WP/19/11

SAMA Working Paper:

The Impact of the Customs Union Agreement on GCC Bilateral Trade, using Aggregated and Disaggregated Data

December 2019

By
Sultan Alshammari, PhD

Economic Research Department
Saudi Arabian Monetary Authority

Impact of Customs Union Agreement on GCC Bilateral Trade, using Aggregated and Disaggregated Data

Sultan B. Alshammari[1]
Economic Research Department
July 2019

ABSTRACT

This paper studies different aspects of trade integration among Gulf Cooperation Council (GCC) member countries by examining the effect of the GCC Customs Union (GCC CU) on trade in the region during 1995-2012 period. Different forms and specifications of the gravity model of international trade are applied to a set of bilateral trade flows among 38 countries representing GCC countries and their major trade partners during the 1995-2012 period.

By investigating the effect of the GCC CU on aggregate and disaggregate trade, the findings of this paper have interesting implications. The use of disaggregated trade data is important in investigating the GCC CU, since the aggregate results may suffer from aggregation bias. In addition, it helps identify the sectors that benefit more from GCC CU, which is an important issue for GCC countries that seek the integration of their economies. The results of the disaggregated trade analysis suggest that the value added or advantage of GCC CU trade creation was more concentrated in sectors that exhibit lower shares of GCC intra-trade during 1995-2012.

Keywords: economic agreements, integration, gravity model, international trade.

JEL classification codes: C10, F15, F10.

[1] Contact Detail: Sultan B. Alshammari, email: salshammari@sama.gov.sa

Impact of Customs Union Agreement on GCC Bilateral Trade

1. Introduction:

The Cooperation Council for the Arab States of the Gulf (GCC), is a political and economic group of six members namely; Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates (UAE). The GCC was established in the Emirate of Abu Dhabi, Capital of UAE, on 25 May 1981. The union comprised of Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the UAE. The unified economic agreement among the countries of the GCC was signed on 11 November 1981 in Abu Dhabi with the aim of supporting their economic, social and political ties among the GCC member countries by harmonizing regulations in the fields related to the economies, finance, trade, customs and tourism, inspiring scientific & technical cooperation, and encouraging the cooperation of their mutual private sectors.

The similarities in political and cultural framework are favorable for the establishment of this unity among GCC members. The most important step of the GCC toward economic integration was achieved when the Unified Economic Agreement (UEA)[2] was agreed upon. The UEA was set to coordinate and standardize the economic, financial, monetary, commercial, industrial, and customs regulations among the members with the ultimate goal of introducing a unified currency for the GCC countries. The UEA stages in which the economic integration path would follow included the establishment of a free trade agreement in May 1981 by the signing of the Economic

[2] UEA has 28 articles, attached in the Appendix.

Agreement in November 1981. This agreement contained the main provisions of the GCC Free Trade Area. In 2001, the member's countries approved a revised version of the UEA and referred to as the New Economic Agreement (NEA). The new version sets goals for further integration in order to achieve full financial, monetary and other aspects of economic integration in order to introduce a common currency. The creation of a customs union began in 2003 and was completed and fully operational on 1 January 2015. On 1 January 2008 the six GCC countries declared the creation of a common market in the GCC region. In January 2015, the common market was further integrated, allowing full equality among GCC citizens to work in the government and private sectors, social insurance and retirement coverage, real estate ownership, capital movement, access to education,health and other social services in all member states. However, some barriers remained in the free movement of goods and services. The coordination of taxation systems, accounting standards, and civil legislation is currently in progress.The interoperability of professional qualifications, insurance certificates and identity documents is also underway.

Further to GCC CU, a Customs Union Authority was established on June 1, 2012, with the aim of completing the requirements of the Customs Union, which includes the mechanism of distribution of customs duties, customs protection, handling of American goods imported through the Kingdom of Bahrain and Oman, protection of the local agent, and unifying Customs procedures, and products of national factories in the free zones. The Customs Union Authority is entrusted with a timetable for the implementation of the

final stage of the Customs Union, in fully operational bases, by January 1, 2015.[3].

Almoulani (2016) claims that there are ongoing plans to strengthen the implementation of the customs union agreement. For this purpose-, the customs union must pass several remaining challenges, including development of a plan for the fair distribution of customs duties taking into account issues relating to the port of entry and final destination of goods. In 2008, the GCC countries' members established a common market with the ultimate aims of facilitating the movement of GCC citizens and capital among member states. The common market agreement emphasizes the free flows of factors of production among GCC member countries. The coverage planned for the common market includes several areas such as economic, investment, the stock market and the establishment of companies in both the public and private sectors included the provision for social insurance among GCC citizens. For a Currency Union (CU) to be achieved completely, there are elements that need to be attained. Trade integration is probably the most important step toward currency union, as members of the union gain from high levels of intra-trade after the establishment of a CU due to the elimination of exchange rate risk and transaction costs associated with multiple currencies.

This paper aims to examine to what extent bilateral trade of GCC countries are integrated by assessing the impact of the GCC Customs Union on aggregate trade among GCC countries by applying the gravity forms on GCC members' bilateral trade. The methodology is based on different models of gravity equations with the interaction of the importer/exporter effects and time

[3] This study focuses on the effect of Custom Union on aggregate trade among GCC members

effects model, the country pair effects and time effects model and importer effects and time effects, and exporter effects and time effects model to assess the impact between GCC FTA on trade among GCC countries. More details on these different models are provided in the methodology section. The empirical studies so far have not examined extensively the trade pattern in GCC countries especially the impact of custom union. Most of previous empirical research have focused mainly on the structure of foreign trade. Therefore, this paper provides an empirical study of gravity model and more broadly explore the GCC customs union. The current paper also aim to contribute for a more solid basis for future work on regional trade integration under trade agreements, by drawing concluding remarks on the general effect of trade laws and barriers. In addition, the paper documents the importance of custom unions to support the economic and trade integration. The following section provides a short literature review on empirical research has focused on the impact of Custiom union on the GCC. The rest of paper is structures as follows; Section 2 discusses the trade integration and the regional trade agreement. Section 3 provides an overview of the trade patterns of GCC countries. Section 4 discusses the problems related to the estimating the Gravity Equation. Section 5 presents the methodology, and Section 6 presents the data descriptions and results. Finally, the last section provides an overall conclusion.

2. Literature Review (Custom Union and Intra-Industry Trade)

There have been some attempts to measure the effect of free trade agreements on disaggregate trade data. In addition to estimating the impact of Euro on aggregate trade (exports), Flam and Nordström (2006) studied the impact of Euro on one-digit Standard International Trade Classification (SITC) sector

using gravity model-fixed effect. They have also aimed to explore the trade creation and Euro diversion effect of non-Euro partner. Their estimation shows that there are wider distribution and less economic meaningful results comparing to aggregate level.

Al-Shammari (2007) investigated the impact of the announcement of the establishment of a Customs Union among GCC member in 2000. He applied an exporter, importer and time effects gravity model with panel data of the bilateral trade for 196 countries from 1990 to 2005. In addition, he examined disaggregate trade data at the (1-digit level) among GCC members. The author concluded that the announcement of the establishment of a customs union among GCC counties had a positive impact on some sectors.

