# *Do GCC Countries form an Optimum Currency Area? An Empirical analysis of the Generalized Purchasing Power*

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**Abstract:**

The objective of this study is to examine the possibility of optimum currency area in GCC countries, namely Saudi Arabic, Bahrain, Kuwait, Oman, Qatar and United Arab Emirates during the period 1981-2013, by applying the Generalized Purchasing Power Parity (G-PPP) and by using Real Exchange Rate (RER) Data. Our empirical results show a long term relationship among real exchange rates, which confirms that, envisaged monetary integration in GCC.

**Keywords:** Common currency area, Monetary union, Fixed exchange rate policy, G-PPP.

**الملخص:**

تهدف هذه الورقة البحثية لدراسة امكانية تحقيق منطقة نقد مثالية بين دول مجلس التعاون الخليجي وهي السعودية والامارات العربية المتحدة والبحرين والكويت وقطر وعمان خلال الفترة 1981-2013 باستعمال نظرية تعادل القوى الشرائية المعممة (GPPP) وباستخدام بيانات أسعار الصرف الحقيقية، وتشير نتائج الدراسة الى وجود علاقة توازنية طويلة الأجل بين أسعار الصرف الحقيقية لدول المجلس، مما يؤكد امكانية قيام تكامل نقدي فيما بينهم.

**الكلمات المفتاحية**: منطقة النقد المثالية، الاتحاد النقدي، أنظمة سعر الصرف الثابتة، نظرية تعادل القوى الشرائية المعممة.

## I. Introduction

In a world of economic crises, the financial and monetary cooperation has become an essential element in the prevention of those crises. Thus to resolve this issue, countries should develop regional monetary policy cooperation, among which we find GCC countries.

In these last decades, the GCC countries have reached remarkable achievements in different fields especially in the economic field that supports the economic integration among them towards the monetary union. The genesis of Gulf Cooperation Council of the Gulf countries is back to the mid 1970s. It was effectively established in March 1981 and it included Saudi Arabia, Kuwait, Qatar, Bahrain, United Arab Emirates and Oman. (The Cooperation Council - Charter , 1991)

Besides, **it consists of: the Supreme Council**; which is the highest authority of the Cooperation Council and shall be formed of heads of member states, t**he Ministerial Council** that shall be formed of the Foreign Ministers of the member states or other delegated ministers and t**he Secretariat General** that shall be composed of a General Secretary who shall be assisted by assistants and a number of staff as required. The Supreme Council shall appoint the General Secretary, who shall be a citizen of one of the Cooperation Council states, for a period of three years, which may be renewed once only. Each of these organizations may establish sub-agencies as may be necessary. (The Organizational Structure, seen at 2013)

Furthermore, the **main objectives of the GCC as follows** (The Cooperation Council - Charter , 1991):

- ✓ Achieving coordination, integration and coherence among the GCC countries in all areas towards the monetary union.
- ✓ Deepening and strengthening the links and the fields of cooperation already existing among their peoples in various areas.
- ✓ Developing rules of law (regulations) in different fields, including the following: economic and financial affairs; trade affairs, customs and communications; educational and cultural affairs; social and health affairs; information and tourism affairs; legislative and administrative affairs.
- ✓ Pushing ahead the wheel of the scientific and technological advancement in the fields of industry, mining, agriculture and water

and animal resources, and establishing research centers and joint ventures, and encouraging the private sector cooperation that.

Moreover, the GCC union has passed by **many stages** that can be summarized in the following points:

- ✓ The Unified Economic Agreement which was signed in 1981, (The Economic Agreement Between the GCC States, 2001), which provided the main provisions touching on a Free Trade Zone for the GCC countries and as was effected in 1983.
- ✓ The GCC states approved the new agreement in 2001 and replaced the agreement of 1981. This new agreement has become more comprehensive in addressing the following topics (The GCC: Process and Achievement , 2009):
    - Establishing The GCC Customs Union in 2003 and replaced free trade zone, where the common customs tariff of the GCC Customs Union shall be 5% on all foreign goods imported from outside. The Customs union with effect from 1st January 2003.
    - Establishing The GCC Common Market in 2008 that replaced Customs Union.
    - Establishing Monetary Union, As is well known, it was not possible to GCC countries to create a common currency, which was

programmed in the year 2010, which has been postponed to a later date determined by the monetary council.

Furthermore, how could the GCC countries achieve their purpose; which is the Optimum Currency Aria (OCE); that are related to choosing appropriate exchange rate policies. Consequently, several researches have attempted to investigate this problematic using different estimation method, among which the SVAR and the Generalized Purchased Power Parity (G-PPP) approach. In this paper we will use the G-PPP approach that is the most relevant for this purpose and it will be demonstrated latter.

The paper is organized as follows: in the first section, we will give an overview on OCA in GCC aria. After that, we will emphasize the main empirical evidences on the GPPP approach applied to the GCC countries in the section two. In the section three, we will test the OCA in the GCC countries. And finally, the main findings.

## II. Literature Review on Optimum currency area in GCC Countries

The idea of adopting the common GCC currency began with the establishment of the GCC. After that in 2001, the Gulf Cooperation Council decided to adopt the common currency by 2010, but it only led to a support in recent years due to the successful introduction of the common currency in

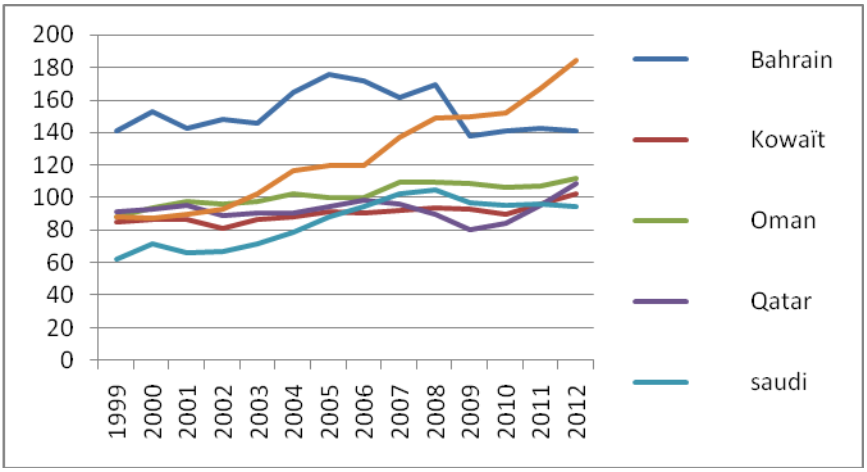
Europe. In 2005, the GCC members adopted the EU convergence criteria with respect to budget deficit, public debt, currency reserves, interest rates and inflation.

Thus, in order to test the OCA criteria in GCC countries and the achievements that they reached, we will distinguish two approaches the traditional approach and the Cost-benefit approach, and then, we will give a table that illustrate the eligibility test for OCA. (Al-Barwani, 2006)

First, *the traditional approach*, which consist of the following criteria: international factor mobility (Mundell, 1961), financial integration (Ingram, 1962), degree of openness of the economy (McKinnon, 1963), product diversification (Kenen, 1969), fiscal integration (Johnson, 1970), similarity of inflation rates (Fleming, 1971), similarity of growth rates, volatility of exchange rate and similarity of shocks.

In fact, the GCC countries have reached: a high degree of openness towards the external world and between each other, which the figure1 shows:

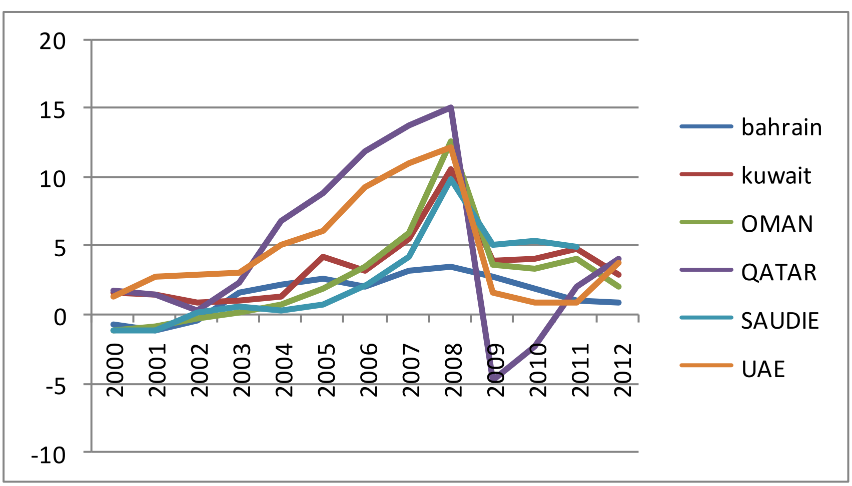
**Figure1: Degree of openness of GCC countries**




**Source: authors' construction based on UNCTADSTAT database.**

In addition to the similarity of inflation rates except for the Bahrain, which the figure2 illustrates:

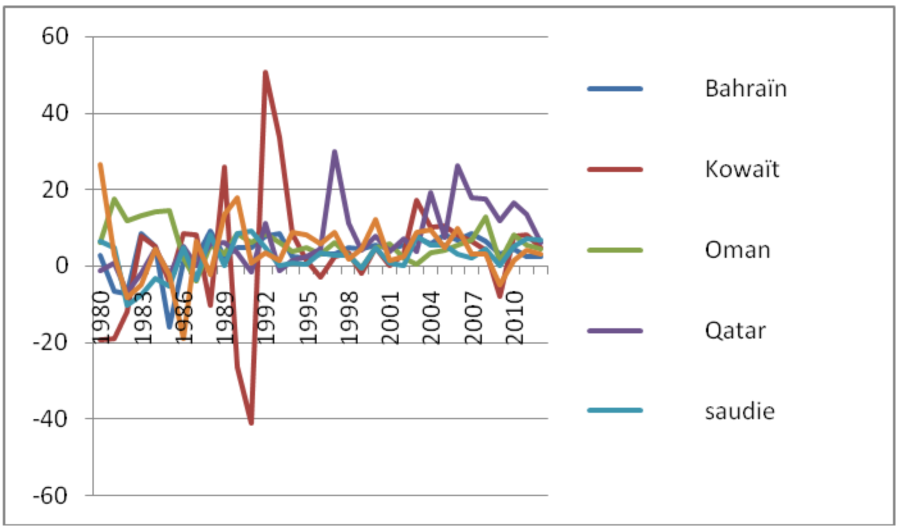
**Figure2: Inflation rates of GCC countries**




**Source: authors' construction based on Datastreem.**

Besides this, there is a similarity of growth rates among the GCC countries because they have the same structure of their economies, which explain the similarity of shocks especially external shocks. The figure3 shows the growth rates of GCC countries:

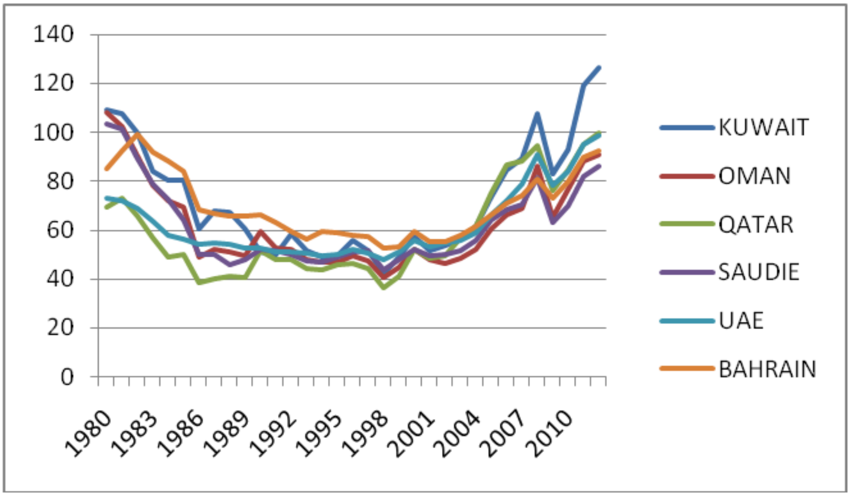
**Figure3: Growth rates of GCC countries**




**Source: authors' construction based on UNCTADSTAT database.**

As to the similarity of the exchange rate, the figure 4 shows an approximation between their exchange rates except for the Kuwait because it follows a different exchange rate.

**Figure4: Volatility of exchange rates of GCC countries**




**Source: authors' construction based on Datastreem.**

On the other hand, they didn't reach: the international factor mobility because of the lack in the labor force and the difficulty in its movement, financial integration and product diversification because the GCC countries are rental economies in which they depend on oil revenues.

Secondly, *the Cost-benefit approach* consists of evaluating the costs and benefits by the country before joining the currency area. Besides, the benefits of the currency area include external and internal benefits, which are: saving on foreign exchange reserves, elimination of transaction costs, reducing exchange risk, raising intra-trade and foreign investment. As to the costs, they include limiting the ability to adjust the exchange rate and losing of the individual autonomy in monetary, fiscal and exchange rate policies.

In the GCC countries, we found that the benefits exceed the costs of the currency area, which is due to the similarity of their fiscal and monetary policies, thus there is coordination between both those policies and a similarity of the external shocks.

The table1 summarize the applicability of OCA in GCC countries, basing on the criteria of both approaches:

**Table1: Testing the applicability of OCA criteria**

| OCA criterion | Favorable | Unfavorable |
|---|---|---|
| Traditional approach | - degree of openness<br>- similarity of inflation rates<br>- similarity of growth rates<br>- similarity of the exchange rate | - the international factor mobility<br>- financial integration<br>- product diversification |
| Cost-benefit approach | The costs are less than the benefits | / |

**Source: authors' construction.**

## I. Empirical review on GPPP approach

As it is known, the OCA is a pre-required condition for adopting a common exchange rate policy, and thus, a common currency among the integrated countries. To test the feasibility of the OCA in GCC countries, many economists used different estimation methods, among which the GPPP approach is the most appropriate. In this paper, we will use the GPPP estimation method during the period 1981- 2013, using the variable real exchange rate (RER) to test the achievement of the Optimal Currency Area (OCA) among the GCC countries, basing on some empirical evidences that the table 2 summarizes:

**Table2: Empirical evidences on the OCA using GPPP estimation method**

| Authors | Country | Period of study | Main findings |
|---|---|---|---|
| F. Zerihun & All | South African Development Countrie (SADC) | 1995- 2012 | A common integration relationship in the long term between real exchange rates of the African countries, thus there is a possibility of a monetary integration between them. |
| Kathryn J. Whittaker Huff | Association of South-East Asia | 2002- 2010 | These countries constitute an OCA, but it still faces set of challenges due to the difference in inflation rates and in the development of the financial system, which means that the |

| | | | |
|---|---|---|---|
| | | | deadline for achieving economic integration in the overall year 2020 may be difficult for some economies. |
| J. Anchieta Neves & All | Mercosur countries | 1970- 2006 | South American countries do not constitute an optimal currency area. |
| Belkacem Laabas & Imed Limam | GCC countries | 1960- 1999 | Both Oman and the United Arab Emirates are less homogeneous with the rest of the GCC countries to establish a monetary union. |
| Beatrice Kalinda Mkenda | The East African Community | 1981- 1998 | The existence of a common integration between real exchange rates in East Africa for the period 1981-1998, and even for the period 1990-1998, which means that the three countries tend to be affected by similar shocks. |

**Source: authors' construction.**

## II. Testing Optimum Currency Area for GCC

In this study we will use The G-PPP method,; which is based on a co-integrating relationship among a group of Real Exchange Rates (RER) that indicates the existence of common trends in the GCC countries macroeconomic fundamentals, and hence they satisfy one of the necessary conditions for an optimum currency area among them, during the period from 1981 to 2013. The data on RER is taken from the CHELEM database.

### Background on the Generalized Purchasing Power Parity Approach (GPPP approach)

There are several estimation methods used to test the OCA criterion, among which the GPPP approach and SVAR model, but it is found that the GPPP approach is more appropriate for this purpose because.

The Generalized Purchasing Power Parity (G-PPP) was developed by Enders and Hurn (1994) who extended this approach from the Purchasing Power Parity model that is based on the fact that there is a difficulty in achieving PPP because of exchange rate shocks. However, they found the RERs of the integrated countries depend not only on the changes in relative prices between them, but also on those of other foreign countries.

Besides this, they found that countries which share a common stochastic trend can form an OCA because of the similarity of output shocks that affect their RERS. This stochastic trend will lead to a common and stable relationship among their currencies, which support the formation of the OCA by fixing their exchange rate policies.

To examine this approach, we should apply the Johanson co-integration test whether there are cointegrated vectors between the exchange rates of the GCC countries, which means that we should to find if there is an equilibrium relationship between the bilateral real exchange rates, thus:

$$rer_{12t} = b_0 + b_{13}rer_{13t} + b_{14}rer_{14t} + \cdots + b_{1m}rer_{1mt} + \varepsilon_t$$

**Where**:

$rer_{1it}$ are the bilateral real exchange rates between the base country 1 and country *i* in period *t*, $b_0$ is the intercept term, $b_{1i}$ are the parameters of the co-integrating vector, and $\varepsilon_t$ is a stationary stochastic disturbance. (Falagiarda, 2010)

## ☙ Empirical study

Before applying the GPPP approach on the GCC countries, we will describe the variables of the study, as shows the table3:

**Table3: Descriptive Statistics of GCC countries Real Exchange Rate**

| | BRER | KRER | ORER | QRER | SRER | URER |
|---|---|---|---|---|---|---|
| Mean | 70.09646 | 72.41090 | 61.55446 | 59.87428 | 61.16348 | 63.17333 |
| Median | 66.17765 | 61.51526 | 52.09614 | 50.24922 | 51.90945 | 55.79151 |
| Maximum | 99.43620 | 126.4546 | 102.4758 | 99.93559 | 101.3333 | 98.62741 |
| Minimum | 52.43716 | 41.89414 | 40.30526 | 36.62934 | 43.54285 | 48.15869 |
| Std. Dev. | 14.13009 | 24.07778 | 17.07929 | 19.83894 | 15.56334 | 15.32277 |
| Skewness | 0.620575 | 0.808422 | 0.827392 | 0.780599 | 0.901398 | 1.141806 |
| Kurtosis | 2.012977 | 2.491059 | 2.422014 | 2.149429 | 2.656835 | 2.972844 |
| Jarque-Bera | 3.457668 | 3.950660 | 4.224520 | 4.346111 | 4.630773 | 7.171483 |
| Probability | 0.177491 | 0.138716 | 0.120964 | 0.113829 | 0.098728 | 0.027716 |

**Source: authors' construction using EVIEWS 6**

As shown in above Table, Kuwait has the highest values of the real exchange rate followed by Oman, Saudi Arabia, Qatar, Bahrain and United Arab

Emirates. but Qatar has the lowest compared to other countries. Besides this, All the countries' exchange rates are symmetrically distributed around the mean since the measures of skewness for each country is close to zero. The Jarque-Bera (JB) is a test statistic for testing whether the series is normally distributed. However, this test reveals that the probability is higher than 5% , which means that the series of GCC countries are not normally distributed.

And then we will use the Johansen co-integration test that is based on the following steps (Bourbonnais, 2011):

- ✓ Unit Root test :

We use for testing unit root Augmented Dickey Fuller, Phillips-Perron and KPSS test, the results obtained in the table4:

**Table4: Unit Root Test for GCC RER at Level**

| Real Exchange Rate | ADF | | | PP | | | KPSS |
|---|---|---|---|---|---|---|---|
| | Trend& intercept | Intercept | None | Trend& intercept | Intercept | None | Trend& intercept |
| SRER | 3,08- | 2,40- | 0,98- | 3,37- | 2,45- | 0,93- | 0,19 |
| ERER | 1,59- | 0,41 | 0,95 | 1,56- | 0,22 | 0,82 | 0,20 |
| KRER | 0,70- | 0,88- | 0,06- | 1,64- | 0,98- | 0,03- | 0,20 |
| QRER | 2,52- | 0,34- | 0,40 | 2,57- | 0,50- | 0,35 | 0,19 |
| ORER | 2,59- | 2,18- | 0,83- | 2,69- | 2,30- | 0,83- | 0,20 |
| BRER | 0,82- | 1,12- | 0,25- | 0,37- | 1,34- | 0,28- | 0.20 |

**Source: authors' construction using EVIEWS 6**.

The results represented in the table5 implies that the real exchange rate for GCC countries at level have unit roots but test statistics of the first difference for series conclude that the null hypothesis of unit root is rejected by all tests, This suggests that all series are best modeled as I (1).

**Table5: Unit Root Test for GCC RER at first difference**

| Real Exchange Rate | ADF | | | PP | | | KPSS |
|---|---|---|---|---|---|---|---|
| | Trend& intercept | Intercept | None | Trend& intercept | Intercept | None | Trend& intercept |
| SRER | *4,70- | *4,82- | *4,91- | *5,95- | *4,81- | *4,90- | *0,10 |
| ERER | *5,94- | *4,79- | *4,73- | *8,29- | *4,76- | *4,73- | *0,09 |
| KRER | *7,35- | *5,34- | *5,41- | *8,83- | *5,34- | *5,42- | *0,09 |
| QRER | *5,43- | *4,94- | *4,94- | *5,47- | *4,94- | *4,93- | *0,10 |
| ORER | *5,54- | *6,01- | *6,11- | *8,03- | *5,99- | *6,09- | *0,09 |
| BRER | *5,28- | *4,67- | *4,74- | *6,25- | *4,79- | *4,85- | *0,11 |

**Source: authors' construction using EVIEWS 6**

The next step focused on conducting a co-integration test:

- ✓ Cointegration Test Results

After ensuring the stationarity of all series for the real exchange rate for GCC countries and it integrated from the same degree I (1), This allowed us to proceed with the Johansen's co-integration analysis. Table 6 presents the result of testing for the number of co-integrating vectors**.**

**Table6: Test for co-integration between RER of GCC countries**

| Null Hypothesized | Alternative Hypothesized | Eigenvalue | Test Trace | | Test Max-Eigen | |
|---|---|---|---|---|---|---|
| | | | Trace Statistic | Critical Value 0.05 | Max-Eigen Statistic | Critical Value 0.05 |
| $R = 0$ | $R > 0$ | 0.924687 | 185.5321 | 95.75366 | 77.58299 | 40.07757 |
| $R = 1$ | $R > 1$ | 0.770333 | 107.9491 | 69.81889 | 44.13381 | 33.87687 |
| $R = 2$ | $R > 2$ | 0.732296 | 63.81533 | 47.85613 | 39.53616 | 27.58434 |
| $R = 3$ | $R > 3$ | 0.449841 | 24.27917 | 29.79707 | 17.92645 | 21.13162 |
| $R = 4$ | $R > 4$ | 0.190805 | 6.352721 | 15.49471 | 6.351477 | 14.26460 |
| $R = 5$ | $R > 5$ | 4.15E-05 | 0.001244 | 3.841466 | 0.001244 | 3.841466 |

**Source: authors' construction using EVIEWS 6**.

The results suggested that two is a long-run equilibrium relationship between the RERs of the currencies vis-à-vis the US dollar during the period under consideration and shows that the possibility of applying the common currency among GCC countries.

# I. Concludes and Policy Implications

In this paper, we attempted to examine the possibility of monetary union among the GCC countries, namely: Saudi Arabic, Bahrain, Kuwait, Oman, Qatar and United Arab Emirates using the approach of Generalized Purchasing Power Parity (G-PPP) that is based on Johanson co-integration test, and thus establishing the OCA, during the period from 1981 to 2013.

The main results emphasize that the time series of RERs are stationary at order one, which means that they are co-integrated in the same degree. Concerning the Johanson co-integration test, it shows that there is two co-integration relationships among the RERs of the GCC countries, which indicate that the GCC economies are similar, and thus, there is a symmetry of the external shocks. Basing on these results, the GCC countries satisfy the pre-conditions for the establishment of OCA. However,

The failure of the realization of the monetary union among these countries depend on the one hand; on economic factors which are the limitation of international factor mobility especially the labor force and product diversification because of the dependence on oil sector, and on political factors on the other hand.

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