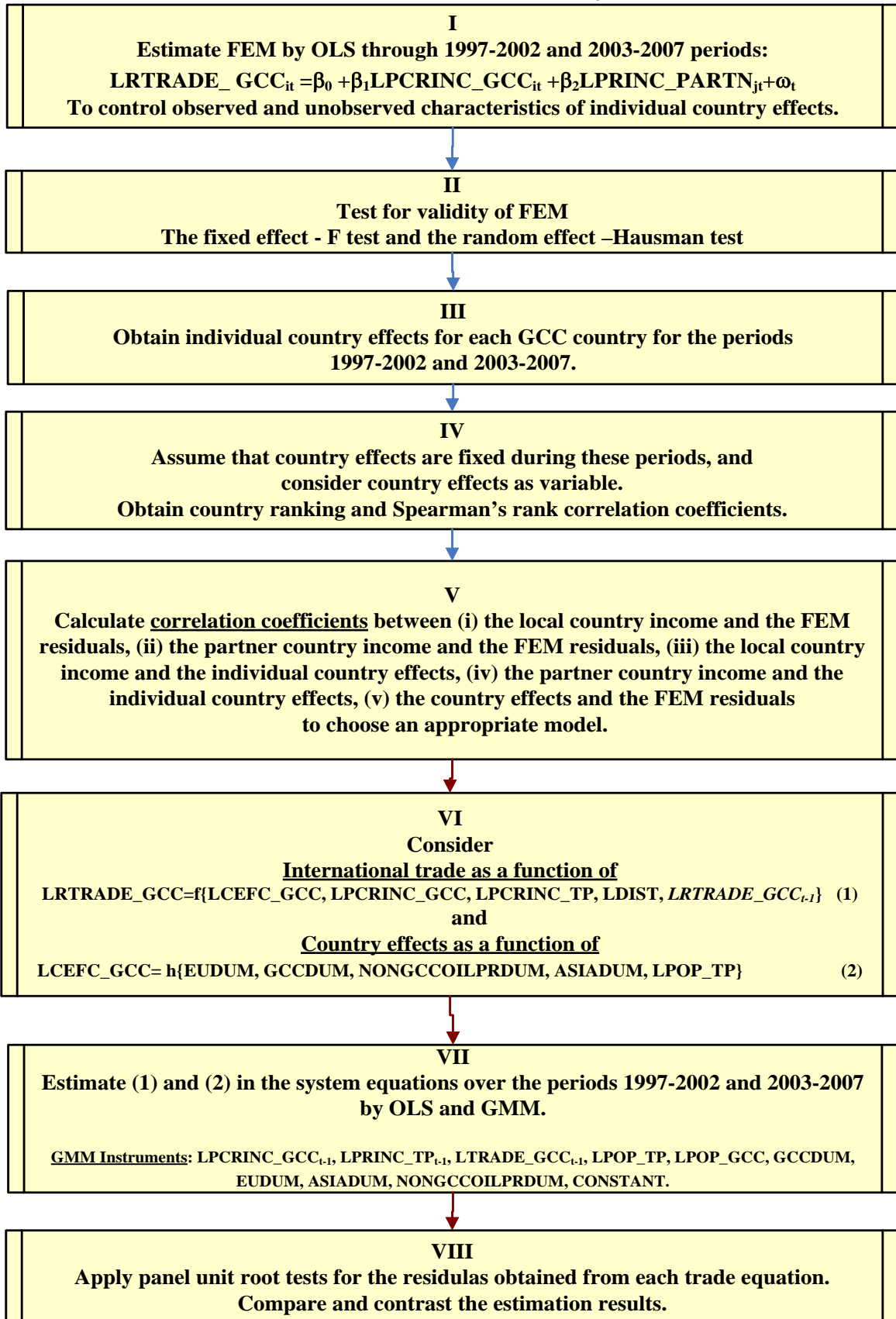
It is believed that panel residual unit root tests help to distinguish a well specified model from a misspecified model. Since the error term on an econometric model varies with the structure of the model and the estimation method, the stationarity of the error term ensures that the linear combination of the variables is stationary. Furthermore, this result confirms the long run equilibrium relationship for the static trade equation. For these purposes the Im, Pesaran and Shin- and the Levin, Lin and Chu-t panel unit root tests²⁰ with individual fixed effects and trend effects have been applied to estimated residuals.

¹⁸ 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.

¹⁹ Zarzoso and Lehmann (2003) also suggest a two step estimation technique.

²⁰ 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.

The flow chart of the econometric analysis



3.2 Econometric and Economic 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 custom 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 test²¹ 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. Appendix-A Table.1 presents the correlation coefficients and supports the exogeneity of income variables over the two estimation periods facilitating the use of OLS estimators²². 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.

Appendix-B Table 1 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 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

²¹ 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.

²² 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.

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 Appendix B Table 2, and they provide information for the following results:

- (1) **Bahrain:** United Arab Emirates is the most important trade partner during 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. United Arab Emirates 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 United Arab Emirates 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 the 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 through 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.

- (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 effects²³ 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 OLS²⁴ and GMM within the modified gravity model assuming that $\theta_1=1$ ²⁵.

Individual country estimation results have been reported in Appendix C²⁶ in Table 1-6. 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

²³ 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.

²⁴ OLS results are identical to the WLS results.

²⁵ 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.

²⁶ 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.

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 the model specifications are better through the 2003 and 2007 period. This is also confirmed by the residuals panel unit root tests²⁷ in Appendix D.

For a comparative country analysis, it would be better to examine the static estimation results in Table 12 and compare the role of each variable in two estimation period. 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 the trade patterns. The OLS and GMM coefficients on 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.²⁸ As the GCC countries get wealthier, their demand for high-valued and capital intensive imported goods like machinery, mechanical appliances and automobiles increase, and this directly lead 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 of the GCC countries enlarges at the same time as their trade partners' income increase.

²⁷ 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.

²⁸ 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.

The estimated values are less than one implying that trade increases less than proportionately. 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. It is possible to think about many reasoning for insignificance. One reason 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 Japan, South Korea, and the US where the low transport costs give GCC producers some competitive advantage²⁹. Moreover, the GCC countries import high-tech and manufactured product like machinery and mechanical appliances, vehicles, electrical machinery and equipment. Since these are not produced in neighbouring countries, they are imported both from developed countries, such as the US, Japan, EU, S. Korea, and developing countries with low labour costs, like China, India, Thailand, Malaysia, and Pakistan. Second reason is 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 reason³⁰ 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 our context, it is not surprising to obtain an insignificant coefficient on distance variable since technological developments in production,

²⁹ 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.

³⁰ 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.

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.

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.

Table 12: Comparison of the Static Model Coefficients

| Variable | 1997-2002 | | 2003-2007 | |
|------------------------------------|-----------|--------|-----------|--------|
| | OLS | GMM | OLS | GMM |
| GCC income | | | | |
| LPCRINC_BAHR | 1.207 | 1.378 | 1.539 | 1.397 |
| LPCRINC_KUW | 0.986 | 0.932 | 1.615 | 0.999 |
| LPCRINC_OMA | 0.713 | 1.003 | 1.468 | 1.327 |
| LPCRINC_QAT | 0.575 | 0.739 | 1.452 | 1.532 |
| LPCRINC_SAU | 1.284 | -3.179 | 1.532 | 1.588 |
| LPCRINC_UAE | 0.941 | 4.473 | 2.005 | 1.863 |
| Partner income | | | | |
| LPCRINC_TP _{BAHR} | 0.811 | 0.823 | 0.458 | 0.458 |
| LPCRINC_TP _{KUW} | -0.061 | -0.073 | 0.514 | 0.515 |
| LPCRINC_TP _{OMA} | -0.063 | -0.071 | 0.668 | 0.672 |
| LPCRINC_TP _{QAT} | 0.570 | 0.548 | 0.567 | 0.572 |
| LPCRINC_TP _{SAU} | 0.091 | 0.091 | 0.433 | 0.433 |
| LPCRINC_TP _{UAE} | -0.226 | -0.229 | 0.122 | 0.125 |
| EU dummy | | | | |
| EUDUM _{BAHR} | insig. | insig. | insig. | 0.413 |
| EUDUM _{KUW} | 2.175 | 2.137 | 1.028 | 0.655 |
| EUDUM _{OMA} | 2.128 | 2.773 | 0.506 | 0.473 |
| EUDUM _{QAT} | 0.916 | 1.037 | 0.858 | 0.962 |
| EUDUM _{SAU} | 1.889 | 1.617 | 1.004 | 0.503 |
| EUDUM _{UAE} | 2.214 | 2.377 | 1.216 | 1.345 |
| GCC Dummy | | | | |
| GCCDUM _{BAHR} | 2.949 | 3.124 | 2.862 | 2.878 |
| GCCDUM _{KUW} | 2.665 | 2.482 | 2.152 | 1.788 |
| GCCDUM _{OMA} | 3.659 | 3.958 | 3.075 | 3.045 |
| GCCDUM _{QAT} | 3.457 | 3.451 | 2.957 | 3.119 |
| GCCDUM _{SAU} | 1.836 | 1.465 | 2.041 | 1.653 |
| GCCDUM _{UAE} | 3.195 | 3.009 | 2.779 | 2.629 |
| Non-GCC Oil Producers Dummy | | | | |
| NONGCCOILPRDUM _{BAHR} | -1.255 | insig. | -0.894 | insig. |
| NONGCCOILPRDUM _{KUW} | insig. | -0.439 | -0.859 | -1.491 |
| NONGCCOILPRDUM _{OMA} | insig. | -0.454 | -1.157 | -1.228 |
| NONGCCOILPRDUM _{QAT} | -1.072 | insig. | -0.776 | -0.617 |
| NONGCCOILPRDUM _{SAU} | insig. | -0.677 | insig. | -1.171 |
| NONGCCOILPRDUM _{UAE} | 1.308 | 1.214 | 0.436 | insig. |
| Asia Dummy | | | | |
| ASIADUM _{BAHR} | 1.187 | 1.052 | 0.895 | 1.074 |
| ASIADUM _{KUW} | 2.655 | 2.684 | 2.236 | 1.862 |
| ASIADUM _{OMA} | 3.293 | 4.052 | 2.314 | 2.508 |
| ASIADUM _{QAT} | 2.527 | 2.166 | 2.133 | 1.662 |
| ASIADUM _{SAU} | 1.924 | 1.450 | 1.606 | 1.081 |
| ASIADUM _{UAE} | 2.367 | 2.604 | 1.710 | 2.213 |
| Foreign Population | | | | |
| LPOP_TP _{BAHR} | 0.743 | 0.874 | 0.650 | 0.688 |
| LPOP_TP _{KUW} | 0.479 | 0.347 | 0.650 | 0.703 |
| LPOP_TP _{OMA} | 0.405 | 0.376 | 0.850 | 0.856 |
| LPOP_TP _{QAT} | 0.727 | 0.807 | 0.753 | 0.881 |
| LPOP_TP _{SAU} | 0.482 | 0.430 | 0.717 | 0.696 |
| LPOP_TP _{UAE} | 0.319 | 0.213 | 0.506 | 0.431 |

Distance variable is insignificant for all cases.

4. Conclusion

In this paper, the research question is whether the trade flows of each GCC country with their partners have sustained or they have developed new relations mainly after 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 in 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 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 being 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 been changed certainly so that Asian countries have moved above the EU countries and the US after 2003.

(2) With the knowledge of new promising export markets and trade opportunities, the GCC countries have increased their trade activities and the standard of living after 2003.

(3) New approach to the standard gravity model has provided an enhancing effect on bilateral trade, but eliminated the sensitivity of distance to trade. This result reveals that the gravity model relating trade flows to distance variable has become incoherent because of technological developments in production, transportation and infrastructure facilities in this

century. Thus, in this study, there is an evidence that gravity model is not the appropriate specification for the GCC trade relations.

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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_j :Gulf Cooperation Council, j=BAHR, KUW, OMA, QAT, SAU, UAE

TP_i: Trade Partner,

i=1,...,56 for BAH;

i=1,...,61 for KUW;

i=1,...,57 for OMA;

i=1,...,61 for QAT;

i=1,...,65 for SAU;

i=1,...,67 for UAE.

LCEFC_j: Natural log of individual country effect obtained from the related FEM.

LRTRADE: Natural of log of Real Total Trade (constant in 2000=100 US\$)

LPCRINC: Natural log of Per Capita Real GDP (constant in 2000=100 US\$)

LDIST_j: Natural log of Distance between Capital Cities.

LPOP: Natural log of Population

EU_{DU}M_j : 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_j : Takes 1 if the partner is the member of GCC;, otherwise 0.

ASIADUM_j, 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

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

Top 20 World Oil Producers:

Algeria

Brazil

Canada

Iran

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

Mexico

Norway

Russia

US

APPENDIX-A

Table.1: Correlation coefficients

1997-2002

| | <u>FEM Residual</u> | <u>LCEFC</u> |
|----------------------|---------------------|---------------|
| <u>LRTRADE_GCC</u> | | |
| BAHRAIN | 0.242 | 0.806 |
| KUWAIT | 0.237 | 0.969 |
| OMAN | 0.205 | 0.978 |
| QATAR | 0.247 | 0.904 |
| SAUDI ARABIA | 0.175 | 0.981 |
| UNITED ARAB EMIRATES | 0.166 | 0.972 |
| <u>LPCRGDP_GCC</u> | | |
| BAHRAIN | 0.051 | 0.000 |
| KUWAIT | 0.012 | 0.010 |
| OMAN | -0.038 | -0.006 |
| QATAR | -0.002 | 0.002 |
| SAUDI ARABIA | -0.013 | 0.008 |
| UNITED ARAB EMIRATES | 0.015 | -0.003 |
| <u>LPCRGDP_TP</u> | | |
| BAHRAIN | 0.005 | -0.454 |
| KUWAIT | 0.000 | 0.171 |
| OMAN | 0.000 | 0.238 |
| QATAR | -0.002 | -0.081 |
| SAUDI ARABIA | -0.001 | 0.242 |
| UNITED ARAB EMIRATES | -0.003 | 0.342 |
| <u>LCEFC</u> | | |
| BAHRAIN | 0.000 | |
| KUWAIT | 0.000 | |
| OMAN | 0.000 | |
| QATAR | 0.000 | |
| SAUDI ARABIA | 0.000 | |
| UNITED ARAB EMIRATES | 0.000 | |

2003-2007

| | <u>FEM Residual</u> | <u>LCEFC</u> |
|----------------------|---------------------|---------------|
| <u>LRTRADE_GCC</u> | | |
| BAHRAIN | 0.247 | 0.886 |
| KUWAIT | 0.215 | 0.912 |
| OMAN | 0.187 | 0.880 |
| QATAR | 0.227 | 0.865 |
| SAUDI ARABIA | 0.137 | 0.922 |
| UNITED ARAB EMIRATES | 0.172 | 0.965 |
| <u>LPCRGDP_GCC</u> | | |
| BAHRAIN | 0.058 | -0.013 |
| KUWAIT | 0.029 | -0.011 |
| OMAN | 0.061 | -0.003 |
| QATAR | -0.003 | 0.034 |
| SAUDI ARABIA | 0.007 | -0.005 |
| UNITED ARAB EMIRATES | 0.002 | -0.007 |
| <u>LPCRGDP_TP</u> | | |
| BAHRAIN | 0.006 | -0.311 |
| KUWAIT | 0.004 | -0.245 |
| OMAN | 0.008 | -0.328 |
| QATAR | 0.001 | -0.214 |
| SAUDI ARABIA | 0.001 | -0.174 |
| UNITED ARAB EMIRATES | -0.008 | 0.053 |
| <u>LCEFC</u> | | |
| BAHRAIN | 0.000 | |
| KUWAIT | 0.000 | |
| OMAN | 0.001 | |
| QATAR | 0.000 | |
| SAUDI ARABIA | 0.000 | |
| UNITED ARAB EMIRATES | 0.000 | |

APPENDIX-B

**Table.1: 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.2: COUNTRY RANKING

BAHRAIN

| <u>1997-2002</u> | <u>COUNTRY</u> | <u>2003-2007</u> | <u>COUNTRY</u> | <u>1997-2002</u> | <u>COUNTRY</u> | <u>2003-2007</u> | <u>COUNTRY</u> |
|------------------|----------------|------------------|----------------|------------------|----------------|------------------|----------------|
| 1 | UAE | 1 | UAE | | | | |
| 2 | India | 2 | Saudi Arabia | 29 | Australia | 29 | South Africa |
| 3 | Pakistan | 3 | India | 30 | South Africa | 30 | Egypt |
| 4 | Saudi Arabia | 4 | China | 31 | Switzerland | 31 | Morocco |
| 5 | China | 5 | Kenya | 32 | Hong Kong | 32 | Lebanon |
| 6 | Kenya | 6 | USA | 33 | Netherlands | 33 | Hong Kong |
| 7 | Indonesia | 7 | Pakistan | 34 | Spain | 34 | Tunisia |
| 8 | Thailand | 8 | Japan | 35 | Belgium/Lux. | 35 | Syria |
| 9 | USA | 9 | Thailand | 36 | Argentina | 36 | Finland |
| 10 | S. Korea | 10 | S. Korea | 37 | Qatar | 37 | Philippines |
| 11 | Japan | 11 | UK | 38 | Morocco | 38 | Algeria |
| 12 | Malaysia | 12 | Germany | 39 | Sweden | 39 | Canada |
| 13 | UK | 13 | Indonesia | 40 | Romania | 40 | Austria |
| 14 | Iran | 14 | Malaysia | 41 | Denmark | 41 | Hungary |
| 15 | Brazil | 15 | Iran | 42 | New Zealand | 42 | Sweden |
| 16 | France | 16 | Brazil | 43 | Ireland | 43 | New Zealand |
| 17 | Jordan | 17 | France | 44 | Canada | 44 | Argentina |
| 18 | Philippines | 18 | Italy | 45 | Greece | 45 | Portugal |
| 19 | Germany | 19 | Australia | 46 | Austria | 46 | Denmark |
| 20 | Italy | 20 | Turkey | 47 | Portugal | 47 | Romania |
| 21 | Turkey | 21 | Jordan | 48 | Norway | 48 | Ireland |
| 22 | Syria | 22 | Netherlands | 49 | Finland | 49 | Poland |
| 23 | Egypt | 23 | Oman | 50 | Chile | 50 | Norway |
| 24 | Oman | 24 | Kuwait | 51 | Poland | 51 | Greece |
| 25 | Lebanon | 25 | Switzerland | 52 | Hungary | 52 | Czech Rep |
| 26 | Tunisia | 26 | Qatar | 53 | Czech Rep | 53 | Russia |
| 27 | Kuwait | 27 | Spain | 54 | Mexico | 54 | Cyprus |
| 28 | Algeria | 28 | Belgium/Lux. | 55 | Cyprus | 55 | Chile |
| | | | | 56 | Russia | 56 | Mexico |

KUWAIT

| 1997-2002 | COUNTRY | 2003-2007 | COUNTRY | 1997-2002 | COUNTRY | 2003-2007 | COUNTRY |
|------------------|----------------|------------------|----------------|------------------|----------------|------------------|----------------|
| 1 | Japan | 1 | India | 31 | Canada | 31 | South Africa |
| 2 | USA | 2 | UAE | 32 | Oman | 32 | Bahrain |
| 3 | S. Korea | 3 | Pakistan | 33 | Qatar | 33 | Morocco |
| 4 | Singapore | 4 | S. Korea | 34 | Finland | 34 | Argentina |
| 5 | Netherlands | 5 | China | 35 | Jordan | 35 | Sweden |
| 6 | UK | 6 | Japan | 36 | Lebanon | 36 | Finland |
| 7 | Germany | 7 | Indonesia | 37 | Egypt | 37 | Canada |
| 8 | Pakistan | 8 | USA | 38 | Austria | 38 | New Zealand |
| 9 | India | 9 | Singapore | 39 | Philippines | 39 | Austria |
| 10 | France | 10 | Netherlands | 40 | New Zealand | 40 | Romania |
| 11 | Saudi Arabia | 11 | Egypt | 41 | Argentina | 41 | Denmark |
| 12 | Italy | 12 | Saudi Arabia | 42 | Mexico | 42 | Qatar |
| 13 | Indonesia | 13 | UK | 43 | Portugal | 43 | Hungary |
| 14 | China | 14 | Thailand | 44 | Greece | 44 | Tunisia |
| 15 | UAE | 15 | Germany | 45 | Romania | 45 | Portugal |
| 16 | Australia | 16 | France | 46 | Morocco | 46 | Oman |
| 17 | Thailand | 17 | Iran | 47 | Hungary | 47 | Ireland |
| 18 | Turkey | 18 | Belgium/Lux.. | 48 | Tunisia | 48 | Poland |
| 19 | Swiss | 19 | Malaysia | 49 | Czech | 49 | Czech |
| 20 | Belgium/Lux. | 20 | Italy | 50 | Poland | 50 | Slovakia |
| 21 | Spain | 21 | Syria | 51 | Russia | 51 | Greece |
| 22 | Hong Kong | 22 | Turkey | 52 | Cyprus | 52 | Algeria |
| 23 | Malaysia | 23 | Australia | 53 | Norway | 53 | Mexico |
| 24 | Denmark | 24 | Jordan | 54 | Chile | 54 | Chile |
| 25 | Bahrain | 25 | Lebanon | 55 | Kenya | 55 | Russia |
| 26 | Syria | 26 | Spain | 56 | Malta | 56 | Cyprus |
| 27 | Iran | 27 | Hong Kong | 57 | Guatemala | 57 | Bulgaria |
| 28 | South Africa | 28 | Philippines | 58 | Algeria | 58 | Norway |
| 29 | Sweden | 29 | Swiss | 59 | Bulgaria | 59 | Guatemala |
| 30 | Ireland | 30 | Kenya | 60 | Slovakia | 60 | Malta |
| | | | | 61 | Israel | 61 | Israel |

OMAN

| <u>1997-2002</u> | <u>COUNTRY</u> | <u>2003-2007</u> | <u>COUNTRY</u> | <u>1997-2002</u> | <u>COUNTRY</u> | <u>2003-2007</u> | <u>COUNTRY</u> |
|------------------|----------------|------------------|----------------|------------------|----------------|------------------|----------------|
| 1 | Japan | 1 | UAE | 29 | Ireland | 29 | Belgium |
| 2 | UAE | 2 | China | 30 | Argentina | 30 | Qatar |
| 3 | S. Korea | 3 | Thailand | 31 | Jordan | 31 | Sweden |
| 4 | China | 4 | India | 32 | Brazil | 32 | Russia |
| 5 | Thailand | 5 | S. Korea | 33 | Austria | 33 | Hong Kong |
| 6 | USA | 6 | Japan | 34 | Indonesia | 34 | Egypt |
| 7 | UK | 7 | Malaysia | 35 | Finland | 35 | Swiss |
| 8 | Singapore | 8 | Pakistan | 36 | Canada | 36 | Austria |
| 9 | Saudi Arabia | 9 | Saudi Arabia | 37 | South Africa | 37 | Canada |
| 10 | Germany | 10 | USA | 38 | Lebanon | 38 | Kenya |
| 11 | Italy | 11 | UK | 39 | Greece | 39 | Kuwait |
| 12 | France | 12 | Germany | 40 | Egypt | 40 | Chile |
| 13 | Malaysia | 13 | Singapore | 41 | Chile | 41 | Lebanon |
| 14 | India | 14 | South Africa | 42 | Iran | 42 | Denmark |
| 15 | Australia | 15 | Italy | 43 | Cyprus | 43 | Morocco |
| 16 | Netherlands | 16 | Indonesia | 44 | Norway | 44 | Romania |
| 17 | Swiss | 17 | Spain | 45 | Tanz | 45 | Finland |
| 18 | Hong Kong | 18 | France | 46 | Tunisia | 46 | Greece |
| 19 | Spain | 19 | Brazil | 47 | Mexico | 47 | Ireland |
| 20 | New Zealand | 20 | Jordan | 48 | Morocco | 48 | Tunisia |
| 21 | Belgium | 21 | Australia | 49 | Portugal | 49 | Hungary |
| 22 | Pakistan | 22 | Tanz | 50 | Hungary | 50 | Slovakia |
| 23 | Bahrain | 23 | Netherlands | 51 | Russia | 51 | Czech |
| 24 | Kuwait | 24 | Iran | 52 | Kenya | 52 | Portugal |
| 25 | Sweden | 25 | Turkey | 53 | Czech | 53 | Algeria |
| 26 | Qatar | 26 | New Zealand | 54 | Romania | 54 | Mexico |
| 27 | Denmark | 27 | Bahrain | 55 | Slovakia | 55 | Cyprus |
| 28 | Turkey | 28 | Argentina | 56 | Israel | 56 | Norway |
| | | | | 57 | Algeria | 57 | Israel |

QATAR

| <u>1997-2002</u> | <u>COUNTRY</u> | <u>2003-2007</u> | <u>COUNTRY</u> | <u>1997-2002</u> | <u>COUNTRY</u> | <u>2003-2007</u> | <u>COUNTRY</u> |
|------------------|----------------|------------------|----------------|------------------|----------------|------------------|----------------|
| 1 | UAE | 1 | UAE | 32 | Kenya | 32 | Malaysia |
| 2 | Japan | 2 | Japan | 33 | Sudan | 33 | Ethiopia |
| 3 | S. Korea | 3 | India | 34 | Belgium | 34 | Egypt |
| 4 | India | 4 | S. Korea | 35 | Ethiopia | 35 | Morocco |
| 5 | Thailand | 5 | Thailand | 36 | Argentina | 36 | Kuwait |
| 6 | China | 6 | China | 37 | Hong Kong | 37 | Canada |
| 7 | Singapore | 7 | Singapore | 38 | Sweden | 38 | Sudan |
| 8 | USA | 8 | Pakistan | 39 | New Zealand | 39 | Sweden |
| 9 | Saudi Arabia | 9 | Saudi Arabia | 40 | Canada | 40 | Hong Kong |
| 10 | Philippines | 10 | France | 41 | Morocco | 41 | Tanzania |
| 11 | Pakistan | 11 | USA | 42 | Ireland | 42 | Argentina |
| 12 | UK | 12 | Spain | 43 | Romania | 43 | Greece |
| 13 | France | 13 | Philippines | 44 | Tunisia | 44 | Austria |
| 14 | Indonesia | 14 | Germany | 45 | Denmark | 45 | Finland |
| 15 | Germany | 15 | UK | 46 | Mexico | 46 | Tunisia |
| 16 | Italy | 16 | Italy | 47 | Austria | 47 | Algeria |
| 17 | Australia | 17 | Indonesia | 48 | Greece | 48 | Romania |
| 18 | Jordan | 18 | Iran | 49 | Finland | 49 | Czech Rep |
| 19 | Syria | 19 | South Africa | 50 | Chile | 50 | Denmark |
| 20 | Iran | 20 | Syria | 51 | Cyprus | 51 | Mexico |
| 21 | Spain | 21 | Turkey | 52 | Tanzania | 52 | Hungary |
| 22 | Brazil | 22 | Australia | 53 | Hungary | 53 | Poland |
| 23 | South Africa | 23 | Brazil | 54 | Norway | 54 | Ireland |
| 24 | Bahrain | 24 | Belgium | 55 | Czech Rep | 55 | Portugal |
| 25 | Netherlands | 25 | Bahrain | 56 | Portugal | 56 | Russia |
| 26 | Turkey | 26 | Oman | 57 | Poland | 57 | Slovakia |
| 27 | Malaysia | 27 | Jordan | 58 | Algeria | 58 | Chile |
| 28 | Egypt | 28 | Switzerland | 59 | Russia | 59 | Norway |
| 29 | Kuwait | 29 | Netherlands | 60 | Israel | 60 | Cyprus |
| 30 | Oman | 30 | New Zealand | 61 | Slovakia | 61 | Israel |
| 31 | Switzerland | 31 | Kenya | | | | |

SAUDI ARABIA

| 1997-2002 | COUNTRY | 2003-2007 | COUNTRY | 1997-2002 | COUNTRY | 2003-2007 | COUNTRY |
|------------------|----------------|------------------|----------------|------------------|----------------|------------------|----------------|
| 1 | USA | 1 | China | 34 | Sudan | 34 | Iran |
| 2 | Japan | 2 | UAE | 35 | Portugal | 35 | Kuwait |
| 3 | S. Korea | 3 | USA | 36 | Jordan | 36 | Swiss |
| 4 | Singapore | 4 | India | 37 | New Zealand | 37 | Lebanon |
| 5 | UK | 5 | Japan | 38 | Oman | 38 | Oman |
| 6 | France | 6 | S. Korea | 39 | Ireland | 39 | Sweden |
| 7 | China | 7 | Pakistan | 40 | Qatar | 40 | Hong Kong |
| 8 | Italy | 8 | Thailand | 41 | Austria | 41 | Tanz |
| 9 | Germany | 9 | Indonesia | 42 | Kenya | 42 | Qatar |
| 10 | India | 10 | Philippines | 43 | Lebanon | 43 | Portugal |
| 11 | Netherlands | 11 | Singapore | 44 | Ethiopia | 44 | Mexico |
| 12 | UAE | 12 | South Africa | 45 | Denmark | 45 | Austria |
| 13 | Indonesia | 13 | Italy | 46 | Mexico | 46 | Finland |
| 14 | Spain | 14 | Jordan | 47 | Iran | 47 | Argentina |
| 15 | Pakistan | 15 | Germany | 48 | Finland | 48 | New Zealand |
| 16 | Thailand | 16 | France | 49 | Russia | 49 | Russia |
| 17 | Brazil | 17 | Brazil | 50 | Chile | 50 | Tunisia |
| 18 | Turkey | 18 | Turkey | 51 | Tanz | 51 | Poland |
| 19 | Philippines | 19 | Ethiopia | 52 | Tunisia | 52 | Ireland |
| 20 | Australia | 20 | Netherlands | 53 | Argentina | 53 | Romania |
| 21 | Egypt | 21 | Egypt | 54 | Romania | 54 | Hungary |
| 22 | Malaysia | 22 | UK | 55 | Poland | 55 | Denmark |
| 23 | Swiss | 23 | Morocco | 56 | Norway | 56 | Algeria |
| 24 | Greece | 24 | Spain | 57 | Mauritius | 57 | Ghana |
| 25 | Morocco | 25 | Sudan | 58 | Algeria | 58 | Mauritius |
| 26 | Belgium | 26 | Malaysia | 59 | Guatemala | 59 | Chile |
| 27 | Canada | 27 | Syria | 60 | Hungary | 60 | Czech |
| 28 | South Africa | 28 | Bahrain | 61 | Czech | 61 | Guatemala |
| 29 | Bahrain | 29 | Australia | 62 | Ghana | 62 | Norway |
| 30 | Hong Kong | 30 | Greece | 63 | Bulgaria | 63 | Bulgaria |
| 31 | Sweden | 31 | Kenya | 64 | Columbia | 64 | Columbia |
| 32 | Kuwait | 32 | Belgium | 65 | Israel | 65 | Israel |
| 33 | Syria | 33 | Canada | | | | |

UNITED ARAB EMIRATES

| 1997-2002 | COUNRTY | 2003-2007 | COUNRTY | 1997-2002 | COUNRTY | 2003-2007 | COUNRTY |
|------------------|----------------|------------------|----------------|------------------|----------------|------------------|----------------|
| 1 | Japan | 1 | Japan | 35 | Austria | 35 | Tanz |
| 2 | S. Korea | 2 | India | 36 | Russia | 36 | Denmark |
| 3 | USA | 3 | China | 37 | New Zealand | 37 | Jordan |
| 4 | UK | 4 | S. Korea | 38 | Kenya | 38 | Canada |
| 5 | Singapore | 5 | USA | 39 | South Africa | 39 | Sweden |
| 6 | Germany | 6 | Thailand | 40 | Czech | 40 | Czech |
| 7 | France | 7 | UK | 41 | Lebanon | 41 | New Zealand |
| 8 | Oman | 8 | Saudi Arabia | 42 | Norway | 42 | Egypt |
| 9 | Italy | 9 | Iran | 43 | Jordan | 43 | Syria |
| 10 | Hong Kong | 10 | Germany | 44 | Greece | 44 | Lebanon |
| 11 | India | 11 | Pakistan | 45 | Egypt | 45 | Austria |
| 12 | Saudi Arabia | 12 | Singapore | 46 | Argentina | 46 | Romania |
| 13 | China | 13 | France | 47 | Syria | 47 | Ethiopia |
| 14 | Thailand | 14 | Oman | 48 | Uganda | 48 | Ireland |
| 15 | Iran | 15 | Italy | 49 | Cyprus | 49 | Poland |
| 16 | Belgium | 16 | Hong Kong | 50 | Chile | 50 | Argentina |
| 17 | Netherlands | 17 | Malaysia | 51 | Mexico | 51 | Greece |
| 18 | Australia | 18 | Belgium | 52 | Romania | 52 | Uganda |
| 19 | Pakistan | 19 | Netherlands | 53 | Poland | 53 | Morocco |
| 20 | Malaysia | 20 | Turkey | 54 | Tanz | 54 | Norway |
| 21 | Qatar | 21 | Australia | 55 | Portugal | 55 | Mauritius |
| 22 | Swiss | 22 | Indonesia | 56 | Algeria | 56 | Ghana |
| 23 | Bahrain | 23 | Qatar | 57 | Hungary | 57 | Cyprus |
| 24 | Spain | 24 | Swiss | 58 | Ethiopia | 58 | Chile |
| 25 | Indonesia | 25 | Kenya | 59 | Slovenia | 59 | Algeria |
| 26 | Kuwait | 26 | Brazil | 60 | Morocco | 60 | Mexico |
| 27 | Sweden | 27 | Finland | 61 | Tunisia | 61 | Portugal |
| 28 | Philippines | 28 | Kuwait | 62 | Mauritius | 62 | Slovakia |
| 29 | Finland | 29 | Bahrain | 63 | Malta | 63 | Bulgaria |
| 30 | Turkey | 30 | Spain | 64 | Slovakia | 64 | Tunisia |
| 31 | Brazil | 31 | South Africa | 65 | Bulgaria | 65 | Slovenia |
| 32 | Canada | 32 | Philippines | 66 | Ghana | 66 | Malta |
| 33 | Denmark | 33 | Russia | 67 | Israel | 67 | Israel |
| 34 | Ireland | 34 | Hungary | | | | |

APPENDIX-C

Table.1: BAHRAIN

$$LRTRADE_BAHR_t = \theta_0 + \theta_1 LCEFC_BAHR + \theta_2 LPCRINC_BAHR_t + \theta_3 LPCRINC_TP_t + \theta_4 LDIST + \gamma LRTRADE_BAHR_{t-1} + u_t$$

(1)

$$LCEFC_BAHR = \theta_5 + \theta_6 EUDUM + \theta_7 GCCDUM + \theta_8 NONGCCOILPRDUM + \theta_9 ASIADUM + \theta_{10} LPOP_TP + \varepsilon_t$$

(2)

| 1997-2002: | OLS | GMM | |
|---|-----------------------|-----------------------|-----------------------|
| Dependent variable: LRTRADE_BAHR | | | |
| LCEFC | 1.000 [0.013] | 1.017 (0.054) | 1.016 [0.015] |
| LPCRINC_BAHR | 1.207 [0.376] | 1.251 (0.382) | 1.378 [0.550] |
| LPCRINC_TP | 0.811 [0.020] | 0.825 (0.047) | 0.823 [0.019] |
| LDISTANCE | 0.000 [0.027] | 0.008 (0.029) | -0.001 [0.037] |
| LRTRADE_BAHR _{t-1} | | -0.016 (0.052) | |
| Dependent variable: LCEFC_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] |
| NONGCCOILPRDUM | -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] |
| <i>N</i> | 667 | 661 | 652 |
| \bar{R}_1^2 | 0.943 | 0.943 | 0.943 |
| \bar{R}_2^2 | 0.578 | 0.578 | 0.542 |
| <i>SER</i> ₁ | 0.439 | 0.441 | 0.441 |
| <i>SER</i> ₂ | 1.287 | 1.287 | 1.352 |
| Mean of LRTRADE_BAHR | 17.115 | 17.104 | 17.104 |
| Mean of LCEFC_BAHR | 0.011 | 0.011 | 0.000 |
| 2003-2007: | | | |
| | OLS | GMM | |
| Dependent variable: LRTRADE_BAHR | | | |
| LCEFC | 1.000 [0.016] | 0.842 (0.061) | 1.003 [0.016] |
| LPCRINC_BAHR | 1.539 [0.178] | 1.351 (0.192) | 1.397 [0.192] |
| LPCRINC_TP | 0.458 [0.019] | 0.383 (0.034) | 0.458 [0.019] |
| LDISTANCE | -0.000 [0.009] | -0.005 (0.028) | -0.008 [1.916] |
| LRTRADE_BAHR _{t-1} | | 0.154 (0.058) | |
| Dependent variable: LCEFC_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] |
| NONGCCOILPRDUM | -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] |
| <i>N</i> | 556 | 555 | 553 |
| \bar{R}_1^2 | 0.937 | 0.939 | 0.938 |
| \bar{R}_2^2 | 0.567 | 0.568 | 0.539 |
| <i>SER</i> ₁ | 0.427 | 0.423 | 0.428 |
| <i>SER</i> ₂ | 1.129 | 1.129 | 1.170 |
| Mean of LRTRADE_BAHR | 17.619 | 17.620 | 17.620 |
| Mean of LCEFC_BAHR | 0.013 | 0.013 | 0.015 |

GMM Instruments: LPCRINC_BAHR_{t-1}, LPRINC_TP_{t-1}, LTRADE_BAHR_{t-1}, LPOP_TP, LPOP_BAHR, GCCDUM, EUDUM, ASIADUM, NONGCCOILPRDUM, 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.2: KUWAIT

$$LRTRADE_KUW_t = \theta_0 + \theta_1 LCEFC_KUW + \theta_2 LPCRINC_KUW_t + \theta_3 LPCRINC_TP_t + \theta_4 LDIST + \gamma LRTRADE_KUW_{t-1} + u_t$$

(1)

$$LCEFC_KUW = \theta_5 + \theta_6 EUDUM + \theta_7 GCCDUM + \theta_8 NONGCCOILPRDUM + \theta_9 ASIADUM + \theta_{10} LPOP_TP + \varepsilon_t$$

(2)

| 1997-2002: | OLS | GMM | |
|--|-----------------------|-----------------------|-----------------------|
| Dependent variable: LRTRADE_KUW | | | |
| LCEFC | 0.999 [0.013] | 0.703 (0.538) | 1.006 [0.015] |
| LPCRINC_KUW | 0.986 [0.257] | 0.752 (0.246) | 0.932 [2.603] |
| LPCRINC_TP | -0.061 [0.021] | -0.046 (0.020) | -0.073 [0.022] |
| LDISTANCE | 0.000 [0.034] | -0.003 (0.033) | 0.000 [0.036] |
| LRTRADE_KUW _{t-1} | | 0.293 (0.052) | |
| Dependent variable: LCEFC_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] |
| NONGCCOILPRDUM | 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] |
| <i>N</i> | 728 | 722 | 713 |
| \bar{R}_1^2 | 0.943 | 0.948 | 0.943 |
| \bar{R}_2^2 | 0.496 | 0.496 | 0.496 |
| <i>SER</i> ₁ | 0.531 | 0.500 | 0.522 |
| <i>SER</i> ₂ | 1.553 | 1.553 | 1.552 |
| Mean of LRTRADE_KUW | 17.849 | 17.886 | 17.886 |
| Mean of LCEFC_KUW | -0.014 | -0.014 | 0.017 |
| 2003-2007: | | | |
| | OLS | GMM | |
| Dependent variable: LRTRADE_KUW | | | |
| LCEFC | 1.000 [0.013] | 0.997 (0.052) | 0.999 [0.014] |
| LPCRINC_KUW | 1.615 [0.153] | 1.598 (0.174) | 1.488 [0.147] |
| LPCRINC_TP | 0.514 [0.020] | 0.513 (0.034) | 0.515 [0.016] |
| LDISTANCE | -0.000 [0.033] | 0.003 (0.033) | -0.005 [0.042] |
| LRTRADE_KUW _{t-1} | | 0.293 (0.052) | |
| Dependent variable: LCEFC_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] |
| NONGCCOILPRDUM | -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] |
| <i>N</i> | 604 | 603 | 601 |
| \bar{R}_1^2 | 0.955 | 0.955 | 0.955 |
| \bar{R}_2^2 | 0.589 | 0.589 | 0.578 |
| <i>SER</i> ₁ | 0.469 | 0.470 | 0.469 |
| <i>SER</i> ₂ | 1.410 | 1.411 | 1.434 |
| Mean of LRTRADE_KUW | 18.654 | 18.650 | 18.650 |
| Mean of LCEFC_KUW | 0.021 | 0.021 | 0.018 |
| GMM Instruments: LPCRINC_KUW _{t-1} , LPCRINC_TP _{t-1} , LRTRADE_KUW _{t-1} , LPOP_TP, LPOP_KUW, GCCDUM, EUDUM, ASIADUM, NONGCCOILPRDUM, 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.3: OMAN

$$LRTRADE_OMA_t = \theta_0 + \theta_1 LCEFC_OMA + \theta_2 LPCRINC_OMA_t + \theta_3 LPCRINC_TP_t + \theta_4 LDIST + \gamma LRTRADE_OMA_{t-1} + u_t$$

(1)

$$LCEFC_OMA = \theta_5 + \theta_6 EUDUM + \theta_7 GCCDUM + \theta_8 NONGCCOILPRDUM + \theta_9 ASIADUM + \theta_{10} LPOP_TP + \varepsilon_t$$

(2)

| 1997-2002: | OLS | GMM | |
|--|-----------------------|-----------------------|----------------------|
| Dependent variable: LRTRADE_OMA | | | |
| LCEFC | 1.000 [0.011] | 0.723 (0.051) | 1.003 [0.012] |
| LPCRINC_OMA | 0.713 [0.318] | 0.579 (0.307) | 2.959 [0.606] |
| LPCRINC_TP | -0.063 [0.021] | -0.053 (0.020) | -0.071 [0.018] |
| LDISTANCE | -0.000 [0.038] | -0.007 (0.037) | 0.000 [0.031] |
| LRTRADE_OMA _{t-1} | | 0.271 (0.050) | |
| Dependent variable: LCEFC_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] |
| NONGCCOILPRDUM | -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] |
| <i>N</i> | 684 | 681 | 678 |
| \bar{R}_1^2 | 0.958 | 0.961 | 0.952 |
| \bar{R}_2^2 | 0.520 | 0.520 | 0.500 |
| <i>SER</i> ₁ | 0.487 | 0.467 | 0.522 |
| <i>SER</i> ₂ | 1.618 | 1.618 | 1.657 |
| Mean of LRTRADE_OMA | 16.979 | 16.992 | 6.992 |
| Mean of LCEFC_OMA | 0.000 | 0.000 | 0.009 |

| 2003-2007: | OLS | GMM | |
|--|-----------------------|-----------------------|-----------------------|
| Dependent variable: LRTRADE_OMA | | | |
| LCEFC | 1.000 [0.011] | 0.805 (0.054) | 1.004 [0.009] |
| LPCRINC_OMA | 1.468 [0.136] | 1.273 (0.144) | 1.327 [0.146] |
| LPCRINC_TP | 0.668 [0.017] | 0.535 (0.400) | 0.672 [0.015] |
| LDISTANCE | -0.000 [0.033] | -0.003 (0.032) | -0.000 [0.042] |
| LRTRADE_OMA _{t-1} | | 0.193 (0.053) | |
| Dependent variable: LCEFC_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] |
| NONGCCOILPRDUM | -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] |
| <i>N</i> | 565 | 564 | 562 |
| \bar{R}_1^2 | 0.969 | 0.971 | 0.968 |
| \bar{R}_2^2 | 0.724 | 0.723 | 0.717 |
| <i>SER</i> ₁ | 0.383 | 0.375 | 0.384 |
| <i>SER</i> ₂ | 1.162 | 1.162 | 1.179 |
| Mean of LRTRADE_OMA | 17.755 | 17.760 | 17.760 |
| Mean of LCEFC_OMA | -0.012 | -0.012 | -0.003 |

GMM Instruments: LPCRINC_OMA_{t-1}, LPRINC_TP_{t-1}, LTRADE_OMA_{t-1}, LPOP_TP, LPOP_OMA, GCCDUM, EUDUM, ASIADUM, NONGCCOILPRDUM, 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.4: QATAR

$$LRTRADE_QAT_t = \theta_0 + \theta_1 LCEFC_QAT + \theta_2 LPCRINC_QAT_t + \theta_3 LPCRINC_TP_t + \theta_4 LDIST + \gamma LRTRADE_QAT_{t-1} + u_t$$

(1)

$$LCEFC_QAT = \theta_5 + \theta_6 EUDUM + \theta_7 GCCDUM + \theta_8 NONGCCOILPRDUM + \theta_9 ASIADUM + \theta_{10} LPOP_TP + \varepsilon_t$$

(2)

| 1997-2002: | OLS | | GMM |
|--|-----------------------|-----------------------|-----------------------|
| Dependent variable: LRTRADE_QAT | | | |
| LCEFC | 1.000 [0.014] | 0.743 (0.045) | 0.992 [0.016] |
| LPCRINC_QAT | 0.575 [0.215] | 0.495 (0.204) | 0.739 [0.606] |
| LPCRINC_TP | 0.570 [0.022] | 0.411 (0.033) | 0.548 [0.022] |
| LDISTANCE | -0.000 [0.038] | -0.005 (0.038) | 0.010 [0.021] |
| LRTRADE_QAT _{t-1} | | 0.259 (0.042) | |
| Dependent variable: LCEFC_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] |
| NONGCCOILPRDUM | -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] |
| <i>N</i> | 719 | 709 | 691 |
| \bar{R}_1^2 | 0.938 | 0.947 | 0.941 |
| \bar{R}_2^2 | 0.541 | 0.541 | 0.512 |
| <i>SER</i> ₁ | 0.612 | 0.568 | 0.601 |
| <i>SER</i> ₂ | 1.597 | 1.597 | 1.617 |
| Mean of LRTRADE_QAT | 16.773 | 16.791 | 16.991 |
| Mean of LCEFC_QAT | -0.043 | -0.043 | -0.003 |

| 2003-2007: | OLS | | GMM |
|--|----------------------|----------------------|-----------------------|
| Dependent variable: LRTRADE_QAT | | | |
| LCEFC | 0.999 [0.013] | 0.910 (0.054) | 1.002 [0.012] |
| LPCRINC_QAT | 1.452 [0.099] | 1.317 (0.127) | 1.532 [0.099] |
| LPCRINC_TP | 0.567 [0.019] | 0.516 (0.036) | 0.572 [0.018] |
| LDISTANCE | 0.000 [0.031] | 0.001 (0.031) | -0.001 [0.022] |
| LRTRADE_QAT _{t-1} | | 0.086 (0.051) | |
| Dependent variable: LCEFC_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] |
| NONGCCOILPRDUM | -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] |
| <i>N</i> | 609 | 609 | 609 |
| \bar{R}_1^2 | 0.950 | 0.951 | 0.951 |
| \bar{R}_2^2 | 0.635 | 0.635 | 0.621 |
| <i>SER</i> ₁ | 0.474 | 0.472 | 0.475 |
| <i>SER</i> ₂ | 1.229 | 1.229 | 1.254 |
| Mean of LRTRADE_QAT | 18.020 | 18.020 | 18.020 |
| Mean of LCEFC_QAT | 0.003 | 0.002 | 0.003 |

GMM Instruments: LPCRINC_QAT_{t-1}, LPRINC_TP_{t-1}, LTRADE_QAT_{t-1}, LPOP_TP, LPOP_QAT, GCCDUM, EUDUM, ASIADUM, NONGCCOILPRDUM, 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.5: SAUDI ARABIA

$$LRTRADE_SAU_t = \theta_0 + \theta_1 LCEFC_SAU + \theta_2 LPCRINC_SAU_t + \theta_3 LPCRINC_TP_t + \theta_4 LDIST + \gamma LRTRADE_SAU_{t-1} + u_t \quad (1)$$

$$LCEFC_SAU = \theta_5 + \theta_6 EUDUM + \theta_7 GCCDUM + \theta_8 NONGCCOILPRDUM + \theta_9 ASIADUM + \theta_{10} LPOP_TP + \varepsilon_t \quad (2)$$

| 1997-2002: | OLS | | GMM |
|--|-----------------------|-----------------------|-----------------------|
| Dependent variable: LRTRADE_SAU | | | |
| LCEFC | 1.000 [0.009] | 0.846 (0.054) | 0.997 [0.012] |
| LPCRINC_SAU | 1.284 [0.284] | 1.417 (0.291) | -3.179 [3.318] |
| LPCRINC_TP | 0.091 [0.011] | 0.075 (0.013) | 0.091 [0.014] |
| LDISTANCE | 0.000 [0.021] | -0.002 (0.022) | -0.014 [0.043] |
| LRTRADE_SAU _{t-1} | | 0.152 (0.052) | |
| Dependent variable: LCEFC_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] |
| NONGCCOILPRDUM | 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] |
| <i>N</i> | 770 | 761 | 745 |
| \bar{R}_1^2 | 0.969 | 0.969 | 0.947 |
| \bar{R}_2^2 | 0.466 | 0.466 | 0.436 |
| <i>SER</i> ₁ | 0.319 | 0.319 | 0.413 |
| <i>SER</i> ₂ | 1.315 | 1.315 | 1.296 |
| Mean of LRTRADE_SAU | 19.755 | 19.773 | 19.773 |
| Mean of LCEFC_SAU | -0.050 | -0.050 | 0.019 |
| 2003-2007: | | | |
| | OLS | | GMM |
| Dependent variable: LRTRADE_SAU | | | |
| LCEFC | 1.000 [0.007] | 0.961 (0.049) | 1.008 [0.010] |
| LPCRINC_SAU | 1.532 [0.106] | 1.479 (0.132) | 1.588 [0.113] |
| LPCRINC_TP | 0.433 [0.010] | 0.416 (0.024) | 0.433 [0.010] |
| LDISTANCE | -0.000 [0.018] | -0.003 (0.018) | -0.001 [0.030] |
| LRTRADE_SAU _{t-1} | | 0.039 (0.049) | |
| Dependent variable: LCEFC_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] |
| NONGCCOILPRDUM | -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] |
| <i>N</i> | 645 | 644 | 642 |
| \bar{R}_1^2 | 0.981 | 0.981 | 0.981 |
| \bar{R}_2^2 | 0.504 | 0.504 | 0.471 |
| <i>SER</i> ₁ | 0.267 | 0.267 | 0.268 |
| <i>SER</i> ₂ | 1.351 | 1.351 | 1.399 |
| Mean of LRTRADE_SAU | 20.358 | 20.360 | 20.360 |
| Mean of LCEFC_SAU | -0.007 | -0.007 | -0.005 |
| GMM Instruments: LPCRINC_SAU _{t-1} , LPCRINC_TP _{t-1} , LRTRADE_SAU _{t-1} , LPOP_TP, LPOP_SAU, GCCDUM, EUDUM, ASIADUM, NONGCCOILPRDUM, 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.6: UNITED ARAB EMIRATES

$$LRTRADE_UAE_t = \theta_0 + \theta_1 LCEFC_UAE + \theta_2 LPCRINC_UAE_t + \theta_3 LPCRINC_TP_t + \theta_4 LDIST + \gamma LRTRADE_UAE_{t-1} + u_t$$

(1)

$$LCEFC_UAE = \theta_5 + \theta_6 EUDUM + \theta_7 GCCDUM + \theta_8 NONGCCOILPRDUM + \theta_9 ASIADUM + \theta_{10} LPOP_TP + \varepsilon_t$$

(2)

| 1997-2002: | OLS | | GMM |
|--|-----------------------|-----------------------|-----------------------|
| Dependent variable: LRTRADE_UAE | | | |
| LCEFC | 1.000 [0.008] | 0.794 (0.044) | 1.006 [0.014] |
| LPCRINC_UAE | 0.941 [0.170] | 0.888 (0.168) | 4.473 [0.659] |
| LPCRINC_TP | -0.226 [0.011] | -0.185 (0.015) | -0.229 [0.016] |
| LDISTANCE | -0.000 [0.021] | -0.001 (0.020) | -0.016 [0.021] |
| LRTRADE_UAE _{t-1} | | 0.205 (0.043) | |
| Dependent variable: LCEFC_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] |
| NONGCCOILPRDUM | 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] |
| <i>N</i> | 798 | 790 | 779 |
| \bar{R}_1^2 | 0.972 | 0.974 | 0.943 |
| \bar{R}_2^2 | 0.477 | 0.477 | 0.463 |
| <i>SER</i> ₁ | 0.319 | 0.310 | 0.461 |
| <i>SER</i> ₂ | 1.429 | 1.429 | 1.454 |
| Mean of LRTRADE_UAE | 19.240 | 19.249 | 19.249 |
| Mean of LCEFC_UAE | -0.007 | -0.007 | 0.008 |

| 2003-2007: | OLS | | GMM |
|--|----------------------|-----------------------|----------------------|
| Dependent variable: LRTRADE_UAE | | | |
| LCEFC | 0.999 [0.010] | 0.752 (0.056) | 0.995 [0.014] |
| LPCRINC_UAE | 2.005 [0.117] | 1.468 (0.167) | 1.863 [0.119] |
| LPCRINC_TP | 0.122 [0.012] | 0.091 (0.014) | 0.125 [0.011] |
| LDISTANCE | 0.000 [0.023] | -0.000 (0.022) | 0.056 [0.066] |
| LRTRADE_UAE _{t-1} | | 0.244 (0.054) | |
| Dependent variable: LCEFC_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] |
| NONGCCOILPRDUM | 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] |
| <i>N</i> | 664 | 663 | 661 |
| \bar{R}_1^2 | 0.969 | 0.971 | 0.968 |
| \bar{R}_2^2 | 0.494 | 0.494 | 0.479 |
| <i>SER</i> ₁ | 0.322 | 0.314 | 0.326 |
| <i>SER</i> ₂ | 1.253 | 1.253 | 1.276 |
| Mean of LRTRADE_UAE | 20.134 | 20.136 | 20.136 |
| Mean of LCEFC_UAE | 0.002 | 0.002 | 0.006 |

GMM Instruments: LPCRINC_UAE_{t-1}, LPRINC_TP_{t-1}, LTRADE_UAE_{t-1}, LPOP_TP, LPOP_UAE, GCCDUM, EUDUM, ASIADUM, NONGCCOILPRDUM, 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.1: 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 | |
| | | 1997-2002 | 2003-2007 | 1997-2002 | 2003-2007 |
| COUNTRY | Specification | | | | |
| 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 (0.275) | -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.2: 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 | |
| | | 1997-2002 | 2003-2007 | 1997-2002 | 2003-2007 |
| COUNTRY | Specification | | | | |
| 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.