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ARE GCC COUNTRIES AN OPTIMUM CURRENCY AREA?

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ABSTRACT:
In the light of the Euro's success, many countries seek to duplicate their accomplishment which can happen by unifying their currency. The Optimum Currency Area suggests that countries joining together and establishing a single currency could help improve their economy. This study aims at investigating the feasibility of an Optimum Currency Area among GCC countries. Co-integration analysis of the inflation and the GDP is examined in order to realize this aim. This study used both qualitative and quantitative approach to evaluate the optimality of GCC countries for a currency union and determine the correlation and co-integration of the variables respectively. The co-integration between GCC countries in terms of inflation and GDP were evaluated through EViews software. Data from the years 1980 to 2014 were used in this study for this purpose. Findings suggest that GCC countries have yet to fulfill only one criterion. Thus, this study concluded that GCC countries are not yet fully an Optimum Currency Area.

INTRODUCTION:

One of its main goals when the Gulf Cooperation Council was established in the early 1980s was to establish a common currency. Seeing the Euro's success since its establishment, it was decided in 2001 that GCC countries were to introduce a common currency by 2010. By the year 2005, GCC countries have, with the exception of inflation, fulfilled the Euro Convergence Criteria in terms of budget deficit, public debt, currency reserves, and interest rates. However, many believe that these countries' development has been slow and for the currency union to be successful, GCC countries need to have move more and faster [1].

Currency “monetary” union is when a group of courtiers adopt a single currency. Monetary unions are very rare since most countries prefer to have their own independent currency. Usually, currency unions are adopted by poor countries, where they would adopt the currency of a richer country. For example, Panama, El Salvador, and Ecuador are all depended on the American dollar. Many countries used to adopt the currency of its colonizer; this is known as the official dollarization, while the unofficial dollarization is when a foreign currency is used in a country but not as its national currency [2].

OCA is composed of several criteria that were introduced by Mundell in 1961, and the remaining criteria were contributed later by other economists [3]. Mundell believed that labour mobility is the most important criterion [3]. Geographic mobility could give workers the opportunity to move from areas that are suffering from depression to other areas, thus shocks suffered in those particular areas could be reimbursed and the need for a new monetary policy would be eliminated. Wages and prices should be flexible as well, where the economy of these countries should be able to respond to fluctuations in demand and supply. Financial integration is also an important factor as it could help depressed areas by moving savings from places that have surpluses to those areas, as a result asymmetrical shocks would be alleviated [4]. However, AlKholifey and Alreshan [5] criticized OCA as being silent on the fact that flexible wages and labor mobility are necessary for a successful monetary union.In the following years, many other factors were added as criteria. McKinnon [6] argued that it is important for a country seeking to become part of a common currency area to be involved in international trade, where the more involved the country is in international trade, the more benefits it would gain from the integration; i.e. the effect that depreciation has in rebalancing the country’s external deficit would be reduced. According to Kenen [7], countries with diversified economies should find better results with currency integration, where shocks affecting either demand or supply in one sector could be compensated with another sector. Fleming [8] believes that countries in a monetary union need to have similar inflation rates, since they are important in keeping current accounts in these countries balanced. However, Mintz [9] argued that economic factors are not as important as political factors. He was supported by Haberler [10], who believed that currency integration cannot succeed without political integration [11].

Khan [12] believes that looking at the past, the best option for GCC countries is to peg their single currency to the dollar since the dollar has helped their economies since they started pegging to it. The dollar has helped the GCC region become more stable in the external environment, it also was a reliable nominal anchor for the monetary policy, and made it easier for these countries to trade their products and practice financial transactions and accounting, this is mainly due to the fact that most export transactions rely on the dollar. Also, it was an important factor in GCC countries’ journey towards the monetary union, just like what the exchange Rate Mechanism (ERM) did for the European Monetary Union. Therefore, Khan suggests that GCC’s single should start off with pegging to the dollar and it can change to either pegging

to a basket of dollar-euro or by managing floating in the future, depending on how the economy goes [12].

The aim of this study is to study the optimality of GCC countries' of having a successful currency union, by studying the co-integration of two of its main variables which are GDP and inflation. It is important for GCC countries to learn from past experiences such as the euro zone in order to optimize the benefits of their union. This study will be using the Optimum Currency Area criteria, which was introduced by Robert Mundell in 1969 [3].

METHODOLOGY

This part consists of two parts which is qualitative and quantitative. In the qualitative part, the optimality of GCC countries for a currency union will be evaluated. In the quantitative part the correlation and co-integration of the variables will be tested.

Data

Qualitative Data

There are two well-known criteria used to discuss whether a group of countries are ready for monetary union. There two criteria are the Euro Convergence Criteria and the Optimum Currency Area. Due to the fact that most researchers such as Benbouziane et al. [1] used the Optimum Currency Area criterion to decide whether GCC countries are ready to establish a single currency and the fact that the other criterion is used to discuss if a country is ready for to join the Euro area, this study use the Optimum Currency Area theory.

Quantitative Data

The two main variables that used in this study are GDP as well as inflation. This study will measure three aspects of these two variables. First, the value of mean, variance, standard deviation, maximum, and minimum numbers of GDP and inflation were executed form Microsoft Excel. Second, Microsoft Excel will be used to determine the correlation of GCC countries in terms of inflation and GDP. EViews software will be used to determine the co-integration of GCC countries in relation of the two variables. The research will be conducted from 1980-2014. The data will be on an annual basis since most data that are related to GCC countries are reported annually. The variables in this study, which are GDP and inflation, were obtained from the IMF. GDP will be used as a measure for Openness, while inflation is used to measure similarity in inflation rates.

The Model

Mean, Variance, Standard Deviation

The arithmetic mean is the average of a set of numbers. The variance measures dispersion, it is the mean squared deviation of the mean. The standard

deviation is the square root of the variance. The three measurements (mean, variance and standard deviation) are significant in psychometrics. In Finance standard deviation is used to measure risk (volatility) or uncertainty. The maximum and minimum formulas will be also used to determine the best and worst years for GCC countries in terms of Inflation and GDP.

Correlation Model

This study will measure the correlation between GCC countries in the above mentioned variables. Microsoft Excel will be used to determine this factor. (+1) being perfectly positively correlated and (-1) being perfectly negatively correlated. The positive relationship means that if one country moves in a certain direction, the other country will move in the same direction. However, the negative relationship means that if one country moves in a direction, the other will move in the opposite direction. Finally, if the correlation between the two countries is (0) then there is no correlation between them.

Co-Integration Model

In this study, EViews software is used to measure the co-integration between GCC countries in terms of inflation and GDP. EViews is econometric and forecasting software which was originally developed by the Quantitative Micro Software (QMS). It can be used by governments, students, companies, researches, and so on. The Johansen co-integration test will be used to test whether or GCC countries have a long run relationship in terms of GDP and inflation. In this software, the Augmented Dickey-Fuller (ADF) Unit Root Test is performed, this test can tell us whether a particular variable has got a unit root or not. This Method has two likelihood ratio tests, namely the trace test and the maximum eigenvalue.

Hypothesis

Null hypothesis H01: assumes that the variable is not stationary or got unit root. If the (P) value is more than 5%, we accept the null hypothesis. Alternative H02: stationary.

RESULT AND DISCUSSION

Two main variables are used in this study to account for the integration these are GDP (in billions $) as well as inflation over the period: 1980-2014. These two variables will determine two aspects of the Optimum Currency Area, which are openness, and similarity of inflation.

Mean, Variance, Standard Deviation

In terms of GDP, according to Table 1, Saudi Arabia seems to have the highest variability; its GDP is the highest with ($ 772.61). On the other hand, Bahrain has the lowest variability, thus its maximum GDP is less than half that is of Saudi Arabia.

Table 1: Statistical analysis of each country on GDP

Country	Mean	Std. dev	Variance	Max	Min
Bahrain	11.72	9.6305	92.7470	33.494	3.138
Kuwait	59.06	55.5478	3085.5639	185.319	10.826
Oman	26.11	23.5003	552.2656	82.254	6.342
Qatar	44.71	63.5961	4044.4751	213.784	4.95
KSA	264.22	206.6687	42711.987	772.61	85.406
UAE	132.90	121.1569	14679.012	412.35	29.568

In terms of inflation, based of Table 2, United Arab Emirates suffers from the greatest variability. Thus, its maximum inflation was the highest as well. However, its minimum inflation year was less than Saudi Arabia whose variability was the lowest.

Table 2: Statistical analysis of each country on inflation

Country	Mean	Std. dev	Variance	Max	Min
Bahrain	93.82	12.0394	144.9473	121.466	70.491
Kuwait	101.85	30.7416	945.0476	166.512	55.089
Oman	108.17	20.6716	427.3152	156.069	79.8
Qatar	145.21	56.8314	3229.8085	254.131	74.405
KSA	97.73	11.5655	133.7613	130.502	86.9
UAE	146.06	60.4567	3655.0133	254.948	66.7

Correlation

Table 3 and Table 4 reflected the evident that GCC countries are highly correlated in terms on GDP and inflation. However, being correlated doesn't mean that they are ready for currency union. Thus, it is important to study other factors such as co-integration.

Table 3: Correlation analysis of each country on GDP

	Bahrain	Kuwait	Oman	Qatar	KSA	UAE
Bahrain	1					
Kuwait	0.987	1				
Oman	0.991	0.990	1			
Qatar	0.968	0.980	0.988	1		
KSA	0.983	0.991	0.991	0.989	1	
UAE	0.998	0.993	0.993	0.973	0.989	1

Table 4: Correlation analysis of each country on inflation

	Bahrain	Kuwait	Oman	Qatar	KSA	UAE
Bahrain	1					
Kuwait	0.956	1				

Oman	0.928	0.962	1			
Qatar	0.954	0.967	0.940	1		
KSA	0.910	0.854	0.919	0.854	1	
UAE	0.957	0.980	0.943	0.994	0.845	1

Co-integration

Optimum Currency Area and co-integration are interrelated, where most OCA-based researches relied on the Johansen Co-integration Test. It was used by Ghartey [13] study whether or not the Caribbean community constitutes an Optimum Currency Area. In another study made by Sideris et al. [14], the Johansen co-integration test was performed to study the readiness of six new Member States of adopting the Euro. Finally, Taguchi [15] conducted a study to evaluate the feasibility of having a currency union in Asia, where he relied on the co-integration test. First, it is important to perform the ADF Unit Root Test to identify the capability for co-integration, where data has to be non-stationary.

ADF Unit Root Test

Null Hypothesis H0 : assumes that the variable is non-stationary or has unit root.
Alternative H1 : the variable is stationary.
Based on the ADF test results for all Member States of GCC which shown in Table 5 and Table 6, the variables are non-stationary or has a unit root. The null hypothesis in each variable is integrated of order 1 I(1). Thus, proceed to do the co-integration test.

Table 5: ADF test results of each country on GDP

Country	ADF t-statistic Test	Test Critical value at 1%	Test Critical value at 5%
Bahrain	2.833925	-3.639407	-2.951125
Kuwait	1.143530	-3.639407	-2.951125
Oman	2.574712	-3.646342	-2.954021
Qatar	3.345824	-3.639407	-2.951125
KSA	2.266349	-3.639407	-2.951125
UAE	2.135678	-3.639407	-2.951125

Table 6: ADF test results of each country on inflation

Country	ADF t-statistic Test	Test Critical value at 1%	Test Critical value at 5%
Bahrain	0.119095	-3.639407	-2.951125
Kuwait	1.113028	-3.646342	-2.954021
Oman	0.585804	-3.646342	-2.954021
Qatar	0.350079	-3.646342	-2.954021
KSA	0.860245	-3.646342	-2.954021

UAE	0.138767	-3.646342	-2.954021

Johansen Co-integration Test

Table 7 and Table 8 indicate both the Trace test and the max-eigenvalue demonstrate that there are three co-integrating vectors among the data series.

Table 7: Trace test on GDP

Null Hypothesis	Trace Statistic	0.05 Critical Value
None *	191.7959763	95.75366142
At most 1 *	126.4120018	69.81888745
At most 2 *	65.00931794	47.85612716
At most 3	26.7250619	29.79707334
* denotes rejection of the hypothesis at the 0.05 level Trace test indicates 3 co-integrating eqn(s) at the 0.05 level		

Table 8: Max-eigenvalue on GDP

Null Hypothesis	Max-Eigen Statistic	0.05 Critical Value
None *	65.38397454	40.07757358
At most 1 *	61.40268386	33.87686662
At most 2 *	38.28425604	27.58433779
At most 3	15.93900872	21.1316163
* denotes rejection of the hypothesis at the 0.05 level Max-eigenvalue test indicates 3 co-integrating eqn(s) at the 0.05 level		

Both tests result in Table 9 and Table 10 showed conflicting results in terms of inflation. The trace test showed that there are four co-integrating vectors among the data series, while the max-eigenvalue test showed that there are two co-integrating vectors. According to Nguyen [16], the max-eigenvalue test is preferable in the case of conflicting results since it provides the sharper alternative hypothesis.

Table 9: Trace test on inflation

Null Hypothesis	Trace Statistic	0.05 Critical Value
None *	151.1561739	95.75366142
At most 1 *	93.49246346	69.81888745
At most 2 *	57.18475596	47.85612716
At most 3 *	30.74035975	29.79707334
At most 4	12.93487045	15.49471288
* denotes rejection of the hypothesis at the 0.05 level Trace test indicates 4 co-integrating eqn(s) at the 0.05 level		

Table 10: Max-eigenvalue on inflation

Null Hypothesis	Max-Eigen Statistic	0.05 Critical Value
None *	57.66371047	40.07757358
At most 1 *	36.3077075	33.87686662
At most 2	26.44439621	27.58433779
* denotes rejection of the hypothesis at the 0.05 level Max-eigenvalue test indicates 2 co-integrating eqn(s) at the 0.05 level		

Summary of Findings

It evident from the Table 11 that six out of the seven most used Optimum Currency Area criteria has been fulfilled. This suggests that GCC countries need to work more on satisfying the one criterion that is left in order to become ready for a monetary union, where the region's main disadvantage and obstacle is its reliance on the oil sector. However, these countries are considered young in terms of establishment, economies, and policies and so on. Thus, fulfilling six out of seven criteria should encourage them to complete the one criterion left and establish their own single currency. The main finding in this study is that GCC countries are not yet an Optimum Currency Area.

Table 11: The status of the OCA criteria

OCA Criteria	Status
*Openness	Fulfilled
Mobility	Fulfilled
Degree of Policy Integration	Fulfilled
*Similarity of Inflation	Fulfilled
Production Structure	Fulfilled
Commodity Diversification	Unfulfilled
Political Factors	Fulfilled
*qualitative evaluation as well as co-integration analysis used	

CONCLUSION

The study aim to identify the feasibility of GCC countries are an Optimum Currency Area. This was examined by studying the correlation, co-integration, variability (standard deviation and variance) of two major variables in the OCA theory, which are inflation and GDP. The analysis in this study shows that GCC countries have in fact made great efforts in order to reach its goal of establishing a common currency. However, they still have a long way before they can introduce a successful single currency. The two main variables used in this study played a critical part in the conclusion; the correlation test revealed that GCC countries are highly correlated when it came to GDP and inflation. The Johansen co-integration test indicated that GCC countries are co-integrated in both variables. However, there was significant variability in GCC countries when it came to the two main variables. Finally, the fact that

they were supposed to introduce their common currency four years ago, shows that they have deviated from their objective and they need a new strategy to make up for the lost time. Overall, this study shows that GCC countries are not yet ready for currency integration.

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