Boughanmi et al. (2010) investigated the effect of the GCC Free Trade Agreement on agri-food sectors in the period between 1990 and 2004 by applying the exporter and importer effects- gravity model- and pooled OLS to 2 –digit agri-food sectors. They concluded that the GCC Free Trade Agreement had a positive impact on the overall agri-food sector and a positive impact on trade among GCC countries in several 2-digit sectors such as dairy and meat preparatioin.

Abdmoulah (2011) attempted to examine whether the GCC Free Trade Agreement has a positive or negative impact on sectoral trade among GCC countries between 2000 and 2007. He applied a zero-ainflated negative binominal gravity model (exporter and importer effects) to solve the problem of a zero trade-in date. He concluded that, for most sectors, the GCC Free Trade Agreement had no significant effect on trade among GCC countries between 2000 and 2007.

Alawadhi (2014) investigated the impact of the GCC Free Trade Agreement on intra-industry trade among GCC countries using disaggregate trade data as he found that the use of aggregate level data might result in aggregation bias. In addition, he found that disaggregate data help to identify the sectors that benefit more from GCC Trade Agreement since GCC members are seeking diversification of their economies. He concluded that, under the GCC Trade Agreement, trade creation was more concentrated in sectors that exhibit lower shares of GCC intra-trade during the 1983-2010 period.

3. Overview of trade patterns among GCC countries

The GCC members are considered to be open economies, since trade flows within the GCC members (intra-trade) and between the GCC and the rest of the world have rapidly increased since the GCC was established in 1981. Trade flows among the GCC members when the Council was established were $8bn and the total trade flows with the rest of the world were $252.3bn. In 2003, trade flows increased to $23bn among GCC states. By 2008, this level of flows had reached $67 bn that amounted to about 5.9% of the region's total trade flows with the rest of the world. In 2012, intra-trade of the GCC jumped to around $100bn. The rapid increase in intra-trade of GCC over the last two decades is probably related to the establishment of the Customs Union and Common Market in 2003 and 2008 respectively (Bahrain's Ministry of Trade and Industry (BMTI), 2016).

According to BMTI, trade flows among the GCC countries as an economic bloc and the rest of the world have rapidly jumped over the last two decades as well. In 1984, the total trade of GCC countries with the rest of the world was $138bn and increased to $1.19 trillion in 2011.

4. Problems with the Gravity Equation model estimation.

The estimation of the log of the gravity equation faces several problems (Baier & Bergstrand, 2007). The main issues are;

4.1 Endogeneity Bias:

Endogeneity occurs when one or more of the right–hand-side (RHS) variables are correlated with the error term. Main sources of endogeneity bias of right-hand-side variables are:

4.1.1 Omitted Variable Bias (OVB) :

Baier & Bergstrand (2007) consider that the omitted variables bias is the major source of endogeneity when estimating the effects of CU in gravity equation. This omitted variable bias occurs in the case of a significant variable of trade not existing in the RHS of the gravity equation and this variable correlates with other variable or endogenous variable especially the CU dummy used in this study. Baier & Bergstrand suggest three methods to avoid omitted variable bias. The first mothed consist of including the omitted variable or variables. However, it is not always feasible to include all omitted variables, and it is hard to measure some variables or there might be a lack of data for these variables. The second method is to solve the OVB in including fixed effects; however, including fixed effects will account for most time invariant omitted variables, and will interact with time effects that also account for most time invariant omitted variables. The third method consists of the use of instrumental variables (IV). They are used in order to remove the correlation between the omitted independent variables with the error term that where the instrument variable is a determinant of at least one independent variable and

an omitted variable. The major task is to find an appropriate instrument variables.

According to Baier and Bergstrand (2007), the instruments should be correlated with the FTA variable or the CU variable, but not with the other factors causing trade between countries; this condition is very hard to find, and the author suggest the use of fixed effects to removes most of the omitted variables bias. This appears to be the best practical solution for omitted variable problems.

4.1.2 Simultaneity Bias and Reverse Causality (RC) Bias

When the impacts of a CU are measured by applying the gravity model, reverse causality origins from the fact that the effects of the CU are dependent on the level of trade between countries. In other words, the level of trade between countries might cause the countries to join a CU, and then the corresponding effects on trade may not be observed in the trade data of the trade levels between the CU members. Therefore, the larger trade between countries makes them more likely to form CU. A possible solution to reverse causality is to use instrumental variables.

4.1.3 Sample Selection Bias

When there is no bilateral trade between countries, sample selection problems occur. In another words, this bias occurs when data have zero trade flows. As a consequence, the gravity model is usually estimated in log-linear form. Indeed, the log of zero trade flows is undefined, which can result in forth problems in estimation. The standard practice in dealing with zero trade flows is to drop such observations. In this context, dropping zeros means that data are selected concerning the value of the dependent variable that and not treated

as missing observations; hence, the sample that is selected from the population is not random, thus biasing the OLS estimates. In this paper, the data have no zeros trade flow; thus, we will not face sample selection bias problems in the estimation of the gravity model.

5. Methodology

As discussed in the previous section, the estimation of the gravity model usually faces some problems. The best solution for OVB bias is to use the suggestion of Baier and Bergstrand (2007) and estimate the model using fixed effect estimation. In this paper, the estimation will be for different variations of two versions of the gravity model, the traditional gravity and the Anderson and van Wincoop (AvW) (1997), gravity equation; both versions are estimated via OLS. The advantage of using the AvW model is to eliminate any reverse causality (RC) that may occur in the regression between GDP and export trade. Since the model does not incorporate the inclusion of GDP per capita, it is necessary to augment different versions of the gravity equation with GDP per capita. Fortunately, the use of exporter-time and importer-time effects removes the need to include GDP or GDP per capita, since the estimation results for GCC CU are qualitatively the same whether including GDP and GDP per capita, including one of them or omitting both. In addition, time dummies are added for each year, these dummies control for variables such as globalization or shocks that affect the world economy. With large N=38 and small T=18, it is a good idea to allow for separate intercepts for each period. Doing so allows for aggregate time effects that have the same influence on all exporters (Wooldridge, 2001). The use of fixed effects helps to correct for omitted variables, especially multilateral resistance (Anderson and Van Wincoop ,2003). With fixed effects estimation, the study uses both

the traditional and the AvW gravity models, where instead of solving internally for multilateral resistance the study uses exporter and importer fixed effects to account for it. It also uses the fixed effects instead of random effects in the light of the suggestions of Egger (2000), Rose (2005), Baier and Bergstrand (2007) and Shepherd (2008). According to Egger (2000), the use of fixed [4] effects is more appropriate when trade flows are estimated for a set of countries that are selected, while random effects usage is more appropriate when the countries are selected randomly. In case it is not clear which one should be used, fixed effects are consistent while random effects are not. Furthermore, the fixed effects method has less restrictive assumption compared with random effects (Shepherd, 2008).

Exporter and importer effects are used to control for all unobservable time invariant country effects, and the time effects are used to control for all unobservable effects that are time variant and that affect all exporters and importers. In addition, the country pair effects are added to control for almost all possible unobservable interaction effects between exporter and importer. Finally, the interaction between importer effects and time effects, and exporter effects and time effects are added to control for almost all possible interactions between country specific effects and time effects[5].

[4] Equations 1, 2, 3, 4, and 5 illustrate different types of fixed effects that will be applied to the data.

[5] These include time variation in multilateral resistance terms.

For the importer/exporter effects and time effects model, the following equation will be applied:

$$\ln X_{ijt} = \theta_t + \Upsilon_j + \sigma_i + \beta_0 + \beta_1 lnGDP_{it} + \beta_2 lnGDP_{jt} + \beta_3 lnPOP_{it} + \beta_4 lnPOP_{jt} + \beta_5 \text{CU} + \beta_6 lndis + \beta_7\, lang + \beta_8 bord + \beta_9\, GCC + U_{ijt} \quad \ldots\ldots 1$$

In AvW gravity equation form:

$$ln\frac{X_{ijt}}{GDP_{it}GDP_{jt}} = \pi_t + \Omega_j + \boldsymbol{\lambda}_i + \alpha_0 + \alpha_1 lnPOP_{it} + \alpha_2 lnPOP_{jt} + \alpha_3 \text{CU} + \alpha_4 lndis + \alpha_5\, lang + \alpha_6 bord + \alpha_7\, GCC + \text{R}_{ijt} \quad \ldots\ldots 2$$

For the country pair effects and time effects model, the following equation will be applied:

$$\ln X_{ijt} = \theta_t + \sigma_i \Upsilon_j + \beta_0 + \beta_1 lnGDP_{it} + \beta_2 lnGDP_{jt} + \beta_3 lnPOP_{it} + \beta_4 lnPOP_{jt} + \beta_5 \text{CU} + \beta_6 lndis + U_{ijt} \quad \ldots\ldots 3$$

In AvW gravity equation form

$$ln\frac{X_{ijt}}{GDP_{it}GDP_{jt}} = \pi_t + \boldsymbol{\lambda}_i \Omega_j + \alpha_0 + \alpha_1 lnPOP_{it} + \alpha_2 lnPOP_{jt} + \alpha_3 \text{CU} + \alpha_4 lndis + \text{R}_{ijt} \quad \ldots\ldots 4$$

$\mathbf{X_{ijt}}$: Exports from country i to country j at time t

$\boldsymbol{GDP_{it}}$: GDP of country i at time t;

$\boldsymbol{GDP_{jt}}$: GDP of country j at time t;

$\boldsymbol{POP_{it}}$: Population of country i at time t;

$\boldsymbol{POP_{jt}}$: Population of country j at time t;

$\boldsymbol{Dis_{ij}}$: Distance between country i and country j;

GCC : A dummy that takes the value of one if both countries are GCC members at time t, and zero otherwise;

CU : A dummy that takes value of one if both countries are members of a preferential trade agreement at time t, and zero otherwise;

Bord : A dummy that takes a value of one if country i and country j share a border and zero otherwise;

Lang : A dummy that takes a value of one if country i and country j share the same official language and zero otherwise

$\boldsymbol{\theta_t}$: Time effects;

$\boldsymbol{\Upsilon_j}$: Importer fixed effects;

$\boldsymbol{\sigma_i}$: Exporter fixed effect;

$\boldsymbol{\sigma_i \Upsilon_j}$: Country pair fixed effects;

$\boldsymbol{\pi_t}$: Time effects;

$\boldsymbol{\lambda_i \Omega_j}$: Country pair fixed effects;

In equations 1 and 2, exporter and importer effects are used to control for all unobservable time invariant country effects, and the time effects are used to control for all unobservable effects that are time variant and affect all exporters and importers.

In equations 3 and 4, the country pair effects are the interaction between importer effects and exporter effects that are replaced instead of all the time invariant variables For country pair effects, a two way model is applied and assumes that $\sigma\Upsilon \neq \Upsilon\sigma$. According to Egger and Pfaffermayr (2003), this is identical to a triple way model (including , Υ and σ Υ). In the two-way model, country pair effects are allowed to differ depending on the direction of trade. However, in the one-way model the country pair effects are allowed to have

the same impact on trade between a country pair regardless of the direction of trade. The application of two-way model is that costs of transportation may differ according to the direction, which the countries are exporters or importers.

The CU dummy takes the value of one from 2003 onwards because in 2003 the GCC members signed Custom Union Agreement. Anderson and Van Wincoop (2003), recommend using fixed effects for empirical estimation as a more practical way. It is for this reason that the fixed-effects approach is used in this paper.

6. Data Description and Results

6.1. Data

The data used in the gravity model in this paper are;

Exports: Annual data for period 1995-2012 representing the values of exports between 38 countries[6] (including GCC countries). These countries were chosen because they are the major trade partner with GCC countries for the ten trade sectors at the 1-digit aggregation level of the Standard International Trade Classification (SITC),

Sector 0 - Food and live animals

Sector 1 - Beverages and tobacco

Sector 2 - Crude materials, inedible, except fuels

Sector 3 - Mineral fuels, lubricants and related materials

Sector 4 - Animal and vegetable oils, fats and waxes

Sector 5 - Chemicals and related products

[6] The list of countries is attached in the end of the paper.

Sector 6 - Manufactured goods classified chiefly by material

Sector 7 - Machinery and transport equipment

Sector 8 - Miscellaneous manufactured articles

Sector 9 - Commodities and transactions not classified elsewhere in the SITC

The values of exports are measured in current US dollars and were obtained from the UN Comtrade database. Time and country dummies account for inflation, so as indicated by Baldwin and Taglioni (2006) there is no need to deflate exports. Mirror exports data are used rather than exports as they provide more observations for GCC countries. In other words, the imports value are used instead of the exports values, where the exports of country A to country B are estimated as the imports of country B from country A. The reasons behind using this method are; there are many missing export data for GCC members, but fewer missing is that value when using imports data. Countries, in general, tend to report their imports data more accurately than their exports since they apply duties on imports.

GDP: annual data from 1995-2012 for 38 countries including GCC countries at US constant prices, the data were obtained from the World Bank database[7].

Population: annual data from 1995-2012 for 38 countries including GCC countries, the data were obtained from the World Bank database[8].

Distance: obtained from CEPII distance database[9] in kilometers. According to this database "distances are calculated following the great circle formula, which uses latitudes and longitudes of the most important cities/agglomerations (in terms of population) for the dist variable incorporate

[7] *http://data.worldbank.org/data-catalog/GDP-ranking-table*
[8] *http://data.worldbank.org/indicator/SP.POP.TOTL*
[9] *http://www.cepii.fr/CEPII/en/bdd_modele/presentation.asp?id=6*

internal distances based on areas" and google earth software is used to measure the distance.

Data on dummy variables were obtained from the CEPII geographic database except for the CU variable that was obtained from the Database on Economic Integration Agreements constructed by Scott Baier and Jeffrey Bergstrand.

6.2 Results

6.2.1. Aggregated data level

Two Specifications of fixed effects are utilized. While the first specification analyzes importer, exporter and time effects, the second specification analyzes country pair and time effects.

First are the results of the time, exporter and importer fixed effects model shown in columns (1) and (2) of table 1. The first column presents the results for the traditional gravity equation and the second column presents the results for the AvW gravity equation. All coefficients in the gravity equations show the expected signs[10] except for the Border dummy and custom union dummy coefficients that turned out to be negative.

The exporter GDP coefficient value is 1.0 for model (1); this suggests that a one percent increase in exporter GDP was associated with a one percent increase in exports from country i to country j during 1995-2012. The Importer GDP coefficient value is 0.01 for model (1); this suggests that a 1 percent increase in importer GDP is associated with a 0.01 percent increase in exports from country i to country j during the 1995-2012 time period. The exporter population coefficient value is 0.22 for model (1) and 0.28 for model (2), which indicates that a 1 percent increase in exporter population is

[10] *All coefficients are expected to have positive signs except distance that is expected to have a negative sign.*

associated with increase of 0.2 and 0.28 percent respectively in exports from country i to country j. The Importer population's estimate is 0.25 for both model (1) and model (2), which suggest that a 1 percent increase in importer population is associated with a 0.25 percent increase in exports from country i to country j during 1995-2012. Distance impact does not change with specifications; it is equal to -0.54 for both models, which means that on average an exporter exported 0.54 percent less to an importer that has almost twice the distance of another importer during the 1995-2012 period.

The border impact is -0.44 for the model (1) and -0.35 for model (2). That result suggests exporter country exports 55 and 42 percent for model (1) and (2) respectively less to the Importer and that shares a border. Model (1) suggests that sharing a common language between any two countries increases exports on average by 100(e^3.88-1) percent. However, the results of model (2) suggest that sharing a common language between any two countries increases exports from country i to country j on average by 100(e^0.18-1) percent. The variable GCC has a significant coefficient with estimates of 2.73 and 0.68 for models (1) and (2), respectively, which suggests that GCC has an impact on trade among GCC countries during 1995-2012. In other words, if the two countries are both GCC members this would increase exports by 100*(e^2.7 -1) and 100*(e^0.68-1). The variable of interest CU exhibits insignificant estimated coefficients with values of -0.37 and-0.78 for models (1) and (2) respectively, which suggests that the GCC CU does not exert an impact on trade among GCC countries. The regional bloc is expected to have a significant positive effect on intra-trade but the coefficient of CU dummy had insignificant value.

The results of the second are shown in columns (3) and (4) of the table 1.2. By using country pair effects, all time invariant variables are dropped from

the regression, where the pair effect replaces them. The advantage of using country pair effects instead of importer/exporter effects are that there should not be a concern about the appropriate measure of distance between countries and the inclusion of any other shared characteristics between trade partners (such as similarities in legal systems) that are time invariant.

The exporter GDP coefficient value is 1 for model (3), suggesting that a one percent increase in exporter GDP is associated with 1 increase in exports from country i to country j during 1995-2012. The importer GDP coefficient value is 0.54 for model (3) suggesting that a one percent increase in importer GDP is associated with 0.54 percent increase in exports. Exporter population coefficient value is 0.26 and 0.30 for model (3) and (4) respectively this suggests that 1 percent increase in exporter population was associated with 0.26 and 0.30 percent increase in exports. Importer Population coefficient value is 0.25 and 0.22 for model (3) and (4) respectively. This indicates that a 1-percent increase in importer population is associated with 0.25 and 0.22 percent increase in exports from country i to country j respectively. The CU coefficient values are -0.59 and -0.77 for models (3) and (4) respectively; this implies that during the 1995-2012 time period in general for all of the countries' trade agreements among member countries decreased trade by 100*(e^0.59-1) and 100*(e^0.77-1) during the 1995-2012 time period percent according to models (3) and (4) respectively. The dummy of one cu CU which takes the value of one if one country is a member of the Custom Union agreement and other country is not a member (otherwise the value is zero), had positive and significant value (0.5) in both models (3) and (4) which suggests that there is no trade diversion.

6.2.2 Disaggregated data level

The fixed effects specifications are applied for each sector; the first includes importer, exporter and time effects, the second includes country pair and time effects, and the third includes the previous two effects along with the interaction of time and exporter effects and the interaction of time and importer effects.

The results of the gravity model augmented with exporter, importer and time effects suggest that the GCC CU resulted in trade creation among GCC countries during the 1995-2012 period in sectors of Food and live animals, Beverages and tobacco, Crude materials, inedible, except fuels, Animal and vegetable oils, fats and waxes, Manufactured goods classified chiefly by material, Machinery and transport equipment and Miscellaneous manufactured articles with the highest trade increase attributed to sector of Manufactured goods classified chiefly by material (405 percent in the AvW specification). The results of the gravity model augmented with country pair and time effects suggest that the GCC FTA resulted in trade creation among GCC countries during 1995- 2012 period in sectors of Food and live animals, Beverages and tobacco, Crude materials, inedible, except fuels, Animal and vegetable oils, fats and waxes , Chemicals and related products, Manufactured goods classified chiefly by material and Commodities and transactions not classified elsewhere in the SITC for the traditional gravity model and sectors of Food and live animals, Crude materials, inedible, except fuels, Animal and vegetable oils, fats and waxes , Chemicals and related products, Manufactured goods classified chiefly by material, Machinery and transport equipment, Miscellaneous manufactured articles and Commodities and transactions not classified elsewhere in the SITC for the AvW gravity model with the highest trade increase in sector of Animal and vegetable oils, fats and waxes. Finally,

the results of the gravity model augmented with exporter-time, importer-time and country pair effects suggest that GCC CU resulted in trade creation among GCC countries during the 1995-2012 time period in sectors of Food and live animals, Crude materials, inedible, except fuels, Mineral fuels, lubricants and related materials, Animal and vegetable oils, fats and waxes, Machinery and transport equipment and Commodities and transactions not classified elsewhere in the SITC with the highest trade increase in sector of Animal and vegetable oils, fats and waxes.

Comparing the results from table 3 to table 12 which include country pair effects and time effects with the results that use country pair effects and exporter/importer-time effects, one can see that difference in the coefficient of GCC CU for aggregate trade is small (going from 0.73 to 0.9) while the effect of GCC CU changes significantly in sectors Food and live animals, Crude materials, inedible, except fuels, Mineral fuels, lubricants and related materials, Chemicals and related products, Manufactured goods classified chiefly by material and Commodities and transactions not classified elsewhere in the SITC with the most significant changes in sectors Mineral fuels, lubricants and related materials, Chemicals and related products and Manufactured goods classified chiefly by material. The main reason behind this is that the appropriate measure of economic size for the exporting and importing countries at the aggregate level is the GDP of the exporting and importing countries. For latter model the data on value added and expenditure are not available and GDP is used as an alternative since the model from table 3 for exporter-time and importer-time effects account for the effects of value added and expenditure at the disaggregate level of trade.

7 Conclusion

Estimating the log of gravity equation faces several econometric issues such as endogeneity bias. The omitted variables bias is the major source of endogeneity when estimating the effects of Customs Union (CU) in gravity equation. The obvious solution would be to include the omitted variable or variables. However, it is impossible to include all omitted variables. The way to correct (OV) bias is that including fixed effects.

Baier and Bergstrand (2007) suggest that using fixed effects removes most of the omitted variables bias; thus, it is the best practical solution for omitted variables problems. Reverse Causality (RC) Bias is another problem that may face when estimating the log of the gravity model. A possible solution for reverse causality is to use instrument variable (IV).

In addition, sample selection bias occurs if the data have zero trade flows. Because of this the gravity model is usually estimated in a log-linear model, the log of zero trade flows are undefined that lead to make problems in estimation. In this paper the data have no zeros trade flow, so we will not face sample selection bias problems in the estimation of the gravity model. A dummy variable was included in all models to assess the impact of GCC CU on GCC intra-trade at the aggregate level during the 1995-2012 period. The traditional gravity and the AvW gravity equation are applied; both versions are estimated via OLS. The advantage of using the AvW model is to eliminate any reverse causality (RC) that may occur in the regression between GDP and trade (exports). Since the model does not incorporate the inclusion of GDP per capita, it is not necessary to augment different versions of the gravity equation with GDP per capita.

Fortunately, the use of exporter-time and importer-time effects removes the need to include GDP or GDP per capita (the results for GCC CU are the same whether including GDP and GDP per capita, including one of them or omitting both). In addition, time dummies are added for each year, these dummies control for variables such as globalization or shocks that affect the world economy. With large N and small T, it is a good idea to allow for separate intercepts for each period.

For traditional Gravity Model, three different model applied, the first model is the importer/exporter effects and time effects model, exporter and importer effects are used to control for all unobservable time invariant country effects, and the time effects are used to control for all unobservable effects that are time variant that effects all exporters and importers. Second, The country pair effects and time effects model: the country pair effects are the interaction between importer effects and exporter effects that are replaced in instead of all the time invariant variables for country pair effects. A two way model is applied that assumes where according to Egger and Pfaffermayr (2003) this is identical to a triple way model (including , Y and σ Y).

The empirical studies so far have not examined extensively the trade patterns in GCC countries especially the gravity model. Most of previous empirical research have focused mainly on gravity model in United States and, to lesser extent, European Countries.

Therefore, this paper provides an empirical study on impact of GCC custom union on its trade flows and more broadly explore the GCC custom unions and trade pattern as well. The current paper also aim to contribute for a more

solid basis for future work on gravity model for GCC countries, by drawing concluding remarks on the general pattern and indicators of trade flows.
In addition, the paper documents the importance of trade agreements to influence the bilateral trade relation. In this paper, different specifications and variations of the gravity model of international trade have been applied to a set of bilateral exports between GCC countries and 38 trading partners (including GCC inter-country trade) for the period 1995-2012.

This paper attempt to answer the question of whether the Customs Union Agreement (2003) provide an evidence of trade diversion and trade creation in GCC members. The gravity model on aggregated level suggested that GCC Custom Union had insignificant values that may be caused by using aggregate data, according to Anderson and Yotov (2010), aggregation of trade data can bias gravity results.

However, the results of disaggregated data suggest that the GCC CU has resulted in trade creation in sectors of Food and live animals, Crude materials, inedible, except fuels, Mineral fuels, lubricants and related materials, Animal and vegetable oils, fats and waxes, Machinery and transport equipment and Commodities and transactions not classified elsewhere in the SITC with the largest effects in sectors of Mineral fuels, lubricants and related materials, Animal and vegetable oils, fats and waxes and Commodities and transactions not classified elsewhere in the SITC.

These results confirm the weak positive effect attributed to aggregate trade. The sectors where GCC CU was more effective had very low shares of aggregate GCC intra-trade (the sectors with positive coefficients represent

about 43 percent of GCC trade during the 2003-2007 period). In addition, the results of this paper suggest that GCC CU has resulted in trade creation among GCC countries in sector of Commodities and transactions not classified elsewhere in the SITC only from the year 1998.

References List

ABU-QARN, A., & ABU-BADER, S. (2008). On the optimality of A GCC Monetary Union: Structural VAR, Common Trends, and Common Cycles Evidence. The World Economy, 31(5), 612-630

AITKEN, N. D. (1973). The Effect of the EEC and EFTA on European Trade: A Temporal Cross-Section Analysis. The American Economic Review, 63, 881-892.

ALATRASH, H. & YOUSEF, T. (2000). Intra-Arab trade: is it too little? IMF Working Papers. International Monetary Fund.

ALAWADHI, A. S. (2014). Essays On Trade Integration among the Gulf Cooperation Council Countries. Doctoral, University Of Southampton.

ALJARRAH, M. A. (2010). Determinants of International Trade Flow for the GCC Countries and its Trade Partners: A Gravity Model Analysis. Arab Journal of Administrative Sciences, 17, 7-27.

ALSADOUN, N. A. (2009). Essays On Economic Integration among The Gulf Cooperation Council Countries. Doctoral, University Of Southampton.

ALSHAMMARI, N. N. (2007). Exchange Rate Policy and International Trade Linkages and Impacts. Doctor of Philosophy (Phd) Doctoral, Syracuse University.

ALTURKI, F. (2007). Essays on Optimum Currency Area. PhD. Thesis, Department of Economics, University of Oregon, USA

ANDERSON, J. E. & VANWINCOOP, E. (2001). Borders, Trade and Welfare. National Bureau of Economic Research.

ANDERSON, J. E. & VANWINCOOP, E. (2003). Gravity with Gravitas: A Solution to the Border Puzzle. American Economic Review, 93, 170-192.

ANDERSON, J. E. & VANWINCOOP, E. (2004). Trade Costs. Journal of Economic Literature, 42, 691-751.

ANDERSON, J. E. & YOTOV, Y. V. (2010). The Changing Incidence of Geography. American Economic Review, 100, 2157-2186.

ANDERSON, J. E. (1979). A Theoretical Foundation for the Gravity Equation. The American Economic Review, 69, 106-116.

APPLEYARD, D. F. & COBB, A. (2005). International Economics, McGraw-Hill.

BAIER, S. L. & BERGSTRAND, J. H. (2007). Do Free Trade Agreements Actually Increase Members' International Trade? Journal of International Economics, 71, 72-95.

BALASSA, B. (1961). The Theory of Economic Integration. London: Allen & Unwin.

BALDWIN, R. & TAGLIONI, D. (2006). Gravity for Dummies and Dummies for Gravity Equations. National Bureau of Economic Research Working Paper Series.

BERGSTRAND, J. H. 1989. The Generalized Gravity Equation, Monopolistic Competition, and the Factor-Proportions Theory in International Trade. The Review of Economics and Statistics, 143-153.

DEARDORFF, A. (1998). Determinants of Bilateral Trade: Does Gravity Work In A Neoclassical World? The Regionalization of the World Economy. University Of Chicago Press.

LAABAS, B. & IMED, L. (2002). Are GCC Countries Ready for Currency Union? API Working Paper series 0203.

LAMBERT, D. & MCKOY, S. (2009). Trade Creation and Diversion Effects of Preferential Trade Associations on Agricultural and Food Trade. Journal of Agricultural Economics, 60, 17-39.

LIPSEY, R. G. (1957). The Theory of Customs Union: Trade Diversion and Welfare. Economica, 24: 40-46.

MADDALA, G.S. (1992). Introduction to Econometrics. Second Edition. New Jersey:

ROSE, A. K. (2000). One money, one market: the effect of common currencies on trade. Economic policy, 15, 7-46.

ROSE, A. K. (2005). Does The WTO Make Trade More Stable? Open Economies Review, 16, 7-22.

TINBERGEN, J. (1962). Shaping the World Economy; Suggestions for an International Economic Policy. New York: Twentieth Century Fund.

VINER, J. (1950). The Customs Union Issue, New York Studies in the Administration of International Law and Organization. Volume 10.

WANG, Z.K., WINTERS, L.A. (1991). The Trading Potential of Eastern Europe, CEPR Discussion Paper 610.

WOOLDRIDGE, J. M. (2001). Econometric Analysis of Cross Section and Panel Data, MIT Press.

WORLD BANK. (2017). Economic Integration in the GCC. The World Bank. https://data.worldbank.org. [Accessed 13 October. 2017].

WORLD TRADE ORGANISATION. (2017). Available at https://www.wto.org/english/res_e/statis_e/statis_e.htm. [Accessed 20 December. 2017].

Table 1 Regression Results: Time, Exporter and Importer Fixed Effects

Variable	1	2
GDPExporter	**1.0**	**----**
	(0.00)	
GDPImporter	**0.01**	**----**
	(0.09)	
popexporter	**0.22**	**0.28**
	(0.07)	**(0.08)**
popImporter	**0.25**	**0.27**
	(0.4)	**(0.3)**
Distance	**-0.54**	**-0.54**
	(0.00)	**(0.00)**
CUS	**-0.37**	**-0.78**
	(0.78)	**(0.78)**
Border	**-0.44**	**-0.35**
	(0.01)	**(0.01)**
Language	**3.88**	**0.18**
	(0.01)	**(0.01)**
GCC	**2.73**	**0.68**
	(0.00)	**(0.00)**
OneUC	**0.40**	**0.38**
	(0.00)	**(0.00)**
R-Square	**0.7528**	**0.6775**
Observations	**3802**	**3802**
	F(17, 3736) = 4.68	**F(17, 3738) = 7.25**
	Prob > F = 0.0000	**Prob > F = 0.0000**

Note: column 1 represents regression results of time, exporter and importer effect by using McCallum's equation, and column 2 represents regression results of time, exporter and importer effect by using Anderson and van Wincoop's equation.

Table 2: Regression Results: Country pair and time effects

Variable	3	4
GDPExporter	**1.0**	**----**
	(0.00)	
GDPImporter	**0.54**	**----**
	(0.01)	
popexporter	**0.26**	**0.30**
	(0.04)	**(0.03)**
popImporter	**0.25**	**0.22**
	(0.00)	**(0.00)**
Distance	**----**	
CUS	**-0.59**	**-0.77**
	(0.59)	**(0.78)**
Border	**----**	**----**
Language	**----**	**----**
GCC	**----**	**----**
OneUC	**0.50**	**0.49**
	(0.66)	**(0.42)**
R-Square	**0.8731**	**0.8491**
Observations	**3802**	**3802**
	F(17, 3564) = 8.53	**F(17, 3566) = 13.95**
	Prob > F = 0.0000	**Prob > F = 0.0000**

Note: column 3 represents regression results of country pair and time effects by using McCallum's equation, and column 4 represents regression results of country pair and time effects by using Anderson and van Wincoop's equation.

Table 3: Regression Results; Sector 0

Variable/Model	1	2	3	4
GDPExporter	1.03	----	1.05	----
	(0.00)		(0.06)	
GDPImporter	0.42	----	0.18	----
	(0.01)		(0.01)	
popexporter	2.56	0.28	0.26	0.17
	(0.07)	(0.06)	(0.04)	(0.00)
popImporter	0.78	0.26	0.24	0.26
	(0.04)	(0.03)	(0.03)	(0.01)
Distance	-0.83	-0.84	_ _	_ _
	(0.00)	(0.01)		
CUS	0.72	0.77	0.60	0.70
	(0.01)	(0.01)	(0.77)	(0.78)
Border	-0.97	-0.45	_ _ _	----
	(0.00)	(0.10)		
Language	3.10	2.9	_ _ _	----
	(0.07)	(0.09)		
GCC	3.11	0.68	_ _ _	----
	(0.03)	(0.03)		
OneUC	-5.19	-0.38	-5.26	-0.17
	(0.00)	(0.00)	(0.46)	(0.42)
R-Square	0.6146	0.5993	0.7370	0.5803
Observations	3867	3871	3867	3871
	F(17,3801)=21.34 Prob > F= 0.0000	F(17,3807)=24.99 Prob > F=0.0000	F(17,3629)=32.00 Prob > F =0.0000	F(17,3635)=30.04 Pro >F=0.0000

Note: column 1and 2 represents regression results of time, exporter and importer effect for sector (0) by using McCallum's equation, and Anderson and van Wincoop's equation respectively. Column 3 and 4 shows regression results of country pair and time effects for sector (0) by using McCallum's equation and Anderson and van Wincoop's equation respectively.

Table 4: Regression Results: Sector 1

Variable/Model	1	2	3	4
GDPExporter	0.30	----	0.36	----
	(0.08)		(0.06)	
GDPImporter	0.63	----	0.44	----
	(0.01)		(0.01)	
popexporter	1.10	-0.87	1.10	0.90
	(0.07)	(0.06)	(0.04)	(0.10)
popImporter	0.10	0.04	0.03	0.10
	(0.05)	(0.03)	(0.07)	(0.09)
Distance	-0.60	-0.50	_ _	_ _
	(0.02)	(0.03)		
CUS	0.70	0.40	0.20	0.34
	(0.03)	(0.09)	(0.01)	(0.06)
Border	-1.72	2.80	----	----
	(0.00)	(0.10)		
Language	1.10	1.00	----	----
	(0.07)	(0.09)		
GCC	1.80	1.80	----	----
	(0.06)	(0.06)		
OneUC	-5.42	2.11	-8.61	7.50
	(0.00)	(0.00)	(0.01)	(0.00)
R-Square	0.5882	0.5622	0.7891	0.6608
Observations	3867	3871	3867	3871
	F(17,3801)= 20.15	F(17,3807)=22.65	F(17,3629)=32.30	F(17,3635)=31.50
	Prob > F= 0.0000	Prob > F = 0.0000	Prob > F =0.0000	Prob > F = 0.0000

Note: column 1and 2 represents regression results of time, exporter and importer effect for sector (1) by using McCallum's equation, and Anderson and van Wincoop's equation respectively. Column 3 and 4 shows regression results of country pair and time effects for sector (1) by using McCallum's equation and Anderson and van Wincoop's equation respectively.

Table 5: Regression Results: Sector 2

Variable/Model	1	2	3	4
GDPExporter	0.60	----	0.60	-----
	(0.04)		(0.06)	
GDPImporter	0.70	----	0.50	-------
	(0.01)		(0.02)	
popexporter	-1.69	-0.38	1.80	1.90
	(0.07)	(0.06)	(0.00)	(0.00)
popImporter	0.30	0.50	-0.50	1.90
	(0.04)	(0.01)	(0.03)	(0.01)
Distance	-0.30	-0.30	_ _	_ _
	(0.02)	(0.03)		
CUS	-1.70	-1.90	0.20	_ _
	(0.01)	(0.01)	(0.00)	
Border	-1.05	0.07	_ _ _	_ _
	(0.04)	(0.10)		
Language	1.10	1.00	_ _ _	----
	(0.04)	(0.01)		
GCC	0.30	0.30	_ _ _	--------
	(0.03)	(0.03)		
OneUC	-2.39	-1.07	-6.11	----
	(0.00)	(0.00)	(0.06)	
R-Square	0.5962	0.5s399	0.5932	0.6222
Observations	3867	3871	3867	3871
	F(17,3801)= 31.92	F(17,3807)= 38.44	F(17,3629) = 53.75	F(17,3635)=47.90
	Prob > F = 0.0000	Prob > F = 0.0000	Prob > F = 0.0000	Prob > F = 0.0000

Note: column 1and 2 represents regression results of time, exporter and importer effect for sector (2) by using McCallum's equation, and Anderson and van Wincoop's equation respectively. Column 3 and 4 shows regression results of country pair and time effects for sector (2) by using McCallum's equation and Anderson and van Wincoop's equation respectively.

Table 6: Regression Results: Sector 3

Variable/Model	1	2	3	4
GDPExporter	0.50	----	0.50	----
	(0.00)		(0.06)	
GDPImporter	0.30	----	0.50	----
	(0.01)		(0.01)	
popexporter	1.70	0.60	0.70	0.60
	(0.07)	(0.06)	(0.04)	(0.00)
popImporter	0.31	0.40	0.40	0.40
	(0.04)	(0.03)	(0.03)	(0.04)
Distance	-0.40	-0.40	_ _	_ _
	(0.02)	(0.02)		
CUS	0.20	-0.20	0.20	0.20
	(0.04)	(0.04)	(0.77)	(0.00)
Border	-2.90	-0.60	_ _ _	_ _
	(0.09)	(0.10)		
Language	2.50	6.80	_ _ _	_ _
	(0.04)	(0.01)		
GCC	0.70	0.70	_ _ _	_ _
	(0.01)	(0.01)		
OneUC	1.50	2.1	2.14	3.40
	(0.00)	(0.00)	(0.06)	(0.42)
R-Square	0.5957	0.5414	0.7265	0.6161
Observations	3867	3871	3867	3871
	F(17,3801)=31.09	F(17,3807)=20.71	F(17,3629)=56.24	F(17,3635)=27.58
	Prob > F= 0.0000	Prob > F = 0.0000	Prob > F = 0.0000	Prob > F = 0.0000

Note: column 1and 2 represents regression results of time, exporter and importer effect for sector (3) by using McCallum's equation, and Anderson and van Wincoop's equation respectively. Column 3 and 4 shows regression results of country pair and time effects for sector (3) by using McCallum's equation and Anderson and van Wincoop's equation respectively.

Table 7: Regression Results: Sector 4

Variable/Model	1	2	3	4
GDPExporter	0.70		0.60	----
	(0.03)		(0.06)	
GDPImporter	0.30		0.10	----
	(0.01)		(0.02)	
popexporter	1.10	0.20	1.10	0.20
	(0.05)	(0.06)	(0.04)	(0.00)
popImporter	0.10	0.20	0.20	0.30
	(0.07)	(0.03)	(0.03)	(0.01)
Distance	-1.10	0.80	_ _	_ _
	(0.00)	(0.02)		
CUS	1.50	0.60	1.70	0.30
	(0.01)	(0.01)	(0.03)	(0.78)
Border	-1.10	0.80	_ _ _	--
	(0.00)	(0.10)		
Language	4.60	4.60	_ _ _	----
	(0.07)	(0.09)		
GCC	2.30	2.30	_ _ _	----
	(0.01)	(0.03)		
OneUC	-5.73	3.13	-9.08	5.63
	(0.00)	(0.00)	(0.02)	(0.07)
R-Square	0.5362	05244	0.6655	0.6445
Observations	3,867	3,871	3,867	3,871
	F(17,3801)= 11.67	F(17,3807)=11.83	F(17,3629) = 18.96	F(17,3635)= 52.42
	Prob > F = 0.0000	Prob > F = 0.0000	Prob > F = 0.0000	Prob > F = 0.0000

Note: column 1and 2 represents regression results of time, exporter and importer effect for sector (4) by using McCallum's equation, and Anderson and van Wincoop's equation respectively. Column 3 and 4 shows regression results of country pair and time effects for sector (4) by using McCallum's equation and Anderson and van Wincoop's equation respectively.

Table 8: Regression Results: Sector 5

Variable/Model	1	2	3	4
GDPExporter	1.10	---	1.10	---
	(0.00)		(0.06)	
GDPImporter	0.40	----	0.40	----
	(0.04)		(0.01)	
Popexporter	0.70	0.3	0.70	0.30
	(0.03)	(0.06)	(0.04)	(0.00)
popImporter	0.50	0.3	0.10	0.40
	(0.08)	(0.03)	(0.03)	(0.01)
Distance	-0.90	0.3	----	----
	(0.07)	(0.01)		
CUS	0.20	1.1	0.30	1.20
	(0.05)	(0.01)	(0.77)	(0.78)
Border	-1.91	-0.03	_ _ _	----
	(0.08)	(0.10)		
Language	3.00	6.0	_ _ _	----
	(0.07)	(0.01)		
GCC	0.10	0.1	_ _ _	----
	(0.03)	(0.04)		
OneUC	-0.37	-1.02	-5.27	0.57
	(0.09)	(0.01)	(0.46)	(0.42)
R-Square	0.5910	0.5905	0.6190	----
Observations	3867	3871	3867	----
	F(17,3801)=77.17	F(17,3807)=39.66	F(17,3629)=118.14	F(17,3635)=52.42
	Prob > F = 0.0000	Prob > F = 0.0000	Prob > F = 0.0000	Prob > F = 0.0000

Note: column 1and 2 represents regression results of time, exporter and importer effect for sector (5) by using McCallum's equation, and Anderson and van Wincoop's equation respectively. Column 3 and 4 shows regression results of country pair and time effects for sector (5) by using McCallum's equation and Anderson and van Wincoop's equation respectively.

Table 8: Regression Results: Sector 6

Variable/Model	1	2	3	4
GDPExporter	0.60	---	0.70	---
	(0.00)		(0.09)	
GDPImporter	0.80	----	0.60	----
	(0.06)		(0.05)	
popexporter	1.60	0.20	1.60	0.20
	(0.02)	(0.03)	(0.03)	(0.00)
popImporter	0.30	0.10	0.03	0.01
	(0.05)	(0.04)	(0.02)	(0.01)
Distance	-1.10	-0.20	----	----
	(0.04)	(0.02)		
CUS	1.10	0.30	0.20	0.3
	(0.04)	(0.03)	(0.04)	(0.05)
Border	-1.73	0.91	_ _ _	----
	(0.00)	(0.04)		
Language	6.50	6.50	_ _ _	----
	(0.01)	(0.00)		
GCC	0.20	1.00	_ _ _	----
	(0.03)	(0.03)		
OneUC	-1.12	-2.87	-9.04	1.78
	(0.00)	(0.00)	(0.01)	(0.01)
R-Square	0.5842	0.5468	0.6450	0.5893
Observations	3867	3871	3867	3871
	F(17,3801)=73.91	F(17,3807)=54.45	F(17,3629)=123.16	F(17,3635)= 82.97
	Prob > F = 0.0000	Prob > F = 0.0000	Prob > F = 0.0000	Prob > F = 0.0000

Note: column 1and 2 represents regression results of time, exporter and importer effect for sector (6) by using McCallum's equation, and Anderson and van Wincoop's equation respectively. Column 3 and 4 shows regression results of country pair and time effects for sector (6) by using McCallum's equation and Anderson and van Wincoop's equation respectively.

Table 10: Regression Results: Sector 7

Variable/Model	1	2	3	4
GDPExporter	0.20	---	0.20	---
	(0.02)		(0.06)	
GDPImporter	0.20	----	0.20	----
	(0.04)		(0.01)	
popexporter	1.60	0.30	1.60	0.20
	(0.05)	(0.04)	(0.04)	(0.09)
popImporter	0.10	0.10	0.20	0.20
	(0.05)	(0.05)	(0.03)	(0.02)
Distance	-1.70	0.30	_ _	_ _
	(0.01)	(0.03)		
CUS	-0.10	-0.40	-0.20	-0.30
	(0.03)	(0.02)	(0.03)	(0.01)
Border	-1.34	0.92	_ _ _	----
	(0.06)	(0.10)		
Language	3.70	5.30	_ _ _	----
	(0.05)	(0.01)		
GCC	2.80	1.80	_ _ _	----
	(0.03)	(0.00)		
OneUC	-0.27	-2.39	-5.32	0.26
	(0.00)	(0.00)	(0.01)	(0.03)
R-Square	0.5037	0.5258	0.5490	0.5325
Observations	3867	3871	3867	3871
	F(17,3801)=52.47	F(17,3807)=47.61	F(17,3629) = 81.86	F(17,3635)= 64.45
	Prob > F = 0.0000	Prob > F = 0.0000	Prob > F = 0.0000	Prob > F = 0.0000

Note: column 1and 2 represents regression results of time, exporter and importer effect for sector (7) by using McCallum's equation, and Anderson and van Wincoop's equation respectively. Column 3 and 4 shows regression results of country pair and time effects for sector (7) by using McCallum's equation and Anderson and van Wincoop's equation respectively.

Table 11: Regression Results: Sector 8

Variable/Model	1	2	3	4
GDPExporter	0.50	---	0.50	---
	(0.03)		(0.01)	
GDPImporter	0.40	----	0.40	----
	(0.01)		(0.06)	
popexporter	1.30	0.20	1.30	0.30
	(0.03)	(0.03)	(0.00)	(0.00)
popImporter	0.30	0.10	0.80	0.20
	(0.04)	(0.02)	(0.03)	(0.01)
Distance	-1.10	-0.70	_ _	_ _
	(0.03)	(0.03)		
CUS	0.50	0.50	0.6	0.50
	(0.02)	(0.02)	(0.06)	(0.78)
Border	-1.20	1.30	_ _ _	----
	(0.08)	(0.10)		
Language	1.70	5.4	_ _ _	----
	(0.07)	(0.00)		
GCC	2.00	1.6	_ _ _	----
	(0.03)	(0.04)		
OneUC	0.06	-3.10	----	-0.92
	(0.08)	(0.01)		(0.42)
R-Square	0.5484	0.5645	0.6433	0.5930
Observations	3867	3871	3867	3871
	F(17,3801)=63.85	F(17,3807)=58.83	F(17,3629)=111.35	F(17,3635)=87.40
	Prob > F = 0.0000	Prob > F = 0.0000	Prob > F = 0.0000	Prob > F = 0.0000

Note: column 1and 2 represents regression results of time, exporter and importer effect for sector (8) by using McCallum's equation, and Anderson and van Wincoop's equation respectively. Column 3 and 4 shows regression results of country pair and time effects for sector (8) by using McCallum's equation and Anderson and van Wincoop's equation respectively.

Table 12: Regression Results: Sector 9

Variable/Model	1	2	3	4
GDPExporter	0.50	----	0.60	----
	(0.02)		(0.06)	
GDPImporter	0.20	----	0.70	----
	(0.04)		(0.01)	
popexporter	0.30	0.20	0.30	0.20
	(0.03)	(0.06)	(0.04)	(0.03)
popImporter	0.40	0.50	0.4	0.70
	(0.05)	(0.03)	(0.3)	(0.02)
Distance	2.40	2.20	_ _	_ _
	(0.00)	(0.01)		
CUS	0.20	0.30	0.19	0.30
	(0.07)	(0.01)	(0.77)	(0.04)
Border	-0.39	1.82	_ _ _	----
	(0.06)	(0.10)		
Language	1.60	5.80	_ _ _	----
	(0.07)	(0.09)		
GCC	6.40	1.60	_ _ _	----
	(0.02)	(0.03)		
OneUC	-2.40	0.65	-5.35	4.36
	(0.00)	(0.00)	(0.46)	(0.02)
R-Square	0.5619	0.5063		0.5835
Observations	3867	3871	3867	3871
	F(17,3801)=24.43	F(17,3807)=23.05	F(17,3629) = 44.50	F(17,3635)=34.16
	Prob > F = 0.0000	Prob > F = 0.0000	Prob > F = 0.0000	Prob > F = 0.0000

Note: column 1and 2 represents regression results of time, exporter and importer effect for sector (9) by using McCallum's equation, and Anderson and van Wincoop's equation respectively. Column 3 and 4 shows regression results of country pair and time effects for sector (9) by using McCallum's equation and Anderson and van Wincoop's equation respectively.

GCC Countries and Major Trading Partners

Australia	**Hong Kong**	**Qatar**	**United States**
Austria	**India**	**Saudi Arabia**	**Yamen**
Bahrain	**Indonesia**	**Singapore**	
Brazil	**Ireland**	**South Korea**	
Canada	**Italy**	**Spain**	
China	**Japan**	**Sudan**	
Cyprus	**Jordan**	**Sweden**	
Denmark	**Kuwait**	**Switzerland**	
Egypt	**Malaysia**	**Syria**	
France	**Netherlands**	**Thailand**	
Germany	**Oman**	**United Arab Emirates**	
Greece	**Pakistan**	**United Kingdom**	