

**Deviation of Exchange Rate and Trade Balance:  
Evidence from the Member Countries of Gulf Cooperation council (GCC)**

**Lencongan Kadar Pertukaran dan Imbangan Dagangan:  
Bukti Dari Negara Majlis Kerjasama Negara-Negara Gulf**

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Article received on 16 January 2012; Article published online on 15 January 2013.

**Abstract**

Deviation or misalignment of the exchange rate has a different unwanted implication towards the economic growth. The right choice of exchange rate regime will bring an economy back to the equilibrium and many economists claim that it is one of the factors for the positive economic development. In contrast, a long term misalignment or deviation of the real exchange rate from the nominal rate can lead to severe macroeconomic imbalances, lead to speculation attack and against the orthodoxy of macroeconomic parities. However the empirical findings of previous studies with regards to the relationship of exchange rate and trade balance are not conclusive and are inconsistent for different countries. Although theoretically, the strengthening of a currency is expected to contribute towards the improvement of trade balance, there are other factors influencing the environment that might produce different outcome. The main objective of this paper is to analyse the long run relationship between deviation of exchange rate and trade balance in the Gulf Cooperation Council (GCC) member countries. The GCC is one of the important world markets. The economy of the GCC has developed tremendously in which the average gross domestic production (GDP) for the period of 1980 – 2008 is more than 300 percentages and Malaysia has a special interest in the region. Using the Purchasing Power Parity (PPP) model, we empirically identify that the currency of Saudi Arabia, Kuwait and Qatar at most of the time are overvalued while Bahrain and Oman are on the opposite. The study also shows that all GCC member countries are enjoying positive trade balance. Utilising two-step Engel-Granger cointegration technique we find a significant long run relationship between the exchange rate

deviation and trade balance for most of the member countries in the long run but not in the short-run.

***Keywords: Real Exchange Rate, Nominal Exchange Rate, Trade Balance, Value of Currency.***

### **Abstrak**

Lencongan atau pesongan kadar pertukaran akan mengakibatkan kesan yang tidak dingini kepada ekonomi negara. Pemilihan rejim kadar pertukaran yang tepat akan mengembalikan semula pesongan kadar pertukaran kepada titik keseimbangan dan seperti yang didakwa oleh ramai ahli ekonomi fenomena ini adalah salah satu faktor kepada pertumbuhan ekonomi yang positif. Sebaliknya, pesongan kadar pertukaran benar dan kadar pertukaran nominal yang berpanjangan akan menyebabkan ketidakseimbangan makroekonomi, memudahkan serangan mata wang dan bertentangan dengan aliran perdana pariti makroekonomi. Walaupun secara teorinya pengukuhan mata wang boleh merubah keseimbangan perdagangan, namun banyak kajian yang tidak mendapat keputusan seperti yang dingini. Tujuan utama kajian ini ialah untuk menganalisis hubungan jangka panjang antara pesongan kadar pertukaran dan imbangan perdagangan bagi negara anggota Majlis Kerjasama Negara Teluk (GCC). Negara Majlis Kerjasama Negara Teluk merupakan salah satu kawasan yang terpenting di dalam peta perdagangan antarabangsa. Ekonomi GCC diukur menggunakan Keluaran Dalam Negara Kasar (KDNK) telah bertumbuh lebih daripada 300 peratus dalam tempoh 1980 hingga 2008 dan Malaysia mempunyai kepentingan yang unik di kawasan ini. Menggunakan teori model Pariti Kuasa Beli (PPP), kami secara empirik menunjukkan bahawa mata wang Arab Saudi, Kuwait dan Qatar pada kebanyakan masa adalah berada pada keadaan terlebih nilai manakala sebaliknya berlaku kepada matawang Bahrain dan Oman. Kajian juga menunjukkan negara Majlis Kerjasama Negara Teluk mengalami imbangan perdagangan yang positif sepanjang tempoh kajian. Menggunakan ujian kointegrasi 2-prosedur Engel-Granger, kajian mendapati wujud hubungan jangka panjang antara pesongan kadar pertukaran dan imbangan perdagangan bagi kebanyakan Negara Majlis Kerjasama Teluk. Namun hubungan ini tidak wujud dalam jangka pendek.

***Kata kunci: Kadar Pertukaran Benar, Kadar Pertukaran Nominal, Imbangan Perdagangan, Nilai Kadar Pertukaran***

## 1. Introduction

Without transportation costs, tariffs and other trade barriers, prices for identical goods, in an open economy or free trade, will be equalised. In other words, the free market will automatically enforces the “law of one price”, or also known as the doctrine of purchasing power parity (PPP).

The nominal exchange rate can also be considered as PPP, whereby the price differences between two countries will be adjusted to reach the equilibrium. The real exchange rate is the exchange rate that takes into account other costs such as inflation, transportation and transaction costs. According to theory, if PPP is in place, the real exchange rate will be constant. Therefore, any changes in the real exchange rate will indicate the deviation from its equilibrium i.e PPP or deviation from the nominal exchange rate.

Studies on the exchange rates have received many attentions, especially after the Bretton-Woods era whereby the foreign exchange rates are exposed to uncertainty. In summary, the chronological of the world exchange rate regime since 1880s are shown in Table 1.

Table 1: The Chronological of Exchange Rate Regime, 1880-2000

<b>Year</b>	<b>Regime</b>
1880-1914	Specie: Gold Standard; Currency Union; Currency Boards; Floats.
1919-1945	Gold Exchange Standard; Pure Floats and Managed Floats.
1946-1971	Bretton Woods Adjustable Pegs; Floats; Dwi/Multiple Exchange Rates.
1973-2000	Free and Managed Floats; Adjustable, Crawling and Basket Pegs; Target Zones or Bands; Fixed Exchange Rates; Currency Union; Currency Boards.

Source:Ishfaq (2010).

The choice of a country’s exchange rate system depends on the country’s objectives and policies. It is also influenced by the economic condition of a particular country. For the oil producers in the Arab Gulf, one of the major financial characteristics shared among the countries are the practice of fixed exchange rate. The Gulf Cooperation Council (GCC) for example, has pegged their currencies to the American Dollar (USD) for nearly three decades.

GCC is one of the important world markets. The economy of the GCC has developed tremendously in which the average gross domestic production (GDP) for the period of 1980 – 2008 is more than 300 percentage (Sarmidi, Ahmad, Yusuff dan Mustafa Kamil Azmie, 2010), with a population of 38 million. In 2009, the GDP reached USD863.64 billion. The GCC total trade in 2008 amounting to USD1,013.3 million, an increase of 35.5 per cent as compared to the

previous year. In 2009, the total trade recorded was USD773,631.1 million, representing 0.02 per cent of the world trade. Exports of the GCC in 2008 totaled USD653,074.2 million, a growth of 36.9 per cent compared to USD476,995.8 million in 2007. Exports in 2007 were USD473,247.2 million, or 0.03 per cent of the world trade. Imports in 2008 increased by 33.1 per cent to USD360,243.7 million, representing 0.02 per cent of the world imports. The GCC trade balance was USD172,863.3 million (2009), USD292,830.5 million (2008) and USD206,339.8 million (2007).

The objective of this paper is to analyse the deviation of the exchange rate in the GCC member countries, whether the currencies are being overvalued or undervalued. Then, this paper will have a look at the long run relationship of the exchange rate deviation and trade balance in the GCC.

The remainder of the paper organizes as follows. Next section, we briefly discuss the background and the importance of GCC, literature reviews, the dataset and the econometric procedures. Finally, the results and then concludes.

## **2. Background of the Gulf Cooperation Council**

The Gulf Cooperation Council (GCC) consists of six member states that are Bahrain, Kuwait, Oman, Qatar, United Arab Emirate (UAE) and Saudi Arabia. The GCC was established on 4 February 1981 as a regional cooperation in the area of politics, economics and social.

Out of the six GCC members, five states practices fixed exchange rate regime that is pegged to the US dollar: Bahrain, Oman, Qatar, Saudi Arabia and the UAE. The Dinar Kuwait is pegged to a basket of a few selected currencies. One of the reasons these oil producing countries' currencies are linked to the US currency is because the international oil price is quoted in the USD. The pegged will indirectly protect those countries from the exchange rate risk and hence, may guarantee a stable exports income (Olga and Marco, 2010). The background of each member states and the history of exchange rate practices are explained below.

### *Saudi Arabia*

With Riyadh as the capital and a land area of about two million kilometer square, Saudi Arabia is the largest country in the Arab Peninsular. The population census in 2009 was 25.37 million people, the crowded among the six members. The GDP of Saudi Arabia in 2009 was USD375.8 million, a growth of 0.6% as compared to the year before. GDP per capita was USD14,809, the fifth largest among GCC. In 2009, total trade amounting to USD287.9 billion, with exports USD192.3 billion, imports USD95.6 billion and the trade balance USD96.7 billion. Saudi's inflation rate was the lowest among other GCC members, which is 5.1 per cent, for 2010 (Jan-

Nov). The unemployment rate was 10.5 per cent. With a value of USD410.1 billion (as at 31 January 2011), Saudi's foreign reserve is the largest among GCC members.

Since the middle of 1970s, Saudi Arabia's financial system has experienced structural changes as a result of innovation in the banking and financial sector. Initially, the Saudi Arabia Monetary Agency (SAMA) had the currency fixed to the riyal. The implementation of this fixed exchange rate regime was to ensure a stable economic condition, price level and international trade. The situation became difficult in stabilising the riyal against the USD after the crisis of the Bretton Woods system. Thus, SAMA changed the country's policy and fixed the currency against the *International Monetary Fund's Special Drawing Rights* (SDR) unit in 1975. On July 22, 1981, SAMA had the riyal fixed to the USD.

### *Bahrain*

Bahrain is a small oil producing country, with a land area of 665 kilometer square, yet, a high GDP per capita of USD17,563 (2009). The capital is Manama. The population in 2009 totaled 1.11 million. The GDP in 2009 increased by 3.1 per cent to USD19.3 billion. Total trade for the same year was USD19.2 billion, with exports of USD11.9 billion and imports USD7.3 billion. The trade balance was USD4.6 billion. In 2009, the inflation rate was 2.8 per cent and the unemployment rate was 3.5 per cent. As at 2009, the foreign reserve stood at USD3.5 billion.

The Bahrain dinar was introduced in 1965 to replace the Gulf rupee. In the same year, Bahrain Board of Currency (BBC) also introduced paper currency. Starting 1973, Bahrain Monetary Agency (BMA) took over BBC's role. BMA later changed its name to the Central Bank of Bahrain in 2006. On December 1980, dinar was pegged to the SDRs and later to the USD. In practice, it was fixed at a rate of 1USD = BD0.376 or 1BD = USD2.65957.

### *United Arab Emirates (UAE)*

Abu Dhabi is the capital of UAE. The land area is 83,600 km square. The country has a population of 4.76 million people in 2009. The GDP in 2009 was valued at USD249 billion, an increase of 3.1 per cent from 2008, and was the second largest among the GCC, after Saudi Arabia (USD375.8 billion). The GDP per capita was USD34,334. UAE has the highest trade value among the GCC states, totaling USD315 billion (2009). Exports in the same year was valued at USD175 billion, imports USD140 billion, and trade balance was USD35 billion. Inflation in the UAE was within a range of six to eight per cent. The unemployment rate was 12.7 per cent (2008). The foreign reserve was USD39.6 billion in 2009.

The strengthening of the American Dollar in the middle of 2008 has also strengthened UAE's fix-peg exchange rate policy. The situation had also indirectly contributed towards the lowering of the country's inflation rate. UAE has also managed to diversify its economy, thus reducing the country's dependency on oil.

### *Kuwait*

The capital city of Kuwait is Kuwait City. The country has a land area of 17,818 km square with a population of 2.58 million people in 2009. GDP in the same year was valued at USD109.5 billion, a growth of two per cent from 2008. The GDP per capita was USD42,385. In 2009, the total trade amounting to USD68.2 billion and trade balance totaling USD32.4 billion. Exports was USD50.3 billion and imports USD17.9 billion. Inflation was 11.7 per cent while the unemployment rate was 2.2 per cent. The foreign reserve stood at USD10.6 billion.

The Kuwait Currency Law and Kuwait Currency Board (KCB), were established in 1960. The Kuwait Dinar (KD), equal to one pound sterling was introduced a year after, that was in 1961, to replace the Gulf rupee. When Kuwait was invaded by Iraq in 1990, the Iraqi Dinar Iraq then replaced KD. However, after the Gulf War ended, KD was reused.

In Jun 1968, the Central Bank of Kuwait was established to replace KCB. From Mar 1975 until January 2003, the KD was pegged to a basket of a few currencies. Then, it was later pegged to the USD at a rate of  $USD1=0.2996KD$ , with a margin around 3.5 per cent, or  $1KD = 3.3374USD$ . Since Jun 2007, Kuwait abandoned the USD pegged and returned to the previous practice of pegging the KD to a basket of currencies. The decision was made as an effort to overcome the increasing inflation as a consequence of continuous depreciation of the USD.

### *Oman*

Oman has a land area of 309,500 km square, with Muscat as the capital city. The population census in 2009 was 3.17 million people. In 2009, the GDP was USD46.1 billion, a growth of two per cent from 2008, and the GDP per capita was USD14,529. Oman's total trade in 2009 amounting to USD45.6 billion, with exports valued at USD27.6 billion and imports USD18 billion. Thus, the trade balance was USD9.6 billion (2009).

Before 1940, there were two currencies used, the Indian rupee and the Maria Theresa Thaler (also known as rial). In 1946, ceiling was introduced. Since 1959, the Indian rupee and the gulf rupee were continuously used. In 1970, a paper currency, the Saudi Rial, equal to the British pound, was introduced as Oman's new currency to replace the Gulf rupee. The name of the currency, Saidi Rial was later changed to Omani Riyal (OR) in 1970 because of changes in the country's governmentship. From 1973 - 1977, Oman Currency Board took over the role of Muscat and Oman Sultanate, in issuing the paper currency. In 1977, the Central Bank of Oman was assigned to issue OR. From 1973 until 1986, the OR was pegged to the USD, at a rate of  $1OR = USD2.895$ . In 1986, the rate was amended to  $1rial = USD2.6$ .

### *Qatar*

The capital city of Qatar is Doha. The country has a land area of 11,586 km square, and a population of 1.61 million in 2009. The GDP in 2009 increased by 11.8 per cent to USD98.3 billion, and the GDP per capita was USD61,106, that is the highest among the GCC and among the highest in the world. Total trade was valued at USD63.5 billion, with exports USD40.5 billion, imports USD23 billion and trade balance USD17.5 billion. The inflation rate in 2009 was 15.2 per cent while unemployment rate was 0.6 per cent. The country's foreign reserve was USD16.8 billion.

Up to the 1950's, just like the other gulf countries, the Indian rupee was used as Qatar's currency. In 1959, the gulf rupee was introduced and was used until 1966. On September 1966, Qatar and Dubai Currency Board introduced paper currency. In 1973, the modern Qatari Riyal (QR) was introduced by the Qatar Monetary Agency (AMQ). On March 1975, QR was officially pegged to the USD, 1USD = 3.64QR or QR1 = USD27.4. On Jun 1980, Qatar Central Bank was established and took over AMQ's role.

### **3. Literature Review**

Based on some previous literatures, deviation or misalignment of the exchange rate, whether overvalued or undervalued, has a different implication towards the economic growth. In fact, misalignment of the exchange rate is associated with uneven development among countries in the world. For instance, a very obvious misalignment in Africa and Latin America were reported to be the cause for the slow growth in those regions. On the contrary, the right choice of exchange rate which brings it back to the equilibrium is one of the factors for the positive economic development in Asia (Yotopoulos and Sawada, 2005).

A long term misalignment or deviation of the real exchange rate from the nominal rate can lead to severe macroeconomic imbalance. The study by Iannizzotto (2010) for the European countries reveals that a continuous fixed exchange rate causes huge misalignment of the exchange rate, and in some worse condition, can lead to speculation attack, against the parity identified. In addition, other measures will be required to bring it back to the equilibrium, such as through reassessment of the exchange rate (devaluation) and management of the demand policy (Qayyum, Khan and Zaman, 2007).

In other studies by Shatz and Tarr (2009), it is found that countries that practice fixed exchange rate had contributed towards the overvaluation of the real effective exchange rate (REER). Razin and Catia (2007) undertook the same study for some developed and developing countries and the findings showed that overvaluation has negative impact on the economic growth. Another study by Rincon (1998), for Colombia indicated that exchange rate does has a role in determining the trade balance for the country, both in the short run as well as in the long run. It is found that devaluation will lead to increased trade balance.

Research on the misalignment of exchange rate in the GCC is few. Among the studies undertaken reveals that for the period of five years (2001 – 2006), four of the GCC members (Bahrain, Oman, UAE and Saudi Arabia) had the currency undervalued within the range of (-18.4) to (-25.4) (Setsr 2007). Ibrahim and Majd (2001) in their studies found that Bahrain had implemented real depreciation policy of about 31 per cent, from 1992 up to 2005, with the aim to overcome serious overvaluation due to its practice of the fixed exchange rate regime.

There have been few studies to inspect the relationship between misalignment of the exchange rate and trade balance. The findings of the studies are inconclusive.

Based on a research by Murphy (2010) for the United States and fifteen of her trading partners, it is found that there is no significant relationship between the two variables. Onafowora (2003) in his study for the three ASEAN countries (Malaysia, Indonesia and Thailand) and two of their trading partners (the United States and Japan) reported that there is a positive long term relationship for all the cases tested.

Aziz (2008) studied the role of exchange rate in Bangladesh's trade balance. It was suggested that the REER does influence, in a positive manner, the trade balance of the country, for both long and short term period. The empirical research by Rose (1991) for five major members of the Organisation for Economic Cooperation and Development (OECD) that were the United States, German, Japan, Canada and the United Kingdom) concluded that exchange rate is not significant as a determinant of trade balance. Singh (2002) found that there is a very significant impact of exchange rate on trade balance of India. Similarly, the study by Vergil (2002) reveals that real exchange rate does significantly influenced Turki's exports to the United States. In the same study for France, Italy and German, the findings showed that the effect of exchange rate on trade balance of the countries is minimal.

Liew, Lim and Hussain (2003) investigated the impact of exchange rate on trade balance of five ASEAN countries (Indonesia, Philippines, Malaysia, Singapore and Thailand) with Japan. He discovered that the trade balance for all the countries are influenced by real money, than nominal exchange rate. For Malaysia, the study by Ng, Har and Tan (2008) observed that in the long run, there is significant relationship between exchange rate and trade balance, in which devaluation is associated with an improvement in trade balance.

For GCC, studies on the relationship between exchange rate and trade balance are very limited. A research by Olga (2010) discovered that for the last decades, as a result of depreciation of the nominal exchange rate in GCC, which was in line with depreciation of the American dollar, REER in the GCC did not indicate any consistent nor similar pattern. For example, depreciation of the local REER has led to a worsening of the trade balance for Saudi, Oman and Bahrain whilst UAE, Qatar and Kuwait experienced the strengthening of trade.



In conclusion, the findings of previous studies with regards to the relationship of exchange rate and trade balance are not conclusive and are inconsistent for different countries. Although theoretically, the strengthening of a currency is expected to contribute towards the improvement of trade balance, there are other factors influencing the environment that might produce different outcome.

Since the study on the influence of exchange rate on trade balance in GCC is still lacking, it is hope that this paper can be useful in determining how much the variables are related.

#### 4. Theoretical Framework

In literature, there are a few exchange rate models including financial model, Mundell-Fleming with a fixed and flexible price approach, and Dornbush model with a sticky price approach (Copeland 2008). However in this study we utilise the purchasing power parity (PPP) is also one of the determinants of an exchange rate. The PPP explains the relationship between domestic and foreign price with an equation:  $P = SP^*$ . This equation can be shown in a log form, with small letters representing the log sign:  $p = s + p^*$ . Hence, the nominal exchange rate, in a log form, can be represented as:

$$s = p + p^* \quad [1]$$

in which:

$s$ : nominal exchange rate

$p$ : domestic price level

$p^*$ : foreign price level

Deviation of an exchange rate happens when the real exchange rate deviates from the nominal exchange rate, or the equilibrium. This deviation, or also known as misalignment of the exchange rate, is said to influence the economic growth of a country. In general, an overvalued currency is stated to be deterrence to economic growth while an undervalued currency is believes to offer a conducive environment for economic development (Aguirre and Calderon, 2005). A stable exchange rate, on the other hand, can ensure stable development and economic growth. In addition, a stable exchange rate is very important for developing countries as it affects foreign direct investment flow into the countries, especially through international trade. Since there is element of certainty in a stable exchange rate regime, investors are able to expect the returns of their investments made.

The balance of payment theory expects that a little currency devaluation will result in increased balance of trade. This approach is known as the elasticity approach, that is a substitution effect whereby when the domestic price becomes more expensive, domestic production and consumption will be reduced (therefore, less import). Meanwhile, foreign

countries will be more interested to purchase domestic goods and services as they become cheaper abroad (thus exports increase). This situation will lead to an improve trade balance.

## 5. Data and Methodology

Main data are obtained from the World Development Bank and International Financial Statistics, for the period of 30 years (1980 to 2009). However, due to limitation of the data, the analysis for Oman is only for 1990 – 2009 while Qatar for 1994 – 2007. All of the currency value has been converted to the USD, based on the current year exchange rate. The value of trade balance is also quoted in the USD.

### Model Specification

Real exchange rate is the fixed exchange rate practiced by all the GCC countries. Nominal exchange rate is the equilibrium or can also be considered as PPP, as indicated by equation [1].

The assumption made is that there is a relationship between trade balance (Y) and deviation of the exchange rate (X), in a functional form of:  $Y = f(X)$  or as follow;

$$Y = \beta_0 + \beta_1 X + \mu \quad [2]$$

The two-step Engle-Granger co integration test involves the long run estimation of the exchange rate equation through standard regression. In order to proceed to the co integration test, the residual is first tested for stationary, using the ADF test. If the result shows that the residual is stationary at level, it is concluded that in the long run, the variables are co integrated. However, if the residuals are not stationary at level, it means that there is no significant relationship between deviation of the exchange rate and trade balance and the estimated coefficients in the OLS technique are spurious.

Since the data are time series, the unit root test with the Augmented Dickey-Fuller (ADF) method is used to test the stationary of the residual from the OLS estimation. The standard regression test can only be meaningful once the residual is found to be stationary at level.

Two variables are said to be co integrated if, individually, each of the variable is stationary. However, there might exist a linear combination for the non-stationary variables. This means that the economic time series which are not stationary may produce a stationary relationship if the variables are co integrated. For this, the unit root test for residual from the standard regression is conducted. If the residuals are stationary at level, then there might be integration between the variables.

According to the Granger Representation Theorem, if the variables, in the long run are co integrated, there will be an error correction model (ECM). This ECM can be used to analyse the short run relationship and to differentiate the long run relationship for all the variables. The procedure of the implementation involves first differentiation of the independent variables and lag value of the first differentiation of all other variables, including lag of the residual. The parameter of the ECM equation is estimated through OLS.

## 6. Results and Analysis

### *The Trend of Trade Balance and Deviation of the Exchange Rate*

In general, the trades balances for all the GCC countries, are on the increasing trend and were, most of the time, positive. Only Bahrain and Kuwait had experienced negative trade balance that was in the year 1992, due to the Gulf War. Besides, all the GCC members were not excluded from being hit by the global economic crisis in 1997 the American financial crisis in 2008. During that period, all the GCC trade balance deteriorated, as shown in Figure 1.

During this study period, the currency of Saudi Arabia, Kuwait and Qatar were overvalued while Bahrain and Oman were undervalued. The gaps or differences between the real exchange rate and the nominal exchange rate for the GCC are illustrated in Figure 2.

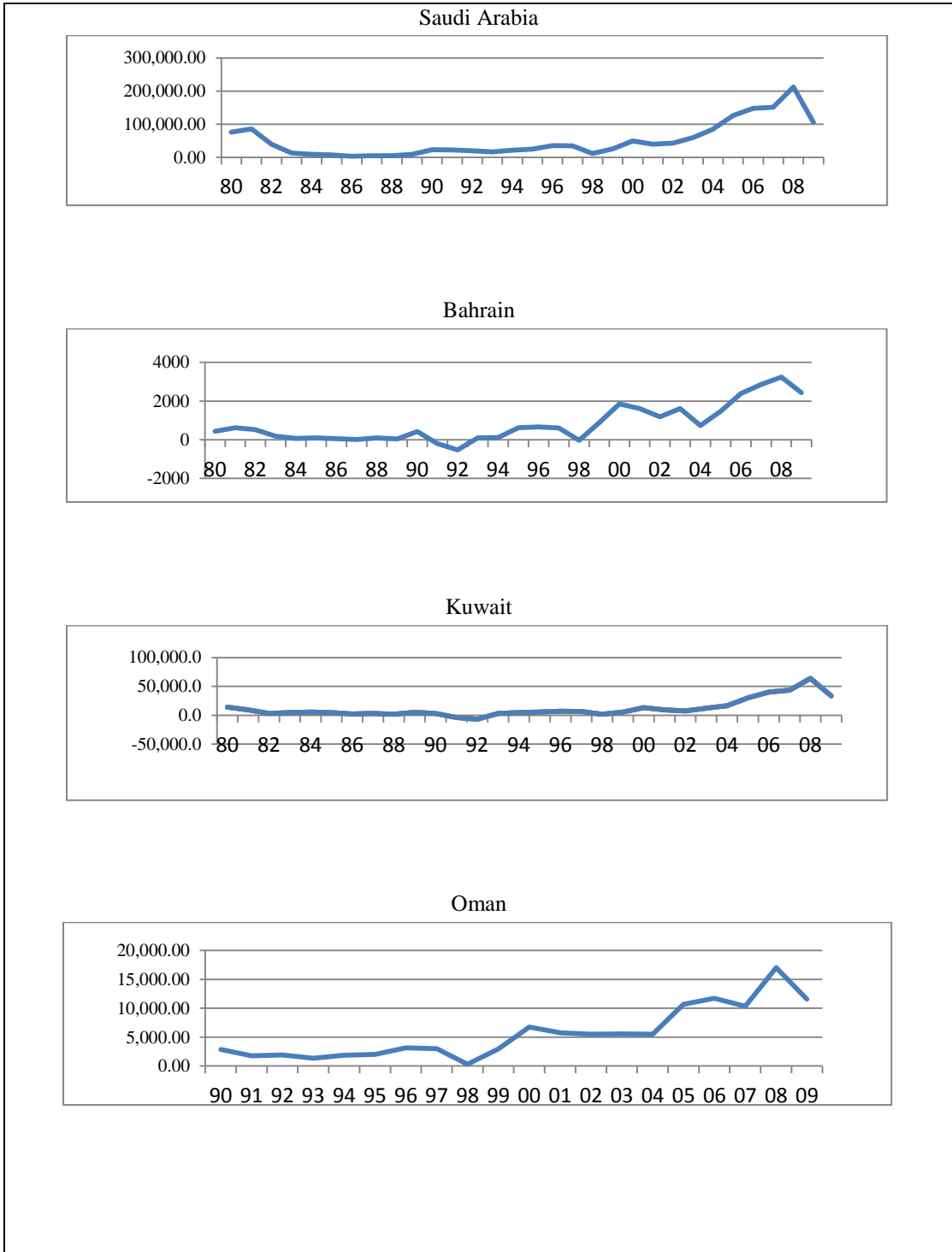
### *Cointegration Results*

Based on the OLS result, the value of t-statistics obtained for Saudi Arabia is 3.107 (with the probability of 0.0043), Bahrain 4.584 (probability 0.0001), Kuwait 3.363 (probability 0.0022), Oman 3.625 (probability 0.0019) and Qatar -3.452 (probability 0.0048). All of these t-values are bigger than the critical values at the significant level of 1% and 5%. Thus, it can be concluded that there is significant relationship between the variables tested i.e deviation of the exchange rate and trade balance, as indicated in Table 2.

Table 2 : The Summary Result of OLS Test

Country	$R^2$	<i>F Statistics</i>	<i>t statistics</i>	<i>p-value</i>
Arab Saudi	0.256	9.656	3.107	0.0043
Bahrain	0.429	21.010	4.584	0.0001
Kuwait	0.288	11.312	3.363	0.0022
Oman	0.422	13.144	3.625	0.0019
Qatar	0.498	11.919	-3.452	0.0048

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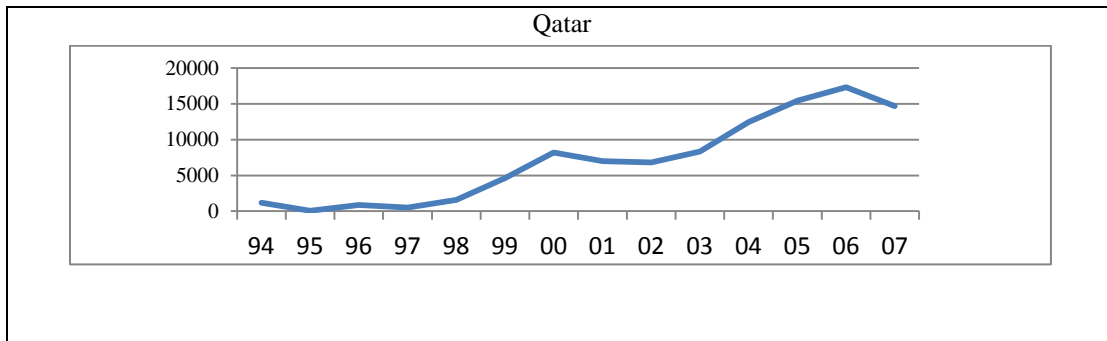
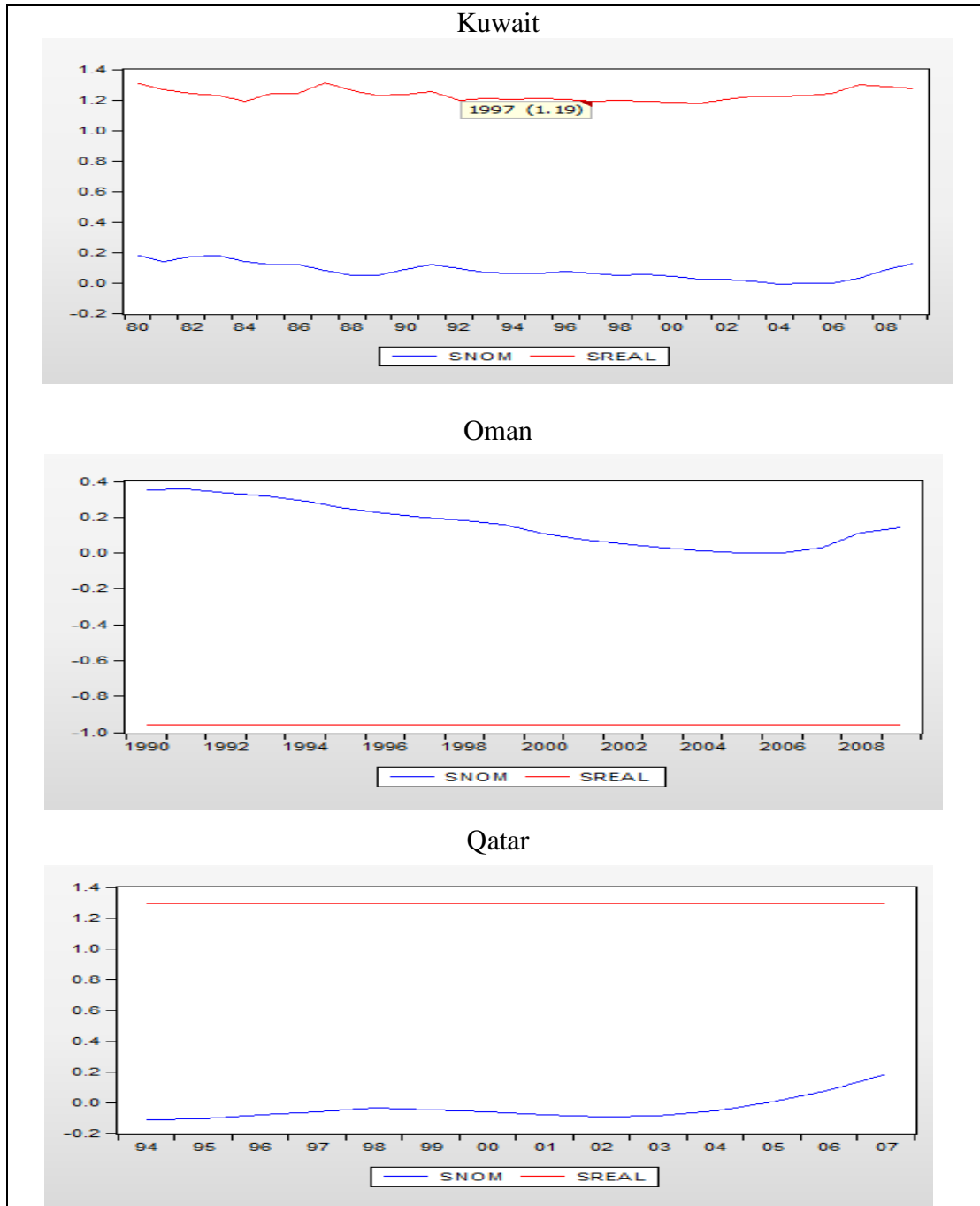


Figure 1: Trend of the Trade Balance for Saudi Arabia, Bahrain, Kuwait, Oman and Qatar from 1980 to 2009.



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*Note: SNOM is nominal exchange rate and SREAL is real exchange rate*

Figure 2: Nominal exchange rate and real exchange rate for Saudi Arabia, Bahrain, Kuwait, Oman and Qatar from 1980 to 2009

A stationary test is conducted on the residual. It is found that all residuals are stationary at level, with the value of -2.136 (Saudi Arabia), -1.816 (Bahrain), -1.673 (Kuwait), -1.654 (Oman) and -2.481 (Qatar), as in Table 3. This means that there is significant relationship between trade balance and misalignment of the exchange rate, for all the selected GCC countries.

Table 3 : Augmentd Dickey-Fuller Test of the Residual

	Arab Saudi	Bahrain	Kuwait	Oman	Qatar
Stationary Test	-2.136**	-1.816*	-1.673*	-1.654*	-2.481**

\*\*\*significant at 1%; \*\*significant at 5%; \*significant at 10%

The EGC test with univariate ECM method is to test the direction of the relationship between the two variables in the short run. Based on the result obtained as in Table 4, it is found that all the statistics values or the  $p$ -values for trade balance and deviation of the exchange rate are bigger than the critical values. Therefore, in the short run, we unable to reject the hypothesis of no Granger causality in the trade balance and the deviation of the exchange rate and vice versa.

Table 4: The Summary Result of Granger Causality Test

Country	Variable	Unit Root Test for the Residual	TB (p value)	Dev (p value)
Arab Saudi	TB	0.0387	-	0.6166
	Dev	0.0881	0.6992	-
Bahrain	TB	0.0309	-	0.7059
	Dev	0.3218	0.4047	-
Kuwait	TB	0.1640	-	0.3489
	Dev	0.7215	0.9214	-
Oman	TB	0.0572	-	0.2467
	Dev	0.3525	0.1409	-
Qatar	TB	0.5469	-	0.4574
	Dev	0.0636	0.5618	-

Note:TB is trade balance and Dev is deviation of the exchange rate

## 7. Summary

This paper has analysed the long run relationship between deviation of exchange rate and trade balance in the Gulf Cooperation Council (GCC) member countries. Employing the Purchasing Power Parity (PPP) model, we able to identify that the currency of Saudi Arabia, Kuwait and

Qatar at most of the time are overvalued while Bahrain and Oman are undervalued. The study also has shown that all GCC member countries are enjoying positive trade balance. Utilising two-step Granger co integration technique we find a significant relationship between the exchange rate deviation and trade balance for most of the member countries in the long run but not in the short-run.

In the long term, there is significant relationship between deviation of the exchange rate and trade balance. This is evident for the GCC member countries that the policy makers should not totally ignore the important role of exchange rate policy in influencing trade balance, especially in the long run for the benefit of their trade balance.

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