Size of Economy, Cost of Transport and their impact on Trade in GCC countries: Evidence from qualitative and quantitative approaches

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Abstract

This paper addresses the intra-regional trade of the countries of the Gulf Cooperation Council (GCC), namely, the United Arab Emirates, Bahrain, Saudi Arabia, Oman, Qatar and Kuwait. We have found that the intra-regional trade is still at a modest level, where the trade intensity index showed negative signals except the UAE, and Saudi Arabia.

In addition, the study used a basic gravity model, and added six foreign countries – Malaysia, Turkey, Iran, the UK, Australia and Brazil. It confirms that the size of GDP has a significant role in determining the foreign trade. Moreover, the variable of transportation cost rate is not a concern for Saudi's foreign trade despite the increase in its level, where Saudi Arabia as a hub economy tends to trade with countries like Turkey, the UK, and Brazil more than with its nearby countries, especially Oman, and Qatar. The study concludes that the unified economic policy of the GCC countries has not achieved its target in terms of increasing the level of non-oil industries. Furthermore, the transportation cost rate variable is not an important factor to determine the trade of GCC countries.

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1 Introduction

The foreign trade commodity is one of the most important factors for economic growth in GCC countries, especially for Saudi Arabia as a main producer and exporter of crude oil, as all GCC countries have a heavy reliance on the world by importing most of their capital and consumer goods.

Using the gravity models has become a common method to explain several kinds of flows, such as migration, maritime and land transport, and bilateral trade flows. In particular, logarithmic linear equations can be interpreted for foreign trade flows from point (A) to point (B) by economic factors related to these points and other factors that stimulate or hinder the trade flows between the two points (Bergstrand, 1985, p.447).

In respect of bilateral trade flows among countries, a gravity model explains the trade flows between two countries by the positive proportion of their GDP, and inversely with the distance between them; the gravity model derived its name from a similar relationship in physics that explains gravity (Rose, 2000, p.8). The distance between countries is the main factor that affects foreign trade flows, and is included in most studies that use the gravity model to explain the cost transport rate of trade flows.

The success of the gravity model is due to its ability to explain the practical issues such as trade between developed countries and intra-trade between sectors, which cannot be interpreted by the classical theories of international trade (Deardorff, 1984, p.481). In this paper, the researcher attempts to analyse the gravity model practically, and in order to obtain accurate results, we have added certain distant foreign countries, namely, Turkey, Iran, the United Kingdom, Australia, Brazil and Malaysia in order to analyse the role of GDP and distance as two essential independent variables in the model that we will adopt it. Therefore, we will consider the foreign trade of the hub economy of the GCC countries as a dependent variable over the period 1998-2008, in order to identify its potential with the other countries being studied.

2 Literature review

The role of trade, regionally and internationally, as an engine of economic growth has increased considerably, particularly in countries that follow a policy of encouraging exports, where it leads to an increase in the gross domestic product level and improved terms of trade, which, in turn, reflects achieving acceptable economic growth. Therefore many scholars have emphasized the positive role of improving the level of foreign trade and then economic openness. In this context, many studies have emerged addressing the role of foreign trade, the most important studies are those of Fischer, which analysed the relationship between the policy of import substitution and its positive impact on growth after World War II, and encouraged export growth (Fischer, 2003, p12). He confirms the role

of economic policy in promoting export levels and enhancing the rate of growth. He reports that a greater degree of economic openness will promote growth and income level as well, as the open countries have increased their economic growth rate by 2% compared with closed countries. This positive effect occurs through the increased level of trade. Moreover, Fisher stresses that countries that wish to grow, must be integrated into the global economy to take advantage of the foreign market, and foreign investment flows.

Rodrik, (1999), sees that promotion of exports is a part of trade policy, and can be considered as a tool of funding imports. His study shows the experience of 25 developing countries that have witnessed the fastest economic growth rates over the period 1965-1994 and which were characterized as high level (10%).The main notion of this study is that it confirms the significant role of exports to stimulate economic activities and enhance the level of growth.

Alcala and Ciccone, (2003) found that trade and local markets were the major determinants of economic growth over the period 1960-1996. Their study tests trade openness, which they consider as an appropriate measure of trade. In this study, the average growth rate of income per capita is the dependent variable of the study's model, while trade openness, local market size, institutional quality, initial income per capita are the independent variables.

Spanue, (2003) affirmed that the liberalization of foreign trade leads to a positive impact on the economy and may lead to economic growth, where the critical issue in this growth is the economic and trade policies followed by the state to determine the trend of economic growth. The main point in this study concerns foreign trade and the importance of the lifting of trade restrictions as a significant process to obtain WTO membership. These steps are consistent with the conditions of the International Monetary Fund (IMF) and World Bank (WB) for achieving economic reformation and enhancing the level of foreign trade.

Falvey, et.al., (2001) focused on the positive effect of foreign trade on economic growth of developing countries through its role in transferring the technology to countries that imported capital goods. In addition, this study confirmed the expansion of trade relations between developing and developed countries. Furthermore, it reported that the open trade policy is a good motivation that promotes economic growth resulting from foreign trade, which could lead to sustainable economic growth. The study was based on Endogenous growth theories, which suggest that countries benefit from foreign trade through the import of capital goods, and advanced technology.

Vido and Barry, (2003) utilised two models to measure foreign trade flows between countries: the marine and land transport gravity model. In the marine model, the study only tests the quantity of lentils exported by container transport from Canada to 97 different countries, while in the land transport model, the study tested refrigerated transport trucks between Canada and USA, where the test commodity is fresh and frozen pork. The regression result of the marine transport gravity model is statistically significant at the 5% level, where the model confirms that a 1% decline in freight rate would result in an increased level of export by

more than 1.2%, which means that lentil exports are sensitive to the cost of transport.

In addition, the result of the land transport gravity model indicates that the transport cost elasticity is significantly larger than for the marine transport model. Since sea transport is much cheaper than other means of transport. This study characterized the use of actual transportation cost data instead of distance, which is considered more useful.

Pack, (1993) made clear that companies operating in the area of export are always more efficient in production compared with companies that produce for the local market. His study affirms that these results do not indicate a causal relationship between exports and efficiency resulting from the success of these companies in the technology transfer by foreign trade, and that it may be that the link between exports and efficiency results from the fact that only more efficient companies are able to export their products to global markets, where the competition between these companies is a significant factor that stimulates the expanding level of exports.

Brun, et al., (2003) in their study, found that there is a decline in the estimate of elasticity of trade to distance of about 11% over the period 1962-1996 for the whole sample of study, which includes 130 countries, especially between rich countries, which show a clear decline in this respect.

In this study, the researchers call the distance variable a "puzzle". However, the study strongly confirms that the distance coefficient falls with respect to time, especially with container patterns of transport.

The study used several variables of the panel gravity model to address the distance "puzzle", as called by this study, which shows that distance is a significant factor for several specific models. However, it is significantly reduced when the gravity model is specified to include the remoteness of countries, where the study confirms a decrease in the importance of the role of distance as a barrier to trade over time.

Carrillo and Li, (2002) analysed the importance of trade agreements in enhancing intra-industrial trade of Latin American countries over the period 1980-1997. The study reports that increasing the level of intra-trade in these countries is attributed to the role of intra-industrial trade, which witnessed a significant increase during the said period.

The study tested the effectiveness of trade agreements in raising the trade level by applying a gravity model of bilateral trade flows. It found that these trade agreements have had an impact on the dynamism of intra-regional trade and on the high increase of intra-industrial. In addition, it confirms that distance has a statistically significant effect, and that size of economy is considered a main determinant of trade.

Sohn, (2001) analysed Korea's trade pattern based on the gravity model. His study suggests possible ways to expand foreign trade by identifying the important factors that determine Korea's bilateral trade flows. This study added new independent variables, such as the trade conformity index and APEC

membership, in order to examine the trade patterns of Korea in terms of following the Heckscher-Ohlin model or the differentiated product model.

Furthermore, Sohn found that Korea's bilateral trade patterns strongly fit the gravity model and that inter industry trade is explained by the Heckscher-Ohlin model. However, he reports that the expansion of bilateral trade volumes of Korea could be promoted with closer countries that have large economies. The study assumes that Korea's actual trade volume with countries like Japan and China present greater advantages in terms of size of the economy and distance. However, the result of the gravity model for this study shows a shortage of trade volumes between Korea and these countries; the study explains that this phenomenon is caused by the existence of significant trade barriers between these countries.

Makki and Somwaru, (2004) found that the role of foreign trade is an important instrument for economic growth. This study is based on an analysis of the role of foreign trade and foreign direct investment in 66 developing countries over three decades. They found that foreign trade and foreign direct investments make a significant contribution towards raising the level of economic growth in the countries under study, and that this growth is conditional on the stability of macroeconomic policies and institutional rules, which are considered key factors for achieving economic growth. Moreover, this study found that reducing the rate of inflation, tax rate, and government consumption would enhance economic growth in developing countries. Therefore, this study stresses that the foreign trade is an important source of economic growth and that there is a direct correlation between FDI and foreign trade in raising the level of economic growth. This study also addressed the role of trade policies, which improve the level of production based on the principle of competitive advantage.

3 Methodology

This study is based on two approaches. The first is the analytical academic approach, which will depend on an analysis of the data of study to extrapolate the reality of GCC economies for the period 1998-2008. Also, in this approach, the researcher will depend on a number of tables and graphs that are associated with the analysis of the study.

Regarding the commercial relationship between GCC countries, the researcher will adopt a mathematical formulation[3] to measure and assess the

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[3] This formulation was used by United Nations – ESCWA to calculate the level of intra-trade in western Asian countries in the year 2005. For more information look at:
- United nations, Economic And Social Commission For Western Asia, ESCWA (2005), survey of economic and social progress, New York, p. 81.

intensity of Intra-trade of GCC countries, in order to identify the reality of regional trade between these countries, this formulation is:

$$C_i = \frac{X_{GCC} - M_{GCC}}{X_{total} + M_{total}} - \frac{X_{GCC} + M_{GCC}}{X_{total} + M_{total}} \cdot \frac{X_{total} - M_{total}}{X_{total} + M_{total}}$$

Where:

C_i :   Intensity of regional trade of the country (i) with other GCC countries in the net total export as average of the period 1998-2008.

X_{GCC}: Intra-export from country *i* to other GCC countries.

M_{GCC} : Intra-import from country *i* to other GCC countries.

X_{total} : Total export of the country *i* to the world countries.

M_{total} : Total import of the country *i* from the world countries.

By the formulation above, if (Ci) is positive that means the country (i) has dense exports with GCC and other countries, and vice versa. When (C_i) is negative that means the country (i) has dense imports with GCC and other countries. The country that has the highest density of trade over the period 1998-2008 will be considered as the leading market in GCC countries.

The second matter in this study is forming a Gravity model to estimate the trade of the leading market with the other GCC countries, as well as examining the model of the GCC's leading market with other geographically distant countries. The main reason for that is to compare the reality and to find out the validity of the gravity model between a leading market and the rest of GCC, as well as examine it with other non-GCC countries.

3.1 Assumption of the model

The used formula is based on the following assumptions:
1. There is a positive relationship between the level of GDP and the level of trade in GCC countries.
2. There is negative relationship between the level of trade and the distance between the countries under study.

3.2 Formulation of the model

Based on the assumptions above, the major formula of the foreign trade model between the leading market of the GCC and other countries can be expressed as a function of GDP, and the transportation cost rate as a proxy of distance between countries as follows:

$$TRD_{ij} = f(GDP_j, Cost_{ij})$$

where

TRD_{ij}: value of total commodity trade from country i to country j over a period t.

GDP_j: value of gross domestic production of a country j over a period t.

$Cost_{ij}$: Transportation cost rate between the capital city of country i and country j.
(A proxy for distance between countries).

3.3 Description of the model

After adding the error term (U_i), the specific gravity model will be as in the following formulation:

$$Log(TRD_{ij}) = a_0 + B_1 \log(GDP_j) + B_2 \log(Cost_{ij}) + U_i$$

where

i and j : denotes the countries

a_0: constant .

B_1, B_2 are coefficients to be estimated.

U_i: error term.

4 Reality of Intra- regional trade in GCC countries

The average of intra-trade in GCC countries ranges between 6% - 14.6% for the total foreign trade over the period 1998-2008. These modest proportions are attributed to the similarity of production patterns in these countries, which makes its trade a limited activity in general.

During the period 1998-2008, the average of intra-trade is about USD 29,473.6 million. This represents 8.6% of the average total of non-oil foreign commodity, which amounted to USD 344,239.21 million, where the value of imports is about USD 154,175.58 million, and the value of exports is USD 190,063.63 million[4]. In Table 1 the researcher notes that both Saudi Arabia and the United Arab Emirates have the biggest share of the average of total intra-exports, which amounted to USD 9454.97 million, and USD 5556.78 million, respectively. The proportion of intra-exports is estimated to be 52% and 30%, respectively, during the period 1998-2008.

The most important exported commodities are industrial products, and natural resources. Industrial exports of Saudi Arabia are estimated to be 63%, followed by natural resources (29%) and the remaining percentage, 8% represents agricultural and animal products (GCC, 2007, p6).

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[4] Look at the Table 3.

According to the above, we see that increasing the level of intra-exports is related to the level of investment of non-oil sectors. However, we see that foreign direct investment is a good way within this framework in order to achieve rapid economic growth. Also, the low level of intra-exports in GCC countries refers to the weakness of diversification.

Table 1: Direction of Intra-Export commodity in GCC States [*]
Average of period 1998-2008   (Million USD)

To: Exporting country	UAE	Bahrain	KSA	Oman	Qatar	Kuwait	Total	Share in total GCC (%)
UAE		411.10	580.47	3402.3	673.05	489.86	5556.78	30
Bahrain	172.88		477.65	58.07	90.71	73.59	872.9	5
KSA	2888.03	2625.7		2502.9	585.66	852.5	9454.79	52
Oman	513.71	17.36	129.78		56.60	33.14	750.59	4
Qatar	752.0	44.64	200.2	23.61		31.29	1051.74	6
Kuwait	189.42	32.54	185.08	25.08	56.92		489.04	3
Total GCC	----	----	----	----	----	----	**18175.84**	100%

Source: See [11, 12, 13, 14], [15, 16, 17, 18], [27].
      (*) Excluding crude oil.

This could be enhanced through using the high level of oil revenue to increase the non-oil industries and decrease the leakage of a large part of the income of these countries. Therefore, the important issue is investing the oil revenue in non-oil projects. This will significantly contribute to increasing the level of value added and diversifying the production structure in order to meet the local needs, with the possibility of exporting the surplus commodities to other GCC countries, which helps to increase the level of total intra-exports. Moreover, we note in Table 2 that UAE has reached the first rank in terms of its total intra-imports, which amounted to USD 3146.35 Million and represents 28% of the total intra-GCC imports, in which chemical products is the most important commodity imported by the UAE from Saudi Arabia, which represents 20% of the total intra-imports of GCC countries on average for the period 1998-2008. Also, both Oman and Qatar represent 15%, 14%, respectively, followed by Kuwait and Bahrain in proportions 13.5% and9.5%, respectively (Ibid, p. 3).

Table 2: Direction of Intra-Import in GCC countries[(*)],
Average of period 1998-2008 (Million USD)

From: Importing Country	UAE	Bahrain	KSA	Oman	Qatar	Kuwait	Total	Share in Total GCC (%)
UAE		325.38	2156.35	158.75	242.46	263.41	3146.35	28
Bahrain	210.33		777.28	24.15	27.16	34.96	1073.88	9.5
KSA	1264.6	473.34		189.0	146.0	169.3	2242.24	20
Oman	1366.8	75.91	254.09		15.36	27.53	1739.69	15
Qatar	711.36	116.61	599.93	91.56		53.96	1573.42	14
Kuwait	488.08	75.75	892.19	48.82	17.34		1522.18	13.5
Total GCC	---	---	---	---	---	---	**11297.76**	100%

Source: See [11, 12, 13, 14], [15, 16, 17, 18], [27].
     (*) Excluding crude oil.

Table 2 also, shows that both Oman and Qatar have a major relative contribution in terms of intra-import, and we see that the United Arab Emirates is the first commercial partner of Oman. Omni's imports reached USD 1,366.8 million on average over the period 1998-2008, which represents 78%[5] of the total imports for the rest of the GCC countries. This confirms the significant trade relation between the UAE and Oman.
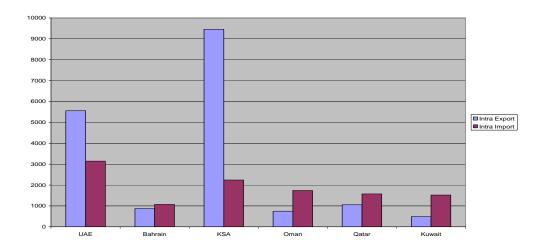
Similarly, Qatar imports most of its needs from the United Arab Emirates and Saudi Arabia, where the rates of intra-import range between 45% and 38% respectively, while the rest of the ratios are distributed among the rest of the other GCC countries. Moreover, Kuwait is the first trade partner of Saudi Arabia. The rate of intra-imports is estimated to be 59% of the total Kuwaiti intra-imports from other GCC countries during the period 1998-2008. The UAE is the second trade partner of Kuwait, where its import ratio from UAE amounted to 32% of the average of total imports from the rest of the GCC countries.

In addition, the industrial products represent the largest share in total intra-imports, where it is about 67% of the total intra-imports over the period 1998-2008, followed by natural resources at 19% and agricultural products and animal products at 11% (GCC, op cit, p13).

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[5] Calculated based on Table 2: 1366.8 / 1739.69 = 78%

Finally we find that the UAE and Saudi Arabia are the main trading partners compared with the rest of the GCC countries in terms of the two sides, import and export. The following figure represents this fact.

Source: based on data of Table 1 and Table 2.

Figure 1: Average of Intra-Export and Import in GCC States - 1998-2008

Figure 1 clearly confirms that both Saudi Arabia and the United Arab Emirates represent the main market of intra-trade of the GCC countries for the period 1998-2008, whereas Oman is the first trade partner of each.

It was also noted previously that intra-trade remained at a low level during the period 1998-2008. This fact is clearer when we compare GCC's intra-trade with their foreign trade commodity during the said period, where the average intra-trade represents 8.6% of the total foreign trade during the period 1998-2008, which shows a weakness of intra-trade commodities in these countries. As shown in Table 3, it represents the share of GCC countries in its contribution to the total intra-trade as a percentage of total foreign trade, the high ratio in Oman, 14.6%, is because the Omani economy has a high trade level with the rest of the GCC countries, particularly Saudi Arabia and the United Arab Emirates, which means there are strong commercial relationships between Oman and these countries.

By the same reason, Bahrain ranks in the second level, which amounted to13%, while Saudi Arabia and Qatar are dominating on 11.6% and 11%, respectively. We note that both the United Arab Emirates and Kuwait represent the lowest level in total contribution of intra-trade (6%) and (4%), respectively, as a percentage of average of total foreign trade.

Table 3: Average of foreign trade commodity and Intra-trade commodity in GCC
countries [*] 1998-2008 (Million USD)

Column No.	(1)	(2)	(3)	(4)	(5)	(6)	(7)
			(1+2)			(4+5)	(6) /(3)
Country	Export	Import	Foreign Trade	Intra-Export	Intra-Import	Intra-Trade	Share of Intra-trade of Foreign trade (%)
UAE	75812.11	66443.17	**142255.28**	5556.78	3146.35	**8703.13**	6
Bahrain	9441.13	5288.56	**14729.69**	872.9	1073.88	**1946.78**	13
KSA	49180.86	51459.78	**100640.64**	9454.79	2242.24	**11697.03**	11.6
Oman	8244	8798.72	**17042.72**	750.59	1739.69	**2490.28**	14.6
Qatar	14639.96	8984.35	**23624.31**	1051.74	1573.42	**2625.16**	11
Kuwait	32745.57	13201.0	**45946.57**	489.04	1522.18	**2011.22**	4
Total GCC	**190063.63**	**154175.58**	344239.21	18175.84	11297.76	29473.6	**8.6**

Source: See [4] and SESRIC, (2009), Annual economic report on the OIC countries,
Ankara, p.71-72.

The columns No (4), (5) based on previous tables.

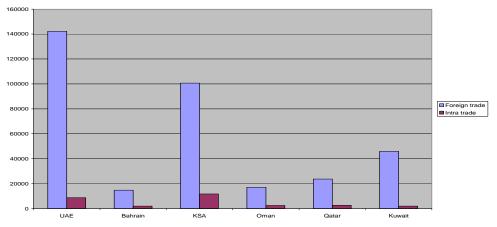The columns No. (3), (6) and (7) calculated by the researcher.

(*) Excluding crude oil.

However, this issue implies that the UAE economy has a high dependence
on foreign trade, which represents 41% of the total average of foreign trade in the
GCC countries for the period 1998-2008. Furthermore, we see that the average of
intra-trade of the UAE amounted to 29.5%[6] over the period of study. Therefore,
the UAE is considered a vital economy in terms of its relation with the GCC and
non-GCC countries. In other words, the UAE economy is a more open economy
towards the world market in comparison with the other GCC countries.

Moreover, Table 3 illustrates that Saudi Arabia is ranked in the third level
in terms of intra-trade as a proportion of foreign trade, which represented 11.6%.
While its foreign trade represents 29% of the total foreign trade volume of the
GCC countries, and its intra-trade amounted to 39.6% of the total trade volume
between the GCC countries. Oman and Bahrain represent the lowest rate (5% and
4%), respectively, of the total volume of foreign trade, for which they depend on
other GCC countries to meet their commodity needs.

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[6] Calculated based on data of Table 3.

In respect of Qatar and Kuwait, the foreign trade commodity represents 7% and13%, respectively. While the intra-trade amounted to 9%, 7% of the total trade volume between GCC countries. Therefore, we can say that Qatar has more reliance on intra-trade compared to Kuwait. In other words, Kuwait depends on other countries outside of the GCC to meet its commodity needs. Also, the UAE and Saudi Arabia are the major economies in the GCC in general, which are controlling the largest share in respect of foreign and intra-trade, as mentioned before. The following figure shows the average volume of commodity trade, during the period 1998-2008.

Source: Formed by the researcher based on data of Table 3.

Figure 2: Average of foreign and Intra-trade commodity in GCC countries – 1998-2008 (Million USD)

Figure 2 confirms that the United Arab Emirates and Saudi Arabia represent the largest economic power in the Gulf Cooperation Council, in both, foreign trade and intra-trade. The main issue that must be emphasized is that intra-trade in this study only includes domestic produced goods–as was mentioned already –and does not include transit. The researcher has excluded the transit trade and crude oil to show the real situation of intra-trade.

In addition, Figure 2 verifies that Bahrain and Oman have the lowest foreign trade level, and that Kuwait has heavy reliance on foreign trade compared with its small intra-trade. Also, the situation is similar in Qatar, its intra-trade level is better than Kuwait.

According to previous analysis, and to determine the intensity of intra-trade in the GCC countries during the period 1998-2008, the researcher will use the following formulation:

$$C_i = \frac{X_{GCC} - M_{GCC}}{X_{total} + M_{total}} - \frac{X_{GCC} + M_{GCC}}{X_{total} + M_{total}} \cdot \frac{X_{total} - M_{total}}{X_{total} + M_{total}}$$

where

C_i: Intensity of intra-trade of the country i with other GCC countries in the net total export.

X_{GCC}: Intra-export from country i to other *GCC* countries.

M_{GCC}: Intra-import from country i to other *GCC* countries.

X_{total}: Total export of the country i to the world countries.

M_{total}: Total import of the country i from the world countries.

UAE:

$$C_i = \frac{2410.43}{142255.28} - \frac{8703.13}{142255.28} \frac{9368.94}{142255.28} = 0.0169 - 0.0611*0.0658 = 0.0129$$

The above result indicates that the UAE has a density in its intra-export commodity, which implies that the UAE economy has achieved a surplus in the commodity production during the period 1998-2008. Furthermore, it increased the growth level of intra-trade over the same period; in other words, the UAE economy achieved a competitive advantage in its intra-export more than its intra-imports.

Bahrain: By using the same previous formulation, we obtain the following result:

$$C_i = \frac{-200.98}{14729.69} - \frac{1946.78}{14729.69} \frac{4152.57}{14729.69} = -0.0136 - 0.1321* 0.2819 = -0.0508$$

The negative result above shows that Bahrain has a density in its intra-import, which confirms its increased reliance on the other GCC countries for obtaining its commodity needs.

KSA:

$$C_i = \frac{7212.55}{100640.64} - \frac{11697.03}{100640.64} \frac{-2278.92}{100640.64} = 0.0716 - 0.1162*(-0.0226) = 0.0742$$

The positive result above confirms that Saudi Arabia has a large concentration in intra-export and is superior to the United Arab Emirates, which can largely be attributed to its substantial GDP, which helped it to increase the level of intra-export during the period 1998-2008.

Oman:

$$C_i = \frac{-989.1}{17042.72} - \frac{2490.28}{17042.72}\frac{-554.72}{17042.72} = -0.0580 - 0.1461*(-0.0325) = -0.0533$$

The negative result above indicates that Oman has a density in the intra-import with other GCC countries. Also we note its trade is more than Bahrain's intra-import.

Qatar:

$$C_i = \frac{-521.68}{23624.31} - \frac{2625.16}{23624.31}\frac{5655.61}{23624.31} = -0.0220 - 0.1111*0.2393 = -0.0485$$
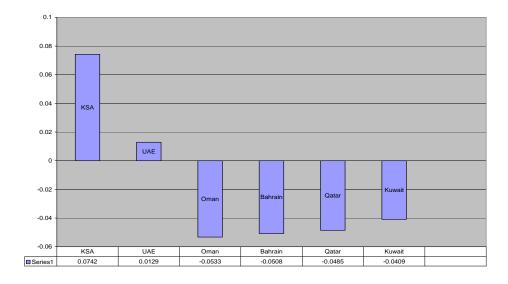
As we noted in cases of Oman and Bahrain, the negative result above indicates that Qatar has a density in its intra-import.

Kuwait:

$$C_i = \frac{-1033.14}{45946.57} - \frac{2011.22}{45946.57}\frac{19544.57}{45946.57} = -0.0224 - 0.0437*0.4253 = -0.0409$$

The above result shows that Kuwait has a low density in intra-import in comparison to Qatar, Bahrain and Oman, which means that Kuwait is not active in the field of intra-trade and confirms that the Kuwaiti economy has a weak commercial relationship with other GCC countries.
To facilitate the analysis, we can set the obtained results in Figure 3.

	KSA	UAE	Oman	Bahrain	Qatar	Kuwait	
Series1	0.0742	0.0129	-0.0533	-0.0508	-0.0485	-0.0409	

Source: Formed by researcher based on the result of trade intensity

Figure 3: Intensity of Intra-trade in GCC - Average of period 1998-2008

Figure 3 and its indicators shows the level of intra-trade intensity of the GCC countries during the period 1998-2008. It shows that Saudi Arabia is a major economy in terms of intra-trade intensity. The rest of the GCC countries, except the UAE, have obtained negative signals, which confirmed their intra-import density. In this regard Oman comes in the first level, then Bahrain, Qatar and Kuwait, which indicates that this negative group is reliant on Saudi Arabia as a main partner, as well as world markets to meet its various commodity needs.

According to the above, we can say that Saudi Arabia has made a positive impact on the intra-trade, which means that the commodity products of this country have a competitive position compared to the rest of the GCC countries that import these products. However, according to the positive signals of intensity index, we see that Saudi Arabia and UAE have a positive role in their non-oil sectors during the period 1998-2008.

In respect of the negative group (Bahrain, Qatar, Kuwait and Oman) we can say that these countries have not achieved a competitive advantage in their non-oil sectors. Therefore, these countries are still suffering from weakness of the level of non-oil industries and mainly depend on the oil sector, except Bahrain. In other words, the efforts of economic diversification in these countries are not reaching their objectives in this respect.

Finally, the researcher sees that the continued weakness of intra-trade in the GCC countries and the high level of oil share in GDP over the period 1998-2008 are the main reasons that led to the increase in the level of integration with the global economy, more than between GCC countries. Meaning, that the efforts of the GCC countries to diversify the production structure have not achieved their aims except for Saudi Arabia and UAE, the economies of which still depend on the oil sector, which helped to increase the level of economic openness. However, it did not increase the level of intra-trade even though it was an important target of the unified economic policy of the GCC bloc.

5 The Model
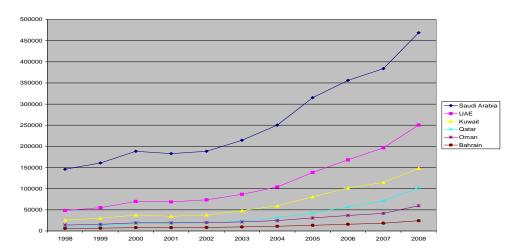
5.1 Variables of the gravity model

5.1.1 GDP

As is well known, GDP is a key measure of economic performance in all countries, as it reflects the state of the economy. Therefore, it is often used to compare the aggregate performance of the economy, and, thus, is a more comprehensive indicator for comparing the outputs of all goods in the countries of this study. The researcher will try to compare the GDP of Saudi Arabia with the GDP of the other GCC countries. It is also compared with other selected foreign countries (Malaysia, Iran, Turkey, Brazil, Australia, and the United Kingdom) where the GCC countries reflect the intra-regional trade, in an additional attempt

to analyse the reality of trade between GCC countries. This is to further analyse continuously the previous results that used the density trade index.

The main target for adding selected foreign countries is to achieve more accurate findings by using the gravity model. Where the result that we obtained in the last approach, showed that GCC countries had more trade with foreign countries than their intra-regional trade, because of the similarity of production pattern, in which all the GCC countries (Except Bahrain) are major producers of Oil. Therefore, the researcher has added the foreign countries that are considered the main foreign trade partners of Saudi Arabia, for analysing the gravity model.

Saudi Arabia has been selected as the main economy in the GCC countries according to its GDP over the period 1998-2008, as well as the Saudi trade intensity index, which was at the highest level during the period that we mentioned above. In the case of GCC countries the researcher sees that the size of GDP, as an independent variable in the gravity model, will be a major determinant. It will be more important than the variable of transport cost rate, because the level of foreign trade of GCC countries is higher than its level in terms of the intra-regional trade in GCC countries.

In a gravity model we will analyse the importance of Saudi's foreign trade with the rest of the GCC countries as well as with selected non-GCC countries. Therefore, it is necessary to present an analysis of model variables for a clear picture of the specific gravity model of Saudi Arabia with selected countries. The following figure shows the size of GDP of Saudi Arabia compared with the rest of GCC countries.

Source: League of Arab states, et.al (2004), (in Arabic) Joint Arab economic report, Abu Dhabi, annex 2 / 2.
League of Arab states, et.al (2009), (in Arabic), Joint Arab economic report, Abu Dhabi, p. 266.

Figure 4 : GDP of Saudi Arabia and the rest of GCC countries
Average 1998-2008,(Million USD)

Figure 4 confirms that Saudi Arabia has a significant GDP compared with other GCC countries during the period 1998-2008.Consequently, we selected it as the major economy for analysing the gravity model. In addition, the figure above reflects the inefficiency of this variable as a key factor that determines the size of intra-regional trade in GCC countries. As noted before, the trade intensity index was positive in Saudi Arabia and negative in the rest of the GCC countries (Except for the UAE), where most of the GCC countries import more from Saudi Arabia than they export. In other words, the Saudi economy is considered as a hub economy in the GCC countries.
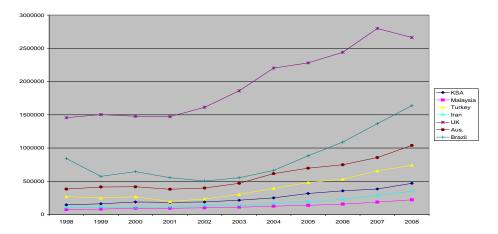
Now, let us note the size of Saudi's GDP compared with the selected non-GCC countries, as shown in the following Table 4.

Table 4: Size of Saudi's GDP compared with non-GCC countries (Million USD)

Years	Saudi Arabia	Malaysia	Turkey	Iran	UK	Aus.	Brazil
1998	145967	74948	269262	104410	1456160	382283	841296
1999	160957	82189	249761	108876	1502890	413573	573119
2000	188442	93789	266559	102930	1477581	416923	644702
2001	183012	92783	196007	110410	1470891	380428	553582
2002	188551	100845	232530	135525	1612056	397239	504221
2003	214573	110202	303008	136645	1860810	468469	552469
2004	250339	124749	392156	162746	2202490	615276	663760
2005	315337	137954	482985	194175	2280114	696034	882185
2006	356155	156409	530917	226530	2439424	749316	1088917
2007	383871	186720	657277	290020	2799040	856816	1365983
2008	468800	221437	741448	346611	2662652	1039415	1637924

Source: Data base of World Bank: http://www.worldbank.org.

For easy understanding, we can display Table 4 by Figure 5. Figure 5 shows that the non-GCC countries in this model are distinguished by a high level of GDP compared with Saudi Arabia –except Malaysia. Furthermore, these countries are characterized by diversification of their GDP structure, where the oil exports are not the main source of income. Therefore, the researcher expects that the GDP variable in these countries will have a significant effect that leads to an increase in the size of foreign trade with Saudi Arabia.

Source: By the researcher depending on Table 4.

Figure 5: Size of Saudi's GDP compared with non-GCC countries
1998-2008, Million USD

5.1.2 Rate of transportation cost

This variable is a major determinant of the movement of foreign trade flows between countries, and is used as an independent variable in the gravity model instead of the distance variable. The economic literature often refers to the foreign trade flows being larger between nearby countries, or geographically close.

Table 5: The Distance between Saudi Arabia and selected countries
(kilo metres)[*]

UAE	775	Bahrain	426
Oman	1213	Qatar	453
Kuwait	537	UK	5272.5
Australia	11005.3	Brazil	11352.9
Malaysia	6472.8	Turkey	1918.0
Iran	1271	-----	----

Source: www.geobytes.com
   (*) Calculated based on the distance between the capital city of Saudi Arabia
       and the capital cities of the other countries.

By using the data of Saudi's foreign trade, we note that the main non-GCC trade partners of Saudi Arabia over the period 1998-2008 are the United Kingdom, Australia, Iran, Turkey, Brazil and Malaysia. In addition, we have selected these countries because they are located in different geographical are as of varying distance. The following table shows the distance between Saudi Arabia and other countries, which will be used to account for the rate of transportation cost in the gravity model of this study.

Table 5 shows the distance between Saudi Arabia and other countries, where the GCC countries are the nearest countries to Saudi Arabia, while of the foreign countries, Iran comes as the closest foreign country to Saudi Arabia, followed by Turkey, the United Kingdom, Malaysia, Australia and Brazil, respectively.

In this study, the researcher has substituted the distance variable as the constant variable with the measurable quantitative variable represented by the rate of transportation cost. The distance between countries does not change over time, so by using the rate of transportation cost we can examine it over the study period, whereas the cost of the rate for the countries that use land transport is about USD 3.450 dollar per one kilometre (Nuno, 1999, p. 5), and about USD 4.620 dollar per one kilo metre for the cost of sea transport (Ibid, p. 8). Moreover other studies report that the transportation costs are changing at a rate 0.0094 per year (Aljubory, 2010, p. 117). Therefore, we will use different values in our study that includes all the period 1998-2008. We have calculated the cost of transport as follows:

Cost of land transport = 3.450 USD per kilometre. (Between Saudi Arabia, GCC countries and Turkey)

Cost of sea transport = 4.620 USD per kilometre. (Between Saudi Arabia and selected non-GCC countries)

Where:
Cost of transportation between Saudi Arabia to GCC countries, and Turkey will be as the follows:

Transportation cost rate (at the first year) = Distance * (3.450) = cost of transport (First year "1998") after that we will multiply it by (0.0094) for obtaining the transport cost of the second year (1999), and so on.
In respect of the transportation cost between Saudi Arabia and non-GCC countries except Turkey, it has been calculated as follows:

Transportation cost rate (at the first year) = Distance * (4.620) = cost of transport (first year "1998"), after that we can calculate the cost rates of the following years by using the previous method.
By using the formulations above, the researcher has obtained the transportation cost rate of period 1998-2008, as shown in Table 6.

Table 6: Transportation Cost rate between Saudi Arabia and other countries
          (Thousand USD)

Years	UAE	Bahrain	Oman	Qatar	Kuwait	Iran
1998	2674	1470	4185	1563	1853	5872
1999	2699	1484	4224	1578	1870	5927
2000	2724	1498	4264	1593	1888	5983
2001	2750	1512	4304	1608	1906	6039
2002	2776	1526	4344	1623	1924	6096
2003	2802	1540	4385	1638	1942	6153
2004	2828	1554	4426	1653	1960	6211
2005	2855	1569	4468	1668	1978	6269
2006	2882	1583	4510	1684	1997	6328
2007	2909	1598	4552	1700	2016	6387
2008	2936	1613	4595	1716	2035	6447
Years	UK	Brazil	Aus.	Turkey	Malaysia	
1998	24359	52450	50845	6617	29904	
1999	24588	52943	51323	6679	30185	
2000	24819	53441	51805	6742	30467	
2001	25052	53943	52292	6805	30753	
2002	25287	54450	52783	6869	31042	
2003	25525	54962	53279	6933	31333	
2004	25765	55479	53780	6998	31627	
2005	26007	56000	54285	7064	31924	
2006	26251	56526	54795	7130	32224	
2007	26498	57057	55310	7197	32527	
2008	26747	57593	55830	7264	32833	

Source: Accounted by the researcher.

5.1.3 Foreign trade commodity variable

The importance of foreign trade comes from its role in enhancing the economic relationships between countries, which shows the outcome of various economic activities. The following table presents the reality of intra-regional trade of Saudi Arabia with the rest of GCC countries over the period 1998-2008.

Table 7: Saudi's trade with the rest of GCC countries (Million USD)

Year	UAE	Bahrain	Oman	Qatar	Kuwait
	Total trade	Total trade	Total trade	Total trade	Total trade
1998	1745.43	1405.65	214.55	228.41	563.36
1999	1783.53	1669.21	233.73	240.54	552.34
2000	2654	18744.1	316.4	398.2	893.4
2001	2556	2069.5	308.0	390.9	848.3
2002	2880.9	2119.3	303.99	256.55	780.3
2003	2616.33	2088.51	309.93	352.17	761.3
2004	3023.43	2974.18	318.9	428.85	1017.39
2005	4573.5	4712.34	508.29	617.81	1114.07
2006	8710.6	6748.2	633.7	1282.2	1524.1
2007	9581.2	7360.2	727.0	1406.7	1626.6
2008	11656.9	10618.1	1168	1783.1	1812.5
Average 98-2008	4707.43	5500.84	458.40	671.40	1044.80

Source: Database of Arab Monetary Fund (AMF): http:// www.amf.org.ae

In respect of the foreign trade of Saudi Arabia with non-GCC countries, we can see it in the following Table 8.

Table 8: Saudi's foreign trade with non-GCC countries, 1998-2008 (Million USD)

Year	Iran	Turkey	Brazil	Australia	UK	Malaysia
	Total trade	Total trade	Total trade	Total trade	Total trade	Total trade
1998	195.09	1256.56	1612.99	1017.7	3545.22	438.94
1999	135.65	971.08	1032.69	867.57	2882	358.12
2000	75.5	789.61	1055.99	1029.96	3544.95	498.91
2001	67.7	1102.03	1447.61	1639.57	3569.35	883.31
2002	201.4	1184.66	1398.27	1310.82	2870.43	933.98
2003	304.34	1267.28	1262.37	1457.21	2662.54	739.28
2004	338.63	1442.19	1488.87	1640.65	3851.95	839.44
2005	695.13	1809.46	2112.19	2103.66	4736.53	1414.17
2006	982.34	2578.77	2736.1	2750.48	6001.26	1990.37
2007	1202.7	3128.75	3263.62	2818.38	5614.58	2701.33
2008	1418.74	2363.72	3334.73	2646.95	5556.51	2584.52
Average 98-2008	**510.65**	**1626.73**	**1885.94**	**1752.99**	**4075.93**	**1216.579**

Source: Data base of World Bank: http://www.worldbank.org.

Table 8 shows the increased level of Saudi's foreign trade commodity during the study years, especially with Iran, Brazil, Australia and the UK. We have previously seen the significant level of intra-regional trade between Saudi Arabia, UAE, and Bahrain in comparison with the rest of the GCC countries.

5.2 Formulation of the model

We will use the linear logarithmic formulation of duration 1998-2008.We will examine it by using OLS and Panel Data method, as in the following model:

$$\text{Log}(\text{Trade}_{ijt}) = a + B_1 \text{Log}(\text{GDP}_j) + B_2 \log(\text{Cost}_{ijt}) + u_i$$

where

Trade_{ijt} : foreign trade between country i (Saudi Arabia) and country j over the period t.

GDP_j : Gross domestic product of country j.

Cost_{ijt} : rate of transportation cost between country i and country j over the period t.

u_i : Error term.

5.3 Expected signals of independent variables

Based on the theoretical hypotheses of the gravity model, the signals of estimated coefficients of GDP must be positive.

Table 9: Expected signals of independent variables for the gravity model

Country	Independent Variable	Expected signal
UAE	GDP.UAE / Cost.UAE	+ -
Bahrain	GDP.BH / Cost.BH	+ -
Oman	GDP.O / Cost.O	+ -
Qatar	GDP.Q / Cost.Q	+ -
Kuwait	GDP.Kw. / Cost.Kw	+ -
Malaysia	GDP.My / Cost.My	+ -
Turkey	GDP.Ty / Cost.Ty	+ -
Iran	GDP.Ir / Cost.Ir	+ -
United Kingdom	GDP.Uk / Cost.Uk	+ -
Australia	GDP.Aus. / Cost.Aus.	+ -
Brazil	GDP.Brz / Cost.Brz	+ -

Source: Prepared by the researcher.

To show the positive effect of increasing this variable in rising the foreign trade level between the countries of study. In contrast, the estimated coefficient of transportation cost rate must be negative signals to reflect the inverse role of distance that increases the cost of transport, which reduces the size of trade flows between countries, as shown in Table 9.

5.4 The Model estimation

Based on available data, and by using SPSS program with Panel Data method, the gravity model was estimated for the period 1998-2008. We obtained the following model.

Table 10: Regression results for the gravity model [*]

Country	Model	Unstandardized Coefficient		t	Sig.
GCC		B	Std. Error		
UAE	(Constant)	7.512	0.095	79.268	0.000[**]
	GDPUAE	1.318	0.200	6.600	0.000[**]
	Cost.UAE	-1.821	0.290	-6.274	0.000[**]
Bahrain	GDP.Bh	1.312	0.247	5.317	0.000[**]
	Cost.Bh	-1.558	0.313	-4.980	0.000[**]
Oman	GDP.O	1.295	0.244	5.302	0.000[**]
	Cost.O	-1.746	0.296	-5.908	0.000[**]
Qatar	GDP.Q	0.994	0.142	6.990	0.000[**]
	Cost.Q	-1.547	0.198	-7.815	0.000[**]
Kuwait	GDP.Kw	0.714	0.182	3.925	0.000[**]
	Cost.Kw	-1.115	0.263	-4.233	0.000[**]
Non- GCC					
Malaysia	GDP.My	2.084	0.320	6.514	0.000[**]
	Cost.My	-2.413	0.361	-6.677	0.000[**]
Turkey	GDP.Ty	0.941	0.242	3.889	0.000[**]
	Cost.Ty	-1.384	0.350	-3.951	0.000[**]
Iran	GDP.Ir	2.633	0.257	10.238	0.000[**]
	Cost.Ir	-3.816	0.354	-10.795	0.000[**]
UK	GDPUk	1.079	0.462	2.336	0.021[***]
	Cost.Uk	-1.463	0.659	-2.222	0.028[***]
Australia	GDP.Aus	1.102	0.302	3.643	0.000[**]
	Cost.Aus	-1.349	0.367	-3.671	0.000[**]
Brazil	GDP.Brz	1.032	0.268	3.847	0.000[**]
	Cost.Brz	-1.289	0.334	-3.859	0.000[**]

Source: Prepared by using SPSS software and Panel Data technique.
 (*) Trade is the dependent variable of the model and all values are in natural logarithmic.
 (**), (***) Indicate statistically significant at the (1%) and (5%) levels, respectively.

$$R^2 = 0.921, \quad \text{adj. } R^2 = 0.905, \quad F = 57.754 \qquad P = 0.000 \qquad D.W = 1.637$$

By the model above, it can be seen that all the coefficients are statistically significant at the 0.01 level, except the United Kingdom, the coefficients of which are statistically significant at the 0.05 level. This result confirms the effectiveness of the model variables to influence the foreign trade between Saudi Arabia and other countries, in other words, the confidence interval that represents the economic relations in this model between (0.99 – 0.95). Moreover, the (F) value is statistically significant at the 0.01 level, which is about 57.754, and the D.W value is about 1.637, confirming that the estimated model is located in the accepted statistics area. In other words, this model has been estimated without any auto-correlation problem; therefore, we can depend on it economically for analysing the foreign trade commodity flows between Saudi Arabia and the eleven other countries over the period 1998-2008.

5.5 Results Analysis

UAE: The signals of independent variables of the gravity model between Saudi Arabia and the UAE are compatible with our expectations, as shown in Table 9. The researcher found that the gravity model between the said countries are significant, where increasing GDP by one time leads to increase foreign trade commodity about 1.318 times. Saudi's exports to the UAE amounted to about USD 3,709.3 million (AMF, 2009), on average, for the study period, which represents 79% of the average of total trade between the two countries. In this regard we can say that Saudi's Exports have a significant role in enhancing the intra-regional trade of theUAE, which is attributed to the important role of GDP growth over the study period.

In respect of the cost transportation rate, the researcher notes from the obtained results that increasing the cost rate of transport in one time leads to a decrease in the foreign trade between the two countries of (1.821) times. This result is compatible with the theoretical hypotheses of the gravity model, in which the negative relationship between the transport cost rate and foreign trade flows reflect the inverse relationship between the size of trade and distance between countries.

In addition, and in this context, it should be noted again, that the volume of intra-regional trade was significant between Saudi Arabia and the UAE over the same period of study. This fact is clear if we go back to what was discussed previously by using the trade intensity index, where we noted that both Saudi Arabia and the UAE have obtained positive signals. Using the gravity model reflects the same findings in terms of its content, and confirms the deep economic relationships between the two countries, in which the impact of GDP is considered as a major

determinant in increasing the level of foreign trade. In contrast, the rising cost of transportation rate has a significant role in reducing the trade level.

Bahrain: The result that we obtained by the model is converging with the result of the UAE, which is mentioned above. The estimated model shows that increasing the GDP in Bahrain by one time will lead to an increase in the intra-regional trade with Saudi Arabia about 1.312 times. The main reason for this is the role of Saudi's commodity exports to Bahrain. Bahrain depends too much on its imports from Saudi Arabia. However, Saudi Arabia has increased its foreign trade level with Bahrain over the period of study.

The data shows that the average of Saudi's exports to Bahrain amounted to about USD 5,124.92 million over the period 1998-2008, (AMF, 2010), which is considered the largest value compared with Saudi's export to the other GCC countries. We note that Saudi's imports from Bahrain amount to about USD 375.92 million (Ibid) on average for the period 1998-2008, which means there is a significant commercial relationship between the two countries, and that there is a high reliance of the Bahraini economy on its imports from Saudi Arabia.

The coefficient of transportation cost rate is a negative value, which confirms that the increasing transportation cost rate in one time leads to a drop in the value of foreign trade of about 1.558 times, and is a key factor that determines the trade between the two partners.

Oman: Oman comes in the third level, after the UAE and Bahrain, in terms of the effect of the gravity model on foreign trade with Saudi Arabia. The estimated model indicates that the increase of Omani GDP in one time leads to an increase of foreign trade between the two countries of about 1.295 times, which confirms the economic relationship. In this context and to enhance the result of the gravity model, we note from Table 3 that the ratio of intra-regional trade of Oman has dominated at 14.6%, on average, of the total of foreign trade of Oman with the world, and that this ratio represents a significant percentage compared with other GCC countries. In addition, the percentage of intra-regional imports of Oman was about 15% of the total intra-regional trade in GCC countries for the period 1998-2008, as shown in Table 2. These facts strongly agree with the estimated model, where there was an increase in the intra-regional trade level from Saudi Arabia towards Oman over the study period.

The model also confirms the inverse relation between transportation cost rate and the level of Omani foreign trade, where increasing the cost rate in one time leads to reducing the level of trade about 1.746 times, where Oman comes after the UAE in terms of the rate of transport cost with Saudi Arabia.

Qatar: The gravity model result indicates that Qatar is ranked in the fourth level in terms of its gravity foreign trade with Saudi Arabia, where increasing the GDP of Qatar by one time leads to an increase in the intra-regional trade of about 0.994 times. This result reflects the weakness of the trade relationship between the two countries compared with the rest of the GCC countries mentioned previously, (UAE, Bahrain and Oman).The main reason for this weakness is attributed to the Oil and Gas exports of Qatar, which constitute a large ratio of Qatar's GDP. In

other words, there is a similarity in the pattern of production structure, which leads to a low level of intra-regional trade between Qatar and Saudi Arabia. Moreover, the second reason, as we have noted previously is that Qatar depended too much on its intra-regional trade with the UAE during the period 1998-2008.This can be seen in Table 1, which indicates that the average of Qatari exports to the UAE amounted to USD 752.0 million per year, while its exports to Saudi Arabia were about USD 200.2 million. In addition, in regard of Qatari imports, we note that the average of its imports from Saudi Arabia was about USD 599.93 million while the average of Qatari imports from the UAE was about USD 711.36 million, which means that Qatar's insignificant trade relation with Saudi Arabia was as much as its relation with the UAE. In this regard we can explain that the main reason is that the UAE is the closest neighbour. The distance between Qatar and the UAE is about (338) kilometres, while the distance between Qatar and Saudi Arabia is about (453) kilo metres. The variable of transport cost rate indicates that increasing it by one time leads to a decrease of foreign trade of about (1.547) times, which assures us that there is an inverse relationship between distance and foreign trade flows between the said countries.

Kuwait: The gravity model shows a low level of intra-regional trade with Saudi Arabia, where increasing the Kuwaiti GDP in one time leads to an increase in the trade flows with Saudi Arabia of about 0.714 times, which reflects the insignificant role of foreign trade between them compared with other members of GCC countries. This fact will be evident if we go back to the trade intensity index of Kuwait for which the index value was (-0.0409).The gravity model confirms this fact, showing similar results in terms of content. Also, the data in Table 3 shows this issue clearly, where the ratio of intra-regional trade was only 4% of the total of intra-regional trade in GCC countries for the period 1998-2008.

In addition, the variable of transportation cost rate indicates its inverse relationship with the foreign trade commodity. The low level of trade between Saudi Arabia and Kuwait indicates that this trade is characterized by the increased transport cost per one unit. Because an increase in the rate of transportation cost by one time leads to a reduction in the foreign trade of about 1.115 times, this confirms the rising rate of cost compared to the foreign trade flows between Saudi Arabia and Kuwait.

Malaysia: The estimated model reflects that the foreign trade commodity between Saudi Arabia and Malaysia has a significant role, where the model indicates that an increase of Malaysian GDP by one time leads to an increase in the foreign trade flows of about 2.084 times between the mentioned countries despite the geographical distance and consequent rising cost of transportation. This result confirms that the size of GDP represents a high importance compared with the distance between countries. In other words this result reflects the level of economic diversification and, thus, a possibility for more foreign trade. This fact agrees with the result that we reached previously, which confirms that the weakness of intra-regional trade between the GCC countries is because the pattern of their trade is competitive with each other.

Moreover, the variable of transportation cost rate indicates the inverse relations with the size of foreign trade commodity, which is compatible with the economic logic, where increasing the cost rate by one time leads to dropping the size of foreign trade commodity about 2.413 times. The transport cost rate has a significant role that hinders the foreign trade between Saudi Arabia and Malaysia.

Turkey: The result that we obtained by using this model shows that the increasing level of GDP of Turkey by one time leads to an increase in the foreign trade level with Saudi Arabia of about 0.941 times, which reflects a modest trade relationship between the two countries compared with Saudi's foreign trade with Malaysia.

The variable of transportation cost rate shows the inverse relationship with the foreign trade, where increasing the cost of transportation in one time leads to a drop of foreign trade of about 1.384 times.

Iran: In the case of Iran, the estimated model confirms a positive role of GDP to enhance the foreign trade level with Saudi Arabia. The result of the model confirms the importance of trade relationship between the two countries and that it is more significant than its trade relation with Turkey. The model indicates that increasing the GDP in Iran by one time leads to an increase of its foreign trade with Saudi Arabia of about 2.633 times.

In respect of the transportation cost rate variable, the model shows that increasing it by one time will lead to a reduced level of foreign trade between Saudi Arabia and Iran of about 3.816 times, which confirms that the cost of transport has a significant role to negatively effect the level of foreign trade between the two countries.

United Kingdom: In respect of the UK, the gravity model shows that an increase in the GDP of the UK by one time enhances the level of foreign trade by about 1.079 times, while the coefficient of transportation cost rate indicates that increasing it by one time leads to a drop of foreign trade between Saudi Arabia and the UK by about 1.463 times.

Australia: The estimated model indicates that increasing the GDP of Australia by one time leads to an increase in the level of foreign trade by 1.102 times, which means that the role of GDP positively affects the size of foreign trade between the two countries –Saudi Arabia and Australia. Moreover, the transportation cost rate shows its negative relation with foreign trade flows, where the gravity model shows that an increase in the cost rate by one time leads to a decrease in foreign trade between the two partners of about 1.349 times. This reflects the role of transportation costs as a major determinant that negatively affects the foreign trade flows.

Brazil: The estimated model confirms the positive role of GDP in Brazil to affect the size of foreign trade commodity with Saudi Arabia. An increase in the GDP of Brazil by one time leads to an increase in foreign trade between the two countries of about 1.032 times, which confirms the role of GDP in enhancing the level of foreign trade between them.

Moreover, the coefficient of transportation cost rate indicates that increasing it by one time will induce a drop in foreign trade level between Saudi Arabia and Brazil of about 1.289 times.

5.6 Potential of Saudi's foreign trade

Based on the coefficients of the gravity model, we estimated Saudi's trade potential with the rest of the GCC and selected non-GCC countries; the foreign trade potential (P), as predicted by the model and actual trade (A), by using the average of logarithmic values for the study period, 1998-2008. If the value of (P/A) exceeds one, this implies that there is a potential for expansion of foreign trade with the countries in the model. The following table shows Saudi's estimated foreign trade potential with other countries.

Table 11 shows that the foreign trade of Saudi Arabia is significant with Iran, followed by Oman, Qatar, Australia and Malaysia, and that Saudi Arabia can increase its trade to the mentioned countries by (1.0) time in logarithmic values. In addition, the gravity model shows no trade potential with the UAE, Bahrain, Kuwait, Turkey, the UK and Brazil, meaning that, currently, Saudi Arabia is over traded with the countries that have no potential, as they are the largest trading partners of Saudi Arabia.

Table 11: Saudi's trade potential with GCC and non-GCC countries, Average 1998-2008

GCC	Actual trade (A)	Potential trade (P)	P/A
UAE	8.232971	8.228984817	0.999515838
Bahrain	8.262903636	8.262077631	0.99900034
Oman [*]	5.9876	5.990919578	1.000554409
Qatar [*]	6.254885	6.258143429	1.000520869
Kuwait	6.876873	6.870428023	0.999062844
Non-GCC	Actual trade (A)	Potential trade (P)	P/A
Malaysia [*]	6.882597	6.882883709	1.000041617
Turkey	7.30545	7.303866885	0.999783297
Iran [*]	5.760769	5.764470622	1.000642541
UK	8.274217	8.101740455	0.979154908
Australia [*]	7.390236	7.391945736	1.000231301
Brazil	7.457085	7.449276509	0.998952815

Source: Prepared by the researcher based on data from the study and the gravity model.
    (*) Significant potential trade.

6 Conclusions

Based on the analytical approach and gravity model results we have reached the following conclusions:

1. The economic openness in GCC countries and their high dependency on commodity imports over a period 1998-2008 shows clearly that the fluctuations in the trade balance are related to the export values more than the fluctuations that occur in the import values because of the significant role of oil exports and its related industries.

2. The weakness of intra-regional trade in GCC countries indicates the insignificant role of non-oil industries, and the high reliance on the oil sector and certain related industries that have a similarity in the investment pattern and production. These industries are becoming increasingly competitive with other non-GCC countries. Therefore non-oil industries in GCC countries did not have a positive effect on improving the level of intra-regional trade during the period 1998-2008.

3. The low level of intra-regional trade confirms that the intra-investment in GCC countries does not have an important role towards reinforcing the integration industries that can improve intra-trade. In addition, it implies the lack of coordination of investment policies, which, in turn, reflects the failure of the unified economic policy that was adopted by the GCC bloc since 1981.

4. Saudi Arabia is considered the hub market of GCC countries due to its positive intra-trade intensity, where the indicator amounted to about 0.0742 during the period 1998-2008.It is considered as the main economy compared with the rest of the GCC countries.

5. The actual foreign trade commodity between Saudi Arabia, Qatar and Oman were less than Saudi's potential trade, while Saudi's actual trade with the UAE and Kuwait was more than expected. This result is attributed to the size of the economy, where the UAE and Kuwait represent the second and third level, respectively, in terms of size of GDP compared with the rest of the GCC countries. Therefore, they have high actual foreign trade compared with their potential.

   In respect of Qatar and Oman, we can say that these economies are smaller than the other GCC economies except Bahrain, which depends too much on its trade with Saudi Arabia. Furthermore, it is geographically closer to Saudi Arabia in comparison with the rest of the GCC countries.

6. Saudi's actual foreign trade with United Kingdom, Turkey and Brazil is more than expected. According to this result, we can say that the distance between Saudi Arabia and the countries mentioned above has an insignificant role in determining the foreign trade flows, where the size of GDP is the main factor that determines the direction of the trade between Saudi Arabia, the United Kingdom, Turkey and Brazil.

7. The actual foreign trade commodity between Saudi Arabia, Malaysia, Iran and Australia is less than its potential because of the small size of GDP compared

with that of Turkey, the United Kingdom and Brazil. Saudi Arabia tends to trade more with large economies. Therefore, the study again confirms that distance is not an important factor in the case of Saudi Arabia and the rest of the GCC countries, where Iran is the closest foreign country to Saudi Arabia, while Brazil is further geographically. However, the foreign trade commodity of Saudi Arabia with Brazil is larger than Iran. In this context, we note from the size of GDP of the two countries, Brazil and Iran, that the Brazilian GDP is more significant than the Iranian GDP, which justifies the important role of foreign trade between Saudi Arabia and Brazil.

8. There is a significant relation between Saudi's foreign trade and the size of GDP of non-GCC countries, which reflects the main reason for the increase in foreign trade flows among them. This result confirms that the size of GDP has a more significant role as a major determinant of foreign trade flows.

9. The GDP coefficients are considered more important than the transportation cost rate between Saudi Arabia, and other GCC countries, which is constrained by problems of similar comparative advantages, where we have found that the actual Saudi trade flows with distant countries like the UK, Turkey and Brazil was more than nearby countries like Oman and Qatar.

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