



Journal of Applied Sciences

ISSN 1812-5654

science
alert

ANSI*net*
an open access publisher
<http://ansinet.com>

Determinants of the Real Exchange Rate as a Prerequisite for the GCC Monetary Union

¹Hassan Al-Hajhoj, ²Abdulrazzak Charbaji and ³Mohammad Safarzadeh

¹Department of Economics, School of Business, King Faisal University, Saudi Arabia

²Olayan School of Business, American University of Beirut, Lebanon

³Department of Economics, University of Southern California (USC), USA

Abstract: Monetary union plays an important role in introducing a single currency among the member states in a similar geographical region. It is therefore, necessary to analyze economic factors that lead to the establishment of monetary union in the Gulf Cooperation Council (GCC) through real exchange rate. The main aim of this study was to investigate the determinants of the Real Exchange Rate (RER) across the Gulf Cooperation Council (GCC) countries as a prerequisite for establishing a monetary union. To achieve this goal, different econometric techniques such as the Vector Error Correction (VEC) etc., were applied. Firstly, each relevant economic variable was tested according to the standard Augmented Dickey-Fuller (ADF) unit root test in order to be able to apply. Secondly, the Engle-Granger two-step co-integration method was applied to determine the appropriateness of using the VEC for each GCC country. The results indicated that the most economic variables in the study have one order of integration. The study also showed that GCC countries have different economic variables that determine the RER. The study results indicated that the estimated error correction coefficients were not significant for all the GCC countries except the state of Qatar where the growth in RER will deviate by -0.240808 in the short term. The study highlighted the various determinants of RER helpful to establish monetary union in the GCC countries.

Key words: Co-integration, GCC countries, regression, real exchange rate, vector error correction

INTRODUCTION

The Gulf Cooperation Council (GCC) was established in May 1981 among the six Arab countries of the Gulf region namely Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates (UAE). One of the major objectives of establishing the GCC was to unify the states economically through the establishment of a monetary union. Therefore, this study investigated and analyzed the key economic determinants of the Real Exchange Rate (RER) in the GCC countries as a guideline to establish the expected GCC monetary union, because the RER plays a significant role in the growth of an economy. The ultimate aim of this monetary union was to introduce a single currency into the member states. There was a support for the introduction of this single currency as the member countries of the GCC's monetary union share similar characteristics such as the region's common history, the language, the relative homogeneity between the political systems and traditions and most importantly the similarity in economic structure among the member states. The economic structure of all the GCC member states is strongly dominated by the production of oil and gas. In order to adopt a single currency, the GCC countries were building up monetary convergences over recent decades

as revealed by the high degree of exchange rate stability, predominantly low inflation rates and co-moving interest rates.

There have been several theoretical and empirical studies of the RER in developed and developing economies. In this study, the researchers faced the challenge of determining the economic factors that will affect the RER of each GCC country. The researchers tried to find the common factors among the six GCC countries that will lead to the development of a monetary union within the GCC countries. Therefore, some of the studies that tried to specify the determinants of RER were summarized as follows.

According to Bruno (1976), the RER depended on the domestic interest rate, an excess of domestic demand and a current account deficit. While Obstfeld (1984) reported the factors that affect the RER in the long term, such as the removal of capital control, excess domestic demand and the size of the current account. Edwards (1988) applied an econometric model to 12 developing countries from 1962-1985 and found six economic factors that affected the RER in the long term. These factors included the capital accumulation, the exchange of trade controls, control of capital flows, government consumption, technological progress and the terms of trade. The signs

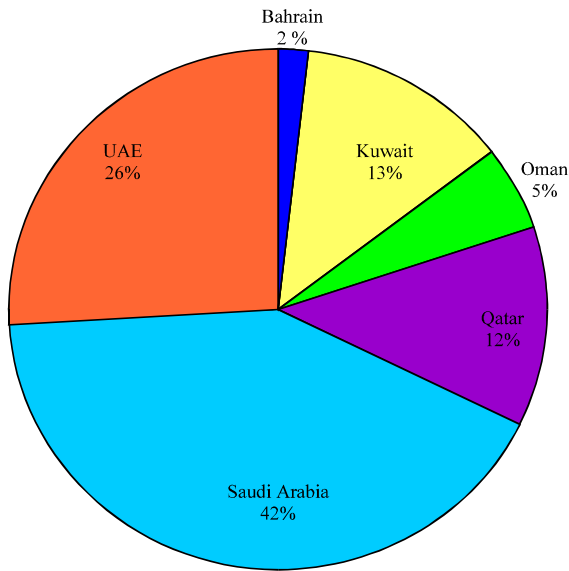


Fig. 1: GDP in GCC countries, current prices, Billion Dollars in 2011. Source: IMF (2012b)

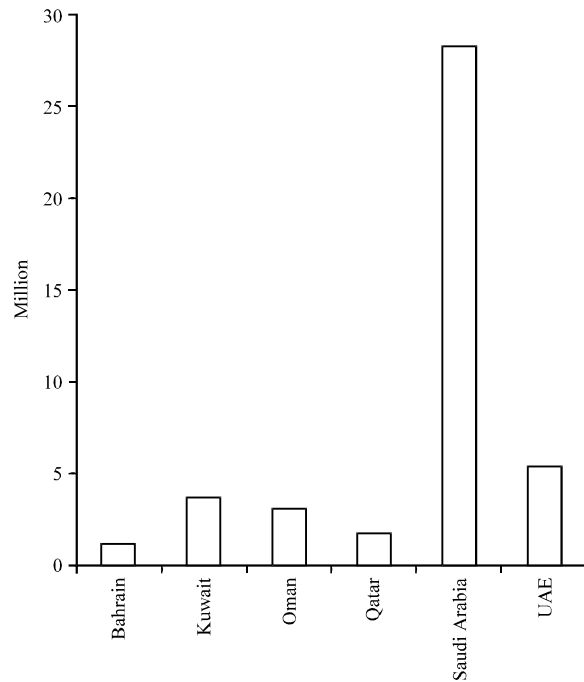


Fig. 3: Population in GCC countries in 2011. Source: IMF (2012b)

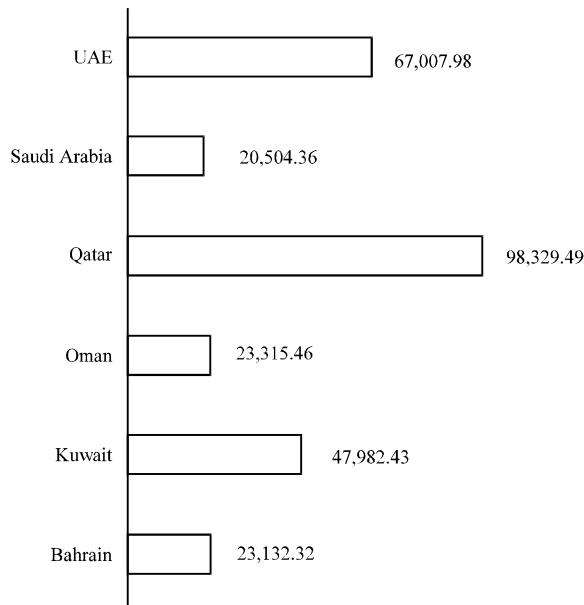


Fig. 2: GDP per capita in GCC countries, US Dollars, 2011. Source: IMF (2012a)

of trade and the degree of openness of the economy as determinants of the RER (Ghura and Greenes, 1993; Aron *et al.*, 1997).

Overall, the population of GCC countries was 43.2 million in 2011. Figure 1 shows that Saudi Arabia represents 65% of the total population of the GCC countries comprising around 28 million inhabitants. The GDP of the GCC countries reached 1,386 trillion dollars in 2011. Figure 2 illustrates that Saudi Arabia and the UAE have the largest share of the GDP among the GCC countries representing 42 and 26%, respectively. The UAE is the second largest country in terms of population and GDP (Fig. 1 and 2). Figure 2 also shows that Bahrain had the lowest share of GDP representing only 2% of the total GDP of the GCC countries. However, in terms of GDP per capita, Fig. 3 demonstrated that the population plays an important role in the size of the GDP per capita. For example, a country with a high overall GDP might have low GDP per capita due to the size of the population. For example, Overall the GDP of Saudi Arabia is the highest, but it is the lowest GDP per capita among the GCC countries. Figure 3 shows that the GDP per capita of Qatar was the highest among the GCC countries as well as in the world in 2011 due to the fact that its economy grew by almost 19%. The State of Qatar was considered to be the fastest growing economy worldwide (World Bank, 2012). Furthermore, all the GCC economies still depend heavily

Table 1: Percentage change in gross domestic product and constant prices (2000)

Years	Bahrain	Kuwait	Oman	Qatar	Saudi Arabia	UAE
2000	5.23	0.13	4.65	10.94	4.87	12.33
2001	4.62	0.67	5.56	6.32	0.55	1.85
2002	5.19	2.85	2.08	3.20	0.13	-0.74
2003	7.25	17.41	0.34	6.32	7.66	16.39
2004	5.64	11.17	3.42	17.72	5.27	10.14
2005	7.85	10.36	3.98	7.49	5.55	8.60
2006	6.65	5.26	6.91	26.17	3.16	8.85
2007	8.38	4.46	5.34	17.99	2.02	6.55
2008	6.31	4.97	12.86	17.66	4.23	5.32
2009	3.08	-5.15	1.12	11.96	0.10	-3.28
2010	4.51	3.42	3.97	16.64	4.64	0.88
2011	1.79	8.20	5.48	18.82	6.78	4.90

Source: IMF (2012a)

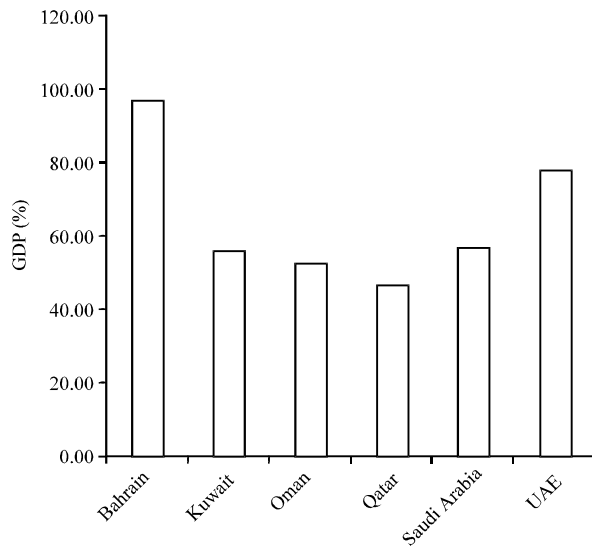


Fig. 4: Exports of goods and services (% of GDP) in GCC countries, 2010. Source: World Bank (2012)

on exports, especially of oil and gas. Figure 4 shows the export of goods and services as the percentage of GDP ranging from 46% in Qatar to 96% in Bahrain. This indicates the important role of trade openness in the development process of the GCC economies. It is also important for the exchange rate mechanism and for currency unification.

In addition to the aforementioned factors, the analysis highlighted certain economic and financial indicators of the GCC countries from 2000-2011. The change in the real GDP of the GCC countries is presented in Table 1. It can be visualized from the data in Table 1 that most of the GCC economies enjoyed positive growth, especially during the period from 2003-2008. The prosperity of the GCC economies may be attributed to the recovery of the world economy which, in turn, increased the demand for oil products. Therefore, the increase in oil production and high oil prices are reflected in the growth of the GCC economies. Table 1 indicates that Qatar

observed the highest growth rate in GDP (26.17%) in 2006. Also, The State of Qatar showed the highest growth rate in real GDP among the GCC economies from 2000-2011. In 2008, Oman became second in terms of real GDP growth. In spite of the high rate of growth in the real GDP across the GCC economies in 2008, The year 2009 saw a considerable drop in the real GDP growth rate for all GCC economies. Kuwait and the UAE faced negative growth in their economies (-5.15 and -3.28%, respectively). However, the following years showed an improvement among all the GCC countries. Of course, the international financial and economic crises in 2008 affected all of the GCC countries and this is evident in the performance of the GCC economies in 2009. The effect of the international economic crisis did not come as a surprise on the GCC economies because the GCC countries depend heavily on international trade. Thus, any downturn in the world economy will affect the GCC economies through the trade sector. The growth rate of the real GDP in the GCC countries ranged, on average, from 9.3% (2006) to 1.3% (2009). While, the average growth rate of the GCC economies was almost 5.8% from 2000-2011 and was considered high as compared to the economy of other regions in the same period (IMF, 2012a).

Table 2 illustrates the trend in the inflation rate for the last decade in the GCC economies. The inflation rates in the GCC countries was very low from 2000-2004 except the State of Qatar in 2004. Indeed, some economies, such as those of Bahrain, Oman and Saudi Arabia showed negative inflation rates during the first two years of the last decade. But starting from 2005-2008, the inflation rate rose dramatically across all the GCC economies except Bahrain showed moderate inflationary pressures influencing the rates which ranged from 1.63% in 2003 to 3.53% in 2008. The inflation rate of Bahrain declined to 0.95% in 2011. The remainder of the GCC countries suffered from the inflationary pressures that appeared to affect the real GDP per capita thus reducing the real income of the countries' inhabitants. The inflation rate in most of the GCC countries in 2008 reached above 10% and

Table 2: Percentage change in inflation and average consumer prices

Years	Bahrain	Kuwait	Oman	Qatar	Saudi Arabia	UAE
2000	-0.73	1.57	-1.20	1.68	-1.13	1.35
2001	-1.18	1.45	-0.84	1.44	-1.12	2.80
2002	-0.50	0.80	-0.33	0.24	0.25	2.92
2003	1.68	0.99	0.17	2.26	0.60	3.12
2004	2.25	1.26	0.67	6.80	0.36	5.04
2005	2.62	4.12	1.85	8.81	0.63	6.20
2006	2.04	3.09	3.44	11.83	2.29	9.29
2007	3.25	5.47	5.89	13.76	4.12	11.13
2008	3.53	10.62	12.56	15.05	9.87	12.25
2009	2.79	3.95	3.54	-4.87	5.06	1.56
2010	1.97	4.01	3.26	-2.43	5.35	0.88
2011	1.00	4.75	4.03	2.00	4.98	0.88

Source: IMF (2012b)

Table 3: Percentage change in volume of imports of goods and services

Years	Bahrain	Kuwait	Oman	Qatar	Saudi Arabia	UAE
2000	11.74	-11.49	-0.14	-17.11	20.83	-0.92
2001	-7.70	6.98	-5.48	20.58	-3.18	4.18
2002	13.33	6.98	-15.65	5.91	3.63	4.47
2003	2.64	13.02	3.72	5.39	-1.18	10.94
2004	15.37	14.98	-7.20	10.13	11.55	20.14
2005	10.25	12.23	21.43	58.03	21.33	8.44
2006	0.86	4.71	15.96	46.26	20.11	10.96
2007	-3.45	29.53	25.13	21.22	18.15	34.11
2008	17.07	1.54	24.68	20.82	12.56	22.88
2009	-25.59	-21.06	-15.28	-0.45	0.40	-8.97
2010	4.58	13.69	8.17	11.07	1.45	-3.45
2011	-2.03	-0.98	5.46	-1.22	-0.39	15.91

Source: IMF (2012a)

was considered to be unprecedented. For example, in 2008, inflation reached 15.05, 12.52 and 12.25% in Qatar, Oman and the UAE, respectively. Moreover, the average inflation rate in all the GCC countries was 10.65% from 2000-2011. The rate of inflation started to decrease slowly from 2009-2011 due to the international financial and economic crises that affected the demand side of economies worldwide. Khan (2008) attributed the low and moderate inflation rate experienced from 2000-2004 to the imported monetary discipline embodied in the pegged exchange rate regime and which was underpinned by the open trade regime, the flexibility of the labor market, the existence of a prudent fiscal policy and the presence of benign global inflationary conditions. Also, Khan (2008) indicated that the policy of investing some of the oil export revenues outside the GCC countries' financial systems helped to contain the monetary expansion. On the other hand, the rising inflationary pressures in the GCC countries were due to increase in oil prices, the expansion of monetary policies and imported inflation (Alhajhoj, 2010). Whereas, Sturm *et al.* (2008) stated that:

- Common factors driving up inflation in GCC countries in recent years were: (1) Strong domestic demand accompanied by rapid money and credit growth, (2) Emerging bottlenecks in the economy caused by the economic boom, e.g., in the areas of construction and project management and (3) Rising prices of food and the raw materials (e.g., steel,

cement) which have been a global phenomenon. Rising import prices as a result of the US dollar pegs of GCC countries have also contributed to the increase in inflation, given that the US dollar has depreciated in recent years vis-a-vis most major currencies, including the euro and the pound sterling, the valuations of which are important for GCC countries' import prices as Europe is an important source of imports

Khan (2008) argued that the inflationary pressures in the last decade were also due to the depreciation of the US dollar against other major currencies as well as to a monetary policy that was tied to that of the US where the Federal Reserve's recent interest rate policy has highlighted the divergence in business cycles between the GCC countries and the US.

Table 3 illustrates the volume of imports of goods and services in the GCC countries as the percentage change. The data showed some fluctuations in the percentage change in the volume of imports, especially in the first few years of the last decade. There seemed some negative changes in the first and last few years of the last decade. These fluctuations supported the aforementioned rationale behind the trends observed in the rates of inflation. The data in Table 3 shows that the average percentage change in the volume of imported goods and services in the GCC countries reached its highest level of 20.78% in 2007. The increase in imports was primarily

Table 4: Percentage change in volume of exports of goods and services

Years	Bahrain	Kuwait	Oman	Qatar	Saudi Arabia	UAE
2000	19.88	14.46	4.83	-10.42	3.03	31.11
2001	-2.17	-0.67	4.03	17.91	0.72	1.51
2002	3.69	-11.96	0.25	-3.15	3.21	5.98
2003	3.28	31.41	-3.64	2.90	12.29	18.47
2004	13.38	8.13	4.17	26.58	4.86	23.69
2005	14.14	8.79	30.50	1.09	7.76	22.13
2006	7.49	0.31	10.72	8.59	0.20	17.91
2007	2.03	0.57	7.76	21.20	2.06	14.11
2008	5.13	-3.42	34.11	13.97	-1.20	20.09
2009	-13.38	-5.27	-18.40	5.41	-4.80	-10.28
2010	5.58	10.32	23.32	33.61	5.86	4.03
2011	-1.59	16.97	11.48	4.42	6.64	19.88

Source: IMF (2012b)

Table 5: Values of oil exports in US dollars (billion)

Years	Bahrain	Kuwait	Oman	Qatar	Saudi Arabia	UAE
2000	4.69	18.18	9.38	10.64	70.75	27.04
2001	3.68	14.97	8.88	9.91	59.69	23.91
2002	3.96	14.06	8.60	9.96	63.71	22.81
2003	4.68	19.57	9.32	12.15	82.13	29.18
2004	5.55	26.68	10.89	16.26	110.89	38.80
2005	7.78	42.44	15.73	22.86	161.78	55.08
2006	9.22	53.18	17.48	31.20	188.47	70.10
2007	10.79	59.06	18.73	39.79	205.59	73.83
2008	13.79	82.59	28.67	61.71	281.41	102.99
2009	8.91	46.62	18.07	42.33	163.28	68.15
2010	10.18	61.69	25.24	72.63	215.53	74.64
2011	12.92	100.87	31.44	97.95	302.29	111.60

Source: IMF (2012a)

due to the expansion of the GCC real economies that took place from 2004-2006. The rapid growth in real GDP increased demand to the extent that it could not be covered by the domestic supply alone and led to an increase in importing the goods and services to meet this gap. It is worth mentioning that Qatar had an average increase of 50% in the import volume of goods and services during 2005 and 2006. The international financial and economic crises showed some effects on the trends observed in the import volume in the GCC countries as visualized from the negative percentage change in import volume in 2009.

Regarding the volume of exports of goods and services, the export volume of the GCC countries increased from 321 billion dollars in 2005 to 654 billion dollars in 2008. However, in 2009, the export volume decreased to 443 billion dollars (GCC, 2011). Besides, most of the exports in the GCC countries depend heavily on oil and gas and the demand for oil and gas is affected by the GDP growth rate of the world. Between 2005 and 2008, the average global GDP growth rate was around 3.25% while in 2009, the growth rate of the world's GDP was -2.3% (WorldBank, 2012). Therefore, the volume of exports and services was affected by the world economy. Table 4 shows the percentage change in the volume of exports and services in the GCC countries. It demonstrates that the percentage change in exports and

services was at peak from 2003-2005. Table 4 also illustrates that all the GCC countries showed negative percentage changes in 2009 except Qatar which showed a positive percentage change in terms of the volume of exports. Therefore, the recession in the world economy negatively affected most of the GCC countries in the export sector because these countries heavily depend on oil exports representing almost three-quarters of their total exports. However, Qatar depends on gas exports more than oil exports and therefore, the world recession had little impact on its economy. However, in 2010, the percentage change of exports increased in all the GCC countries.

Furthermore, Table 5 analyzed the value of oil exports from 2000-2011 in the GCC countries. It is clear from the table that the value of oil exports in the GCC countries tended to increase from 2000-2008. However, in 2009, there was a drop in the value of exports in all the GCC countries. To analyze the trend in the value of oil exports, it is important to study the data relating to oil demand and oil prices. Worldwide oil demand increased from 76.87 million barrels per day in 2000 to 86.38 million barrels per day in 2008 (IEA, 2012). The world demand for oil dropped to 85.20 million barrels per day in 2009 due to the effect of the financial and economic crisis which led to the world economic recession. In 2010, the world demand for oil increased again and reached 87.36 million barrels per day

Table 6: General government total expenditure (Percentage of GDP)

Years	Bahrain	Kuwait	Oman	Qatar	Saudi Arabia	UAE
2000	25.11	35.72	35.73	31.49	35.61	21.46
2001	31.89	42.05	38.09	31.30	39.59	24.06
2002	36.02	41.87	39.28	30.69	38.85	21.17
2003	33.27	37.04	38.99	27.07	35.89	20.04
2004	30.50	34.20	39.20	28.40	36.10	17.91
2005	29.57	28.12	35.19	28.70	32.07	15.00
2006	28.15	31.91	34.77	28.16	31.96	14.63
2007	27.47	30.11	35.42	26.80	34.60	15.35
2008	27.45	40.41	29.49	24.65	31.61	17.50
2009	30.49	42.22	39.49	29.97	45.60	25.83
2010	32.74	41.47	34.36	28.15	42.04	24.28
2011	30.34	35.81	32.10	25.05	39.90	22.25

Source: IMF (2012b)

Table 7: Current account balance (Percentage of GDP)

Years	Bahrain	Kuwait	Oman	Qatar	Saudi Arabia	UAE
2000	10.62	38.89	15.94	23.24	7.60	16.07
2001	2.84	23.86	10.04	27.32	5.11	8.90
2002	-0.66	11.18	6.83	21.94	6.30	3.14
2003	2.02	19.70	2.38	25.26	13.07	5.59
2004	4.22	26.24	4.47	22.37	20.78	6.08
2005	10.97	37.21	16.75	29.88	28.54	12.39
2006	13.81	44.62	15.39	25.15	27.78	16.25
2007	15.74	36.79	5.88	25.38	24.26	6.87
2008	10.19	40.87	8.27	28.73	27.78	7.87
2009	2.90	24.43	-1.28	10.24	5.56	3.36
2010	3.43	29.64	8.81	26.33	14.81	3.07
2011	4.18	41.81	13.22	28.43	24.43	9.25

Source: IMF (2012a)

due to improvement in the world economy (the world GDP growth increased to 4.2%). The oil prices also followed the same trend as the world oil demand. Oil prices reached their highest level of \$91.48 per barrel. However, the price of oil decreased to \$53.48 per barrel in 2009 while in the following years the prices started to increase again and reached \$87.04 per barrel (IEA, 2012).

The GCC countries experienced good economic growth in the last decade up to now except for the year 2009 which followed the economic shocks experienced in 2008 due to the financial crisis. Table 1 shows the high economic growth in all the GCC countries. One major factor influencing the high rate of economic growth relates to demand. The government sector played an important role in increasing aggregate demand by using oil revenues to finance infrastructure projects. High government spending on infrastructure projects enhances the productivity of the private sector and consequently leads to economic growth (Voss, 2002; Ghassan and Alhajhoj, 2009). Table 6 shows that, on average, almost 30% of the GDP in the GCC countries from 2000-2011 was represented by government expenditure except the UAE. This indicates the importance of the government sector in the GCC countries, since all oil companies in these countries are government owned and given the fact that oil and gas revenues are used to finance the government sectors. However, the UAE depends on the private sector more than the government sector to enhance economic

productivity especially in the services sector. Sturm *et al.* (2008) stated that:

- The macroeconomic developments of recent years have provided a favourable backdrop for implementing reforms and addressing the structural challenges, particularly in providing GCC economies with the financial means. For example, to further develop physical and social infrastructure as a basis for private sector development. In the wake of high oil prices, real GDP growth has been buoyant. Non-oil GDP growth was impressive and even exceeded oil GDP growth, even if the dynamics of the non-oil sector remain largely driven by government expenditure which in turn depends on oil revenues. However, the GCC countries accumulated large fiscal and current account surpluses in recent years. The use of higher oil revenues has been prudent overall, with expenditure increases setting in only after it had become evident that the rise in oil prices might not be a temporary phenomenon and focusing on infrastructure development

The economic indicator of current account shows that the current account surpluses in the last decade in the GCC countries was due to high oil prices and oil demand which increased the oil revenues of the GCC countries. Table 7 illustrates that from 2000-2011, the average current account surpluses in the GCC countries

Table 8: Broad money (Percentage of GDP)

Years	Bahrain	Kuwait	Oman	Qatar	Saudi Arabia	UAE
2000	68.63	68.46	30.58	42.34	43.64	30.93
2001	75.69	81.17	32.79	53.70	47.08	37.35
2002	77.61	81.34	34.95	58.99	50.39	40.92
2003	73.18	70.26	33.78	51.99	49.42	40.98
2004	66.80	63.04	30.44	43.78	47.89	41.35
2005	63.15	52.50	27.41	42.81	43.75	43.15
2006	63.31	49.21	28.33	42.93	45.34	44.34
2007	69.52	53.53	32.77	44.89	50.48	50.89
2008	74.98	51.15	29.30	41.90	48.50	53.62
2009	89.41	74.36	42.79	55.76	70.72	71.26
2010	87.00	71.00	37.00	52.00	65.39	69.85
2011	*	55.00	34.00	46.00	54.00	*

*Unavailable data, Source: World Bank (2012). World Bank Indicators (WBI), Global Development Finance (GDF)

Table 9: Direction of trade (export and re-export) GCC intra trade million dollar

Years	Bahrain	Kuwait	Oman	Qatar	Saudi Arabia	UAE	Total
2006	1,230.26	880.14	2,356.30	1,797.47	6,979.48	5,021.39	18265.04
2007	1,779.55	1,184.75	3,296.08	1,792.31	9,102.41	6,186.36	23341.46
2008	2,309.23	1,551.94	5,009.05	1,172.52	9,872.86	8,730.86	28646.46
2009	1,768.11	1,382.90	4,404.84	2,069.37	9,809.59	9,070.48	28505.29

Source: GCC (2011)

Table 10: Direction of trade (imports) GCC intra trade million dollar

Years	Bahrain	Kuwait	Oman	Qatar	Saudi Arabia	UAE	Total
2006	975.80	2,467.89	3,342.16	2,159.51	3,269.06	4,797.96	17012.38
2007	1,111.80	2,280.30	4,821.55	3,320.20	3,852.53	4,855.38	20241.76
2008	1,606.20	2,666.99	7,175.42	3,995.70	4,973.58	6,996.33	27414.22
2009	1,192.32	2,281.26	5,337.82	3,894.74	4,678.65	5,864.56	23249.35

Source: GCC (2011)

ranged from 6.69% of the GDP in Bahrain to 31.27% in Kuwait. However, the overall average of the current accounts in the GCC countries during this period was 14.14%. The GCC countries have tended to invest current account surpluses in international investments such as sovereign wealth funds. Friedman and Meakin (2009) considered the GCC countries to be home to some of the largest and oldest sovereign wealth funds. They estimated that the assets of the GCC countries ranged almost between 600 billion and 1 trillion US dollars at the end of 2008.

In addition, the increase in oil revenues caused liquidity (money supply), as represented by broad money (M3), to increase in the GCC countries. An increase in broad money plays a role in determining the RER through inflationary pressures. Table 8 indicates that the average money supply in the GCC countries ranged from 30.01% of the GDP in Oman to 67.44% in Bahrain from 2000-2010. Moreover, the ratio of money supply to GDP followed almost the same trend in all the GCC countries. Therefore, liquidity is a major factor in determining the RER in the GCC countries through the effect of the inflation rate.

One of the main objectives in establishing the council of GCC countries was to establish a sense of integration and inter-connection between member states in all economic fields such as finance, trade, tourism and customs. Therefore, the council established a free trade

zone between member states in 1983, a customs union in 2003 and a common market in 2008. The council believed that these bodies will enhance more trade among the GCC countries (intra-trade) and ease the movement of labor and capital. Table 9 and 10 show that GCC intra-trade increased with time in terms of either exports or imports except in 2009 when the worldwide economic recession occurred. The value of exports and re-exports in the free trade zone among the GCC countries increased by 56.48% from 2006-2008 while the value of imports increased by 61.14% in the same period. Achieving the process of establishing a monetary union and a single GCC currency could assist in increasing intra-trade and enhancing the economic growth of the GCC countries. Ultimately, it will support the position of the GCC in terms of its regional and international economy.

In the 1980s, the GCC countries started to link their currencies to the US dollar. By 2003, all the GCC countries had pegged their currencies to the US dollar. However, in 2007, Kuwait decided to break this linkage and they re-pegged to a basket of currencies. There is considerable debate surrounding the strong linkage among most GCC currencies to the US dollar. Some economic analysts believe that the GCC countries should continue to peg their currencies to the dollar due to the size of the US economy and to the GCC countries' investment in US markets. On the other hand, some analysts believe that the GCC countries could benefit from free-floating

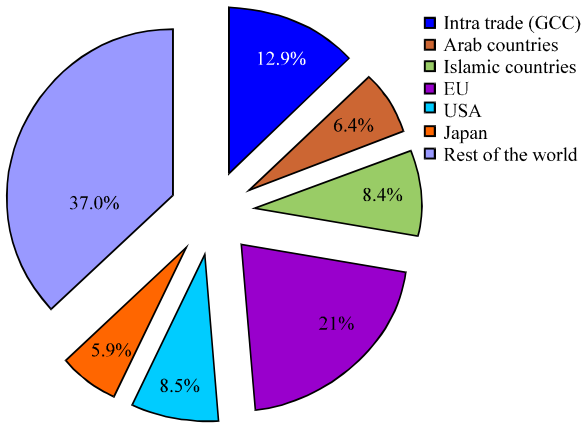


Fig. 5: Trade value of GCC countries in 2009: Source: GCC, 2011

currencies, especially in view of the weakness of the US dollar which has led to a reduction in the trade account of the GCC countries. Looking at the map of the trade direction of the GCC countries, it can be seen that the US accounted for only 8.5% of the trade values in the GCC countries in 2009 (Fig. 5). Figure 5 also illustrates that the EU accounted for 21% of the total trade values of the GCC. The rest of the world, the Islamic countries, the Arab countries and Japan accounted for 37, 8.4, 6.4 and 5.9% of the total trade values, respectively. The figure also shows that the trade values of intra-trade among the GCC countries was only around 13% which is considered to be relatively low and could be attributed to the similarity between the economic characteristics of the GCC economies.

In 1945, more than sixty years ago, the Arab countries tried to launch a united currency called “the Arab Dinar,” but this endeavor was never realized. Recently, six GCC Arab countries namely Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the UAE became very close to succeed in their efforts. The research problem indicates that it is imperative to identify the behavior of determinants of RER for each GCC country. This identification will, then, allow for the determination and in-depth study of the similarities and differences in relation to the impact of each factor involved in RER patterns.

The purpose of this study was to investigate the determinants of the RER as inspired by the previous study. As a first step, each relevant variable will be tested according to the standard Augmented Dickey-Fuller (ADF) unit root test in order to be able to apply. While in the second step, the Engle and Granger (1987) stated that two-step co-integration method analysis will determine the appropriateness of using the Vector Error Correction (VEC) or Vector Auto-Regression (VAR)

model for each GCC country. The equations were also tested for autocorrelation, heteroscedasticity and structural breaks.

MATERIALS AND METHODS

Data was collected from International Finance Statistics (IMF, 2012c), Penn World Table (IMF, 2012b) and World Development Indicators (World Bank, 2012) and Energy Information Administration (EIA), USA sources. Also, IMF (2012c) and SAMA (2011) sources were used to obtain financial statistics from international monetary fund, USA.

There are many econometric methods available to estimate the RER for each country. The most straightforward method is to use a two-step least squares procedure (Engle and Granger, 1987). First, the study used the method of least squares to estimate the co-integration relationship and to generate the lagged residuals. Secondly, the method of least squares was used to estimate the VEC and VAR models taking into consideration the facts that the variables in our system are co-integrated and the residuals must be stationary. In addition, it was kept in mind whether the variables under consideration are co-integrated and there is any long-term relationship between the trends in these variables. In this study, the techniques implemented by Engle and Granger (1987) and Johansen (1995) were followed. These econometric techniques allowed us to conduct an investigation of the determinants of RER on long and short term basis.

Econometric model: The econometric model used in the study is defined as follows:

$$RER = f(GCON, LIQ, OIL, OPEN, NKF, RES, RESN, CAGDP) \quad (1)$$

Where:

- RER = Real exchange rate
- GCON = Government consumption = General government consumption/GDP
- LIQ = Liquidity = M3/GDP
- OIL = Prices of oil
- OPEN = Degree of openness = (Imports+Exports)/GDP
- NKF = Net capital flows = Balance of goods and services [-(Exports-Imports)/GDP]-change in gross international reserves (including gold, in current US Dollars)/GDP
- RES = Total reserves (including gold)/GDP
- RESN = Reserves excluding gold/GDP
- CAGDP = Current account as a share of gross domestic product (CAGDP)

The regression in this study was estimated twice for each GCC country i.e., once for the long term and once for the short term using VEC and VAR models.

To gain an understanding of whether the variables under consideration are stationary or not, the researcher in this study plotted each series to find out whether each series represented non-stationary data.

The Dickey-Fuller (ADF) unit root test was based on the following three regression forms:

Without constant and without trend:

$$\Delta Y_t = \delta Y_{t-1} + U_t \tag{2}$$

With constant, but no trend:

$$\Delta Y_t = \alpha + \delta Y_{t-1} + U_t \tag{3}$$

With constant and with trend:

$$\Delta Y_t = \alpha + \beta T + \delta Y_{t-1} + U_t \tag{4}$$

The hypotheses tested were:

$$H_0: \delta = 0 \text{ (unit root)}, H_1: \delta < 0$$

Based on the econometrics information, it was decided that, as a rule, non-stationary variables should not be used in regression models to avoid the problem of spurious regression. However, there is an exception to this rule when the residuals of the regression are stationary. In this case, the variables are said to be co-integrated (sharing similar stochastic trends and never diverging too far from each other).

Based on the co-integration test, the researchers in this study used the VEC and VAR models (Johansen, 1995). The data was collected from 1982-2012 for the six GCC countries namely Saudi Arabia, United Arab Emirates, Kuwait, Qatar, Oman and Bahrain on the basis of nine variables are defined as follows:

- RER = Real exchange rate index = the ratio of the foreign (US) wholesale price index, multiplied by the Nominal Exchange Rate (NER) to the domestic consumer price index, 2000 = 100 for the index
- GCON = Government consumption = General government consumption/GDP
- LIQ = Liquidity = M3/GDP
- OIL = Prices of oil
- OPEN = Degree of openness = (Imports+Exports)/GDP
- NKF = Net capital flows = Balance of goods and services [-(Exports-Imports)/GDP]-change in gross international reserves (including gold, in current US Dollars)/GDP
- RES = Total reserves (including gold)/GDP
- RESN = Reserves excluding gold/GDP
- CAGDP = [(Exports-imports)/GDP]-current account as a share of gross domestic product (GDP)

RESULTS

Data in Table 11 indicates that all the economic variables were non-stationary series thereby concluding that it is not possible to reject the null hypothesis of the unit roots problem in variables except for the economic variables of LOGOPEN (Kuwait), LOGNKF (UAE) and LOGCAGDP in all of the GCC countries at 1% level of significance. That means that these variables are stationary series. These results seemed to reliable because the Durbin-Watson statistical tests were close to 2 which means that the variation in the series does not have an autocorrelation problem.

As a result, the researchers found that how to combine the stationary and non-stationary variables later on in a regression model. Co-integration is about the relationship between I(1) variables. The co-integrating equation does not contain I(0) variables. In other words, the stationary and non-stationary variables should not

Table 11: Summary of economics results unit roots tests results-augmented dickey-fullerr tests (ADF)

Economic variables	Bahrain	Kuwait	Oman	Qatar	Saudi Arabia	United arab emirates
LOGRER	-0.693 [0.964]	-2.523 [0.120]	-1.958 [0.599]	-1.867 [0.646]	-3.354 [0.076]	-3.308 [0.084]
LOGGCON	-3.483 [0.015]	-3.490 [0.015]	-1.729 [0.713]	-0.354 [0.902]	-1.226 [0.882]	-1.436 [0.829]
LOGLIQ	-2.486 [0.128]	-3.722 [0.020]	-2.546 [0.305]	-0.029 [0.948]	0.439 [0.998]	-1.370 [0.583]
LOGOIL	-0.895 [0.943]	-2.151 [0.227]	-1.173 [0.672]	0.047 [0.955]	-0.555 [0.974]	-0.900 [0.942]
LOGOPEN	-2.587 [0.106]	-5.091* [0.001]	-1.581 [0.479]	-0.707 [0.828]	-0.878 [0.945]	-2.658 [0.259]
LOGNKF	-2.655 [0.093]	-1.470 [0.534]	-1.745 [0.399]	-0.112 [0.939]	-2.319 [0.172]	-5.436* [0.001]
LOGRES	-4.01 [0.018]	-3.033 [0.140]	-3.371 [0.074]	0.603 [0.987]	-0.59 [0.858]	-1.650 [0.748]
LOGRESN	-1.335 [0.859]	-1.672 [0.434]	-3.056 [0.134]	-0.025 [0.993]	-1.244 [0.693]	-0.855 [0.947]
LOGCAGDP	-4.130* [0.003]	-5.417* [0.000]	-4.803* [0.0005]	-4.058* [0.003]	-4.099* [0.003]	-4.580* [0.001]

Lag length is based on SIC. *Reject the null hypothesis that time series has a stochastic trend or contain a unit root at 1% significance level, Number in brackets indicates the p-value

Table 12: Regression results: Independent variable = LOGRER

Economic variables	Bahrain	Kuwait	Oman	Qatar	Saudi Arabia	United Arab Emirates
C	0.822	1.011	-0.451	0.399	1.525	0.846
	2.014*	11.800*	-1.290*	0.593*	4.383*	1.282*
	0.055**	0.000**	0.209**	0.558**	0.000**	0.211**
LOGGCON	0.327	0.015	0.084	0.461	0.018	0.184
	2.624*	0.794*	0.548*	2.766*	0.156*	0.936*
	0.015**	0.434**	0.588**	0.010**	0.877**	0.357**
LOGLIQ	0.143	0.111	0.343	-0.410	0.410	-0.154
	1.499*	3.910*	1.977*	-2.762*	7.056*	-1.588*
	0.147**	0.000**	0.059**	0.010**	0.000**	0.124**
LOGOIL	0.044	-0.018	-0.238	-0.500	-0.122	-0.407
	0.308*	-0.803*	-1.656*	-3.038*	-1.151*	-7.019*
	0.761**	0.429**	0.110**	0.005**	0.261**	0.000**
LOGOPEN	-0.016		0.037	0.059	-0.213	0.149
	-0.107*		0.205*	0.176*	-1.768*	0.984*
	0.916**		0.838**	0.861**	0.090**	0.334**
LOGNKF	-0.199	-0.818	-0.139	0.141	-0.209	
	-3.376*	-4.020*	-1.543*	0.461*	-3.653*	
	0.003**	0.000**	0.135**	0.648**	0.001**	
LOGRES	0.113	-0.002	-0.013	0.089	0.081	0.163
	3.114*	-0.234*	-0.352*	0.853*	2.398*	1.713*
	0.005**	0.816**	0.727**	0.401**	0.025**	0.099**
LOGRESN	0.067	-0.054	0.346	0.243	-0.113	0.077
	0.450*	-2.995*	7.282*	1.521*	-3.676*	0.670
	0.657**	0.006**	0.000**	0.141**	0.001**	0.508
LOGCAGDP						
Adjusted R-squared	0.923	0.621	0.953	0.906	0.976	0.915
Durbin-Watson stat	2.140	2.135	1.467	2.069	1.528	0.606
F-Stat	54.114	9.500	91.345	43.896	187.803	56.861
[Prob(F-statistic)**	0.000**	0.00001**	0.000**	0.000**	0.000**	0.000**

*Indicates the T-statistics value and **Indicate the p-value

be mixed in a regression equation. An I(0)-dependent variable on the left-hand side of the regression equation should be explained by other I(0) variables on the right-hand side and an I(1)-dependent variable on the left-hand side of the regression equation should be explained by other I(1) variables on the right-hand side.

Based on the available econometrics information, it was concluded that as a general rule, the non-stationary variables should not be used in regression models in order to avoid the problem of spurious regression. However, there is an exception to this rule when the residuals of the regression are stationary. In this case, variables are said to be co-integrated (sharing similar stochastic trends and never diverting too far from each other). To check for co-integration, the fitted regression equations for all GCC countries were obtained where the dependent variables were LOGRER. The non-stationary variables were excluded from the regression equations. The results of the fitted regression equations are presented in Table 12. Based on the results in Table 12, a test was performed for stationarity among the residuals. The results of the estimated unit root test equations for the residuals are presented in Table 13. As a result, the potential co-integration relationship contains an intercept term to capture the component of the RER which is independent of the independent variables included in the regression equation. Thus, at a 5%

critical value for the test for stationarity, the null hypothesis of no co-integration was rejected and concluded that the variables in the system for the GCC countries are co-integrated. The results in Table 12 also imply that:

- Growth in the RER in Bahrain is significantly linked to the growth of the net capital flow, the growth of government consumption and the total reserves (including gold)/GDP
- Growth in the RER in Kuwait is likely linked to the growth of the net reserve, the net capital flow and liquidity
- Growth in the RER in Oman is significantly and positively linked to the growth of the total reserves series in Oman
- Growth in the RER in Qatar is significantly linked to the growth of the liquidity series in Qatar, the growth of the government consumption in Qatar and the growth of the oil series in Qatar
- Growth in the RER in Saudi Arabia is significantly linked to the growth of the net capital flow, liquid assets, the growth of the reserves excluding gold/GDP and the total Reserves (including gold)/GDP
- Growth in the RER in the UAE is significantly linked to the growth of the price of oil

Table 13: VEC model results

Country	Cointegration estimated unit root test equation for residual	Estimated VEC model results
Bahrain	$\Delta et = -1.075899 et-1$ -5.943* 0.000**	$\Delta LOGRER = 0.009254+0.018831 \Delta RESID01(-1)$ 0.426* 0.672**
Kuwait	$\Delta et = -1.075561 et-1$ -5.954* 0.000**	$\Delta LOGRER = 0.000902-0.212188 \Delta RESID01(-1)$ 1.134* 0.266**
Oman	$\Delta et = -0.755023 et-1$ -4.360* 0.000**	$\Delta LOGRER = 0.012777-0.240253 RESID01(-1)$ 1.186* 0.080**
Qatar	$\Delta et = -1.047300 et-1$ -5.723* 0.000**	$\Delta LOGRER = 0.014976-0.240808 RESID01(-1)$ 2.058* 0.048**
Saudi Arabia	$\Delta et = -0.767575 et-1$ -4.314* 0.000**	$\Delta LOGRER = 0.013652-0.0119929 \Delta RESID01(-1)$ 1.361* 0.183**
United Arab Emirates	$\Delta et = -0.366266 et-1$ -2.917* 0.006**	$\Delta LOGRER = 0.011040+0.266010 \Delta RESID01(-1)$ 1.966* 0.059**

*T-statistics value and **p-value

However, the growth in the RER in the GCC countries may not respond fully within the year. To ascertain how much it will respond within a year, the error correction model (VEC) was estimated using the method of least squares. The estimated VEC model is shown in Table 13 and the followings were observed.

The positive error correction coefficient in the equation indicates that $\Delta LOGRER$ in Bahrain increased when there was a positive co-integration error. This negative change in the growth of the RER in Bahrain “corrects” the co-integration error. It is well known that if the variables are not stationary but are co-integrated, then the VEC model should be used. However, the error correction coefficient for Bahrain ($R = 0.018831$) is not significant at the 5% level suggesting that the dependent variable, $\Delta LOGRER$, in Bahrain does not react to the co-integration error. In conclusion, the growth in the RER in Bahrain is significantly linked to the growth in the net capital flow, the growth of government consumption and the total reserves (including gold)/GDP:

- Since the error correction coefficients in the VEC model for Kuwait were non-significant, it is highly recommended that a different model with different variables (other than the ones used in this study) should be found. This implies that the theoretical model is inconsistent with the reality in Kuwait. Future research should test a different theoretical model or include more period (2006 and above, if the data become available) in their model. In conclusion, the RER in Kuwait is likely linked to the growth of the net reserve, the net capital flow and liquidity
- The VEC models showed that the error correction coefficients in Oman are insignificant suggesting that the growth in the RER of Oman does not react

to the co-integration error in the short term, a larger sample of data or additional variables are required. The growth in the RER in Oman is significant and positively linked to the growth of the total reserves series in Oman

- Negative change (-0.240808) in the error correction in the VEC equation in Qatar corrects the co-integrating error. The error correction of -0.240808 shows that an adjustment for the growth in the RER in Qatar will deviate by -0.240808 in the short term of the regression equation for the RER in Qatar which is significantly linked to the growth of the liquidity series, the growth of government consumption and the growth of the oil series in Qatar. Moreover, the error correction of -0.240808 is significant
- Negative error correction coefficient in the equation indicated that $\Delta LOGRER$ in Saudi Arabia falls when there is a positive co-integration error. This negative change in the growth of the RER in Saudi Arabia “corrects” the co-integrating error. It is well known that if the variables are not stationary, but rather co-integrated, then the VEC model should be used. However, the error correction coefficient for Saudi Arabia ($R = -0.0119929$) is not significant at the 5% level, suggesting that the dependent variable, $\Delta LOGRER$, in Saudi Arabia does not react to the co-integration error. In verifying, whether the other significant variables in the equation react to the co-integration error in Saudi Arabia within a year, it was found that none of them reacted to the co-integration error. The growth in the RER in Saudi Arabia is significantly linked to the growth of net capital flow, liquid assets, the growth of the reserves excluding gold/GDP and the total reserves (including gold)/GDP

- Positive error correction coefficient in the equation indicates that ΔLOGRER in the UAE increased when there was a positive co-integration error. This positive change in the growth of the RER in the UAE “corrects” the co-integrating error. The error correction coefficient ($R = 0.266010$) is not significant at the 5% level and suggests that ΔLOGRER in the UAE does not react to the co-integration error. It can be concluded that the VEC specification in the UAE did not restrict the long-term behavior of the endogenous variables in such a way as to converge upon their co-integrating relationships. Moreover, the growth in the RER in the UAE is determined by the growth in the oil price in the long run

DISCUSSION

The study results indicated that all the economic variables were non-stationary which did not allow to reject the null hypothesis of the unit roots problem in variables except for the economic variables of LOGOPEN (Kuwait), LOGNKF (UAE) and LOGCAGDP in all of the GCC countries at 1% level of significance. That means that these variables are stationary series. These results seemed to be reliable as the Durbin-Watson statistical tests were close to 2 which suggested that the variation in the series does not have an autocorrelation problem. Also, a change in RER is strongly linked to the growth of LOGGCON in Bahrain and Qatar; LOGLIQ in Kuwait, Qatar and Saudi Arabia; LOGOIL in Qatar and the UAE; LOGOPEN in Saudi Arabia alone; LOGNKF in Bahrain, Kuwait and Saudi Arabia; LOGRES in Bahrain, Saudi Arabia and the UAE and LOGRESN in Kuwait, Oman and Saudi Arabia. Similar findings were reported by many researchers who concluded that a change in RER is linked to various factors such as relationship between RER and NFA's (Benassy-Quere *et al.*, 2004) within a group of twenty from 1980-2002 using the panel co-integration method. They found that RER is likely to appreciate with decrease in the NFAs. Also, the financial development factor was introduced in the RER model in the Middle East and North Africa (MENA) region by Elbadawi and Kamar (2005). They observed a long-term relationship between RER and financial development. While, many researchers investigated the determinants of RER using different economic and financial factors such as the Gross Domestic Product (GDP), the degree of openness of the economy, oil prices, money supply, NFAs, reserves, public expenditures, real interest rates and the nominal exchange rates (Edwards, 1988, 1989; Froot and Rogoff, 1991; Faruqee, 1995; Agenor *et al.*, 1997; Parikh, 1997; Feyzioglu, 1997; Elbadawi and Soto, 1997; Sekkat and

Varoudakis, 1998; Ogun, 1998; Chen and Chen, 2007; Frankel, 2007; Habib and Kalamova, 2007; Mongardini and Rayner, 2009). Overall, the results of these studies varied based on the econometric techniques applied to investigate the determinants of RER in a changing economy of a country. The study findings coincided with those of Clark and MacDonald (1998) who built a model based on a reduced form of the equilibrium exchange rate equation and investigated the determinants of the equilibrium exchange rate using current account flow factors. Furthermore, Alberola (2003) illustrated that the RER in the European Union (EU) is affected by the current account and by NFAs. Egert *et al.* (2004) appreciated the RER due to higher capital inflows and higher NFAs.

CONCLUSION

The study indicated that all of the variables are non-stationary except for the economic variables of LOGOPEN (Kuwait), LOGNKF (UAE) and LOGCAGDP in all of the GCC countries at 1% level of significance. Therefore, these variables were excluded from the system when applying the econometric techniques, as these variable have zero order of integration $I(0)$. The results indicated that all the economic variables that have one order of integration $I(1)$ are co-integrated in the long run thus showing that a change in the RER is significantly linked to:

- Growth of LOGGCON in Bahrain and Qatar
- Growth of LOGLIQ in Kuwait, Qatar and Saudi Arabia
- Growth of LOGOIL in Qatar and the UAE
- Growth of LOGOPEN in Saudi Arabia alone
- Growth of LOGNKF in Bahrain, Kuwait and Saudi Arabia
- Growth of LOGRES in Bahrain, Saudi Arabia and the UAE
- Growth of LOGRESN in Kuwait, Oman and Saudi Arabia

From these results, it can be concluded that there are different economic variables that determine the RER in GCC countries, even though there are some common economic variables that are used to determine the RER in some GCC countries.

Another significant finding of the study was the indication of the negative and positive error correction coefficients. Negative error correction coefficients indicate that the dependent variable (RER) should adjust upward, since the RER falls below its long-term value. While the positive error correction coefficient indicates that the dependent variable (RER) should adjust

downward since the RER falls above its long-term value. Therefore, the results indicated that all the error correction coefficients are negative in all the GCC countries except Bahrain and Saudi Arabia having positive error correction coefficients. Finally, the results of the study indicated that the error correction coefficients of the RER among the GCC countries are not significant at the 5% level except the State of Qatar. This suggests that the dependent variable, ΔLOGRER , does not react to the co-integration error. However, in the case of Qatar, the error correction coefficient is significant and this implies that the adjustment for the growth in the RER in Qatar will deviate by -0.240808 in the short term. Namely, the RER in Qatar is going to reach long-term equilibrium within almost 4 years, according to the values of the error correction coefficient of the ΔLOGRER variable in Qatar.

ACKNOWLEDGMENT

The authors would like to thank Deanship of Scientific Research, King Faisal University, Saudi Arabia for financial support of this research through Research Project Number 130047.

REFERENCES

- Agenor, P.R., A.W. Hommaister and C.I. Medeiros, 1997. Cyclical fluctuations in Brazil's real exchange rate: The role of domestic and external factors. IMF Working Paper WP/97/128. <http://www.imf.org/external/pubs/ft/wp/wp97128.pdf>
- Alberola, E., 2003. Real convergence, external disequilibria and equilibrium exchange rates in EU acceding countries. Bank of Spain, Madrid, Spain.
- Alhajhoj, H., 2010. Determinants of inflation in the GCC countries: Cointegration approach. Khartoum Univ. J. Manage. Stud., 3: 34-42.
- Aron, J., I. Elbadawi and B. Kahn, 1997. Determinants of the real exchange rate in South Africa. WPS/97-16, Center for the Study of American Economies, Oxford.
- Benassy-Quere, A., P. Duran-Vigneron, A. Lahreche-Revil and V. Mignon, 2004. Burden sharing and exchange rate misalignment within the group of Twenty. Proceedings of the International Economics Workshop on Dollar Adjustment: How Far? Against What?, May 25, 2004, Washington, DC, USA.
- Bruno, M., 1976. The two-sector open economy and the real exchange rate. Am. Econ. Rev., 66: 566-577.
- Chen, S.S. and H.C. Chen, 2007. Oil prices and real exchange rates. Energy Econ., 29: 390-404.
- Clark, P.B. and R. MacDonald, 1998. Exchange rates and economic fundamentals: A methodological comparison of BEERs and FEERs. IMF Working Paper 98/67, International Monetary Fund, Washington, DC.
- Edwards, S., 1988. Real and monetary determinants of real exchange rate behavior: Theory and evidence from developing countries. J. Dev. Econ., 29: 311-341.
- Edwards, S., 1989. Real Exchange Rate, Devaluation and Adjustment. MIT Press, Cambridge, UK.
- Egert, B., A. Lahreche-Revil and K. Lommatzsch, 2004. The stock-flow approach to the real exchange rate of CEE transition economies. CEPII, Working Paper No. 2004-15, pp: 4-28.
- Elbadawi, I. and B. Kamar, 2005. The great debate on exchange rate regimes: Why should the Mena region care? Proceedings of the 12th Annual Conference on Economic Research Forum, December 19-21, 2005, Cairo, Egypt.
- Elbadawi, I.A. and R. Soto, 1997. Real exchange rates and macroeconomic adjustment in Sub-Saharan Africa and other developing countries. J. Afr. Econ., 6: 74-120.
- Engle, R.F. and C.W.J. Granger, 1987. Co-integration and error correction: Representation, estimation and testing. Econometrica, 55: 251-276.
- Faruqee, H., 1995. Long-run determinants of the real exchange rate: A stock-flow perspective. International Monetary Fund, Staff Papers No. 42, pp: 80-107.
- Feyzioglu, T., 1997. Estimating the equilibrium real exchange rate: An application to Finland. IMF Working Paper. No. WP/97/109, International Monetary Fund, Washington DC.
- Frankel, J.A., 2007. On the Rand: Determinants of the South African exchange rate. NBER Working Paper No. 13050, April 2007.
- Friedman, T. and S. Meakin, 2009. The 2009 preqin sovereign wealth fund review. Preqin, London. https://www.preqin.com/docs/samples/preqin_2009_sovereign_wealth_fund_sample_pages.pdf
- Froot, K. and K. Rogoff, 1991. Government consumption and the real exchange rate: The empirical evidence. Harvard Business School, Mimeo.
- GCC., 2011. Statistical Bulletin. Vol. 19, GCC, Saudi Arabia.
- Gavin, M., 1992. Monetary policy, exchange rates and investment in Keynesian economy. J. Int. Money Finance, 11: 145-161.
- Ghassan, H.B. and H.R. Alhajhoj, 2009. Test of private investment governmental spending competition impact in Saudi Arabia economy through Bootstrapping technique. Arab Econ. Bus. J., Vol. 4.

- Ghura, D. and T. Greenes, 1993. The real exchange rate and macroeconomic performance in Sub-Saharan Africa. *J. Dev. Econ.*, 42: 155-174.
- Habib, M.M. and M.M. Kalamova, 2007. Are there oil currencies? The real exchange rate of oil exporting countries. Working Paper Series No 839, European Central Bank.
- IEA., 2012. World energy outlook 2012. International Energy Agency, USA.
- IMF., 2012a. International Financial Statistics Yearbook, 2012. International Monetary Fund, USA.
- IMF., 2012b. World Economic Outlook. International Monetary Fund, USA.
- IMF., 2012c. Global World Finance (WGF). International Monetary Fund, Cambridge University Press, New York, USA.
- Johansen, S., 1995. Likelihood-based Inference in Cointegrated Vector Autoregressive Models. Oxford University Press, New York, ISBN: 9780198774501, Pages: 267.
- Khan, M., 2008. The GCC monetary union: Choice of exchange rate regime. The Middle East and Central Asia Department, International Monetary Fund (IMF), USA.
- Mongardini, J. and B. Rayner, 2009. Grants, remittances and the equilibrium real exchange rate in sub-Saharan African countries. IMF Working Paper No. 09/75, International Monetary Fund (IMF), Washington, DC., USA.
- Obstfeld, M., 1984. Balance-of-payments crises and devaluation. *J. Money Credit Banking*, 16: 208-217.
- Ogun, O., 1998. Real exchange rate movements and export growth: Nigeria, 1961-1990. AERC Research Paper No. 82, African Economic Research Consortium (AERC), Nairobi, Kenya.
- Parikh, A., 1997. Determinants of real exchange rates in South Africa: A short-run and long-run analysis. *Afr. J. Econ. Policy*, 4: 1-27.
- SAMA., 2011. Annual report 2011. SAMA Report No. 47, Saudi Arabian Monetary Agency (SAMA), Saudi Arabia.
- Sekkat, K. and A. Varoudakis, 1998. Exchange-rate management and manufactured exports in Sub-Saharan Africa. OECD Development Center Technical Paper No. 134, OECD, Paris. <http://78.41.128.130/dataoecd/19/16/1922533.pdf>.
- Sturm, M., J. Strasky, P. Adolf and D. Peschel, 2008. The gulf cooperation council countries: Economic structures, recent developments and role in the global economy. European Central Bank Occasional Paper No. 92, July 2008. <http://www.ecb.europa.eu/pub/pdf/scpops/ecbocp92.pdf>.
- Voss, G.M., 2002. Public and private investment in the United States and Canada. *Econ. Model.*, 19: 641-664.
- World Bank, 2012. World development indicators. Global Development Finance (GDF), World Bank, USA.