

Microeconomic Convergence and Prospects for Monetary Integration in the GCC: An Empirical Inquiry

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1. Introduction

Over the last few decades, the world has witnessed the emergence of a number of regional economic groupings. As noted by Cooper (1968), the increased interdependence among national economies can either enhance or constrain their ability to pursue domestic objectives. Therefore, countries face the challenge of balancing between their desire for autonomy and the limits set by interdependence. This naturally depends on the relative weights each country gives to internal and external considerations, and over time the situation may evolve either toward more cohesion and convergence or divergence.

The creation of the Gulf Cooperation Council (GCC hereafter) is the natural outcome of the political, economic and social conditions prevailing in the region and the constraints imposed by the international environment. The GCC aims at strengthening both the political and economic ties between its members, through better institutional cooperation and enhanced policy coordination. The GCC's economic objectives are clearly spelled out by the Unified Economic Agreement in its article 22.

However, the process of implementing the project of economic unification among the Gulf states has been too slow. Does this imply that

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conditions for regional complementarity have worsened, or that the scope for macroeconomic convergence and coordination has become limited? The transition or the move to a higher level of monetary integration depends on the level of convergence achieved in the previous stage. Therefore, progress made with regard to economic and monetary convergence (in particular with regard to inflation performance, budget positions, exchange rate stability and interest rate) must be evaluated to assess the prospects for a successful monetary integration.

The issue of economic integration among the Gulf states has occupied a number of researchers and practitioners, whose focus was either on evaluating the conditions for macroeconomic policies coordination (Iqbal 1987; Al Hamad 1990; Al - Mijren 1991; Al-Mineef 1994) or on testing the empirical validity of PPP and its relevance to monetary integration (Al-Bazaie and Al-Turky 1993) or on examining the obstacles hindering the GCC's unification project (Al-Kaweez 1994). However, The issue of macroeconomic convergence, which remains restricted within the narrow area of similarity and homogeneity of the present economic systems and policies, and the joint work of the GCC institutions, has not been fully investigated. Further empirical research on the transition to monetary integration (the level of convergence achieved) in the context of the GCC, remains to be undertaken.

The purpose of this paper is to empirically evaluate the achievements of and the prospects for macroeconomic convergence in the GCC in light of more than one decade experience of cooperation and concertation.

Convergence can be defined as the narrowing of the inter-countries differences as reflected by certain economic indicators (e.g. inflation performance, budget positions, exchange rate stability and interest rate developments). In a statistical sense, convergence also means that selected countries' economic variables cannot drift apart in the long run and hence, common stochastic trends should be found⁽¹⁾. In addition to examining the GCC states' records on macroeconomic performance, the paper also, employs two testing methods to provide further insights into the issue of macroeconomic convergence. It applies the Johansen (1988) multivariate cointegration approach to test the extent of convergence across countries, and the factor analysis approach to detect the number of common factors underlying the sets of the selected macroeconomic variables.

(1) A similar argument can be found in Karfakis and Moschos (1990) and Hall et al (1992).

The outline of the paper is as follows. Section 2 discusses the issue of macroeconomic convergence. Section 3 examines the macroeconomic performance achieved. Section 4 briefly describes the testing methodology and interprets both the multivariate cointegration results and the factor analysis results. Conclusions and limitations are stated in section 5.

2. The Issue of Macroeconomic Convergence: An Overview

A number of criteria have been suggested to assess the prospects for monetary integration. Mendell (1961) emphasizes factor mobility. He demonstrates that the higher the factor (labor) mobility the more attractive for countries to form a monetary union. He also argues that common language and cultural background tend to enhance labor mobility. McKinnon (1963) asserts that the degree of openness as measured by the importance of tradeables determines the optimum size of a currency area. In other words, countries with a high degree of openness ought to approach a monetary union with a large country or a group of large countries. Kenen (1969) urges economies with a high degree of product diversification to form a currency area, because countries with diversified production and consumption patterns tend to experience a relatively low degree of real exchange rate variability. Vaubel (1978, 1988) also, argues that only countries with small real exchange rates variability, with similar preferences for price stability, similar productivity trends and highly diversified goods and financial markets are appropriate candidates for a monetary union. The Vaubel criterion incorporates all the other criteria.

Fiscal restraints (such as balanced budget provisions or ceilings on deficit) are regarded as one of the basic elements of an economic union in conjunction with a monetary union. This reasoning focuses on a moral hazard problem in a monetary union which reduces the fiscal discipline of its members (Lamfalussy 1989). Dornbusch (1991), argues that fiscal convergence is commonly recognized as the sine qua non for full monetary integration. A poor record in fiscal policy can be a threat or an impediment to a serious monetary policy.

Anderton et al (1991) argue that economic convergence within the EMS is a precondition for further movement towards economic and monetary integration. Four criteria are set for the transition: inflation performance, budget positions, exchange rates stability and interest rate convergence. A price performance that is sustainable and an average rate of inflation that does not exceed that of the, at most, three best performing member states

by more than 1.5 percentage point; an actual general government deficit that should not exceed 3 per cent of GDP and the gross nominal government debt to GDP ratio should not exceed 60 per cent record on exchange rate movement, that is, narrow fluctuation margin without severe tensions; and finally, nominal long term interest rates must not have exceeded that of, at most, three best performing member states by more than 2 per cent.

Cooper (1976) argues that in addition to economic factors, non-economic factors such as cultural background and historical experience can be important factors for the viability of a monetary union. Along the same line, Guitian (1988) argues that criteria classified as subjective have also been postulated to determine the appropriate scope of monetary integration. These are commonality of aims and similarity of policy attitudes.

Given the criteria and prerequisites for a successful monetary integration, where does the GCC experience stand? Are the conditions in GCC members suitable for a smooth transition toward a monetary union? The other question to ask is whether a monetary union (M) ought to bear special constraints or opportunities which would favorably influence the scope of macroeconomic convergence (M) as a convergence device.

These questions and others are discussed by examining the GCC members' record in terms of macroeconomic performance, and also empirically testing the macroeconomic convergence hypothesis. It is worth noting that the cointegration technique has been used to test issues such as the factor price equalization in the CECD (Burgaman et al. 1993), inflation convergence in the EMS (Caporale and Pittis 1993) and financial integration in the 1920s (Darbar et al. 1993). Likewise, the principal components technique has also been used to assess the prospects for monetary convergence within the European Monetary System (Russo and Tullio 1988).

3. Some Facts on the GCC Achievements Towards Economic Cooperation

The countries that make up the Gulf Cooperation Council (GCC) - Bahrain, Kuwait, Qatar, Saudi Arabia, the United Arab Emirates and Oman - formed the GCC in February 1981 for the purpose of strengthening coordination and cooperation in the areas of regional economics, politics

and defense (Article 4 of the GCC charter). Article 22 of the Unified Economic Agreement between the GCC countries, states that all the member states ought to coordinate their financial, monetary and banking policies, and increase the cooperation between monetary agencies and central banks, including the work towards currency unification to be a complement for economic integration.

The GCC members play an important role in today's world economy. Together their proven reserves are estimated at 270 billion barrels, equivalent to about 45 percent of the free world's proven reserves (Nimatallah 1984). Oil export earnings accrue directly to governments. As a result, government spending has been the major determinant of economic activity in the non-oil sectors. Moreover, the GCC members own substantial financial assets, invested abroad, and they are also, major importers of goods and services from the rest of the world.

3.1 The convergence analysis

This section attempts to evaluate the level of macroeconomic convergence achieved by the GCC members, and assess the prospects for further convergence. Macroeconomic convergence can be defined as the narrowing of inter countries differences as reflected by some selected economic variables. First, exchange rate and consumer price movements are discussed. Then, the behavior of monetary variables such MB, reserve money and the three months Gulf currencies rates, is analyzed. At last, indicators of both external and internal imbalances are evaluated.

The data set, which consists of annual observations for some variables and monthly observations for others, is collected from the IFS (International Financial Statistics), the AMF (Arab Monetary Fund) and the various SAMA (Saudi Arabian Monetary Agency) reports. It includes the money supply (MB), the consumer price index (CPI), the fiscal deficit as a percentage of GDP (FY), the reserve money as a percentage of GDP (RM), the overall balance as a percentage of GDP (OB), the three months Gulf currencies deposit rates (IR) and the nominal exchange rates (ER). Data on Both IR and ER are monthly observations starting from April 1989 to March 1993. The period covered by the data set for the other variables runs from 1970 through 1993. Because of the second Gulf war, 1990 data for Kuwait are missing.

Table 1: Descriptive Statistics of Selected Macroeconomic Indicators

Indicators ^a	ER	CPI	M3 ^b	IR	FD	DB
Saudi	5.082 (0.204)	101.7 (3.82)	4.33 (1.03)	5.50 (2.21)	-14.10 (12.8)	-2.57 (3.56)
Kuwait	0.410 (0.015)	108.9 (10.75)	7.92 (0.76)	8.18 (0.93)	5.70 (11.7)	0.26 (7.22)
U.A.E	5.054	95.2 (0.112)	10.17 (4.54)	5.11 (0.91)	-2.37 (2.42)	n.a. (3.35)
Qatar	5.011 (0.111)	90.8 (7.71)	8.69 (0.91)	5.19 (1.62)	-5.02 (10.66)	n.a.
Oman	0.529 (0.012)	94.0 (11.4)	6.02 (0.98)	5.18 (1.87)	-10.12 (6.03)	1.51 (5.05)
Bahrain	0.518 (0.012)	100.6 (2.21)	6.29 (0.73)	5.35 (2.38)	-3.29 (4.85)	-0.87 (6.12)

a The numbers in parentheses are the standard deviation, and those above them are the mean. b Expressed in log-form.

Exchange rate movements (ER): In terms of volatility, as proxied by the standard deviation of the nominal exchange rates, the GCC members exhibit quite a similar pattern of variability (see Table 1). However, worth noting is the relatively higher volatility of the Kuwaiti dinar exchange rate observed in the post Gulf war period (i.e. 1991-1993).

Inflation (CPI): In the area of price performance, the average inflation rates are not high (see Table 1). However, there seems to be an overall upward trend in consumer price differentials (relative to Saudi Prices) for all countries, with the exception of Bahrain (see figure 2). Also worth observing is that inflation differentials tended to widen after 1985, with the

United Arab Emirates and Oman diverging the most compared to the rest of the group.

Money supply (MB): The GCC members clearly exhibit the same trend pattern, particularly after 1984, where a relatively less expansionary trend is observed (see figure 3). But during the post 1985 episode, the GDP growth has been remarkably slow, and even negative for some countries. Perhaps, the less expansionary monetary policy was aimed at inhibiting any inflationary bias.

Interest rates (IR): With the exception of Kuwait, the other GCC members have on average, shown lower interest rates than Saudi Arabia (see Table 1). A narrow convergence is again noticed among the group comprising Saudi Arabia, Oman, Qatar, the United Arab Emirates and Bahrain (see figure 4). This can be explained by the relatively stable monetary policy (i.e. constant money growth rate) adopted in these countries after 1985.

Fiscal deficit: Overall, the GCC members without exception, have, with unequal degree, gone through a period of sustained fiscal deficit, with Saudi Arabia and Oman showing the highest fiscal deficit record (see Table 1). The Saudi fiscal deficit as a ratio of GDP (FY) exhibits a cycle. An extended trend towards a worsening in the fiscal budget up to 1987, followed by a trend towards an improvement, which was reversed after 1990. Bahrain has been facing a fiscal deficit ever since 1983. Oman's fiscal budget has run into a deficit on two occasions. The worst was in 1986. The United Arab Emirates were facing a fiscal deficit from 1986 until 1990. Qatar's fiscal deficit persisted from 1987 until 1990. Kuwait in contrast, faced for the first time in 1990, a fiscal deficit which tended to worsen thereafter. It can be concluded that fiscal policy in the GCC countries has been overly expansionary. Given the restrictive nature of monetary policy and the somewhat slower output growth, the expansionary fiscal policy may have been inflationary. Consequently, taking into account the overall GCC fiscal performance, convergence conditions call for corrective fiscal measures, otherwise the financing of excessive public deficits would induce pressures on monetary policy to make it switch to a less price stability oriented stance.

The analysis of the macroeconomic performance achieved by the GCC members seems to reveal the existence of disparities, particularly in the area of fiscal budget and external balance. To what extent are these findings supported by the empirical evidence? This question is investigated next.

4. Testing Methodology

If the GCC members were tied together through economic cooperation and policy coordination. Evidence for cointegration between their macroeconomic variables would be expected. To test whether the selected macroeconomic variables (i.e. MB, CPI, IR, ER, RM, FY, OB) move together and to what extent this co-movement reveals the existence of common components, which would imply a reduction to a more parsimonious and possibly more informative structure, two statistical testing approaches are used: multivariate cointegration and factor analysis. The multivariate cointegration approach enables us to draw inferences on the co-movement of the selected set of variables. Factor analysis, on the other hand, helps identify underlying dimensions of communalities among variables.

4.1 The multivariate cointegration tests

Cointegration and common trends (Granger 1983; Engle and Granger 1987; Johansen 1988; Stock and Watson 1988), and common features (Engle and Kozicki 1993) are examples of the recent developments in the study of common components in time series.

An indicator of comovement among stationary series is codependence. A strong form of codependence is the serial correlation common feature as defined by Engle and Kozicki, (1990). Another indicator of comovement among non-stationary variables is cointegration. When the non-stationary variables are cointegrated, they share some common stochastic trends that drive their long swings, and at least one linear combination of them exists, which has no long swings, (i.e. is stationary).

The degree of common monetary features across the GCC countries is tested using multivariate cointegration. In the cointegration approach, the existence of a long run relationship between the nonstationary time series

is investigated by examining the stability of derivations from the relationship. If no time series are found to be cointegrated, the result would be consistent with the hypothesis that they possess a long run relationship. Since the study is dealing with a large number of variables, the cointegrating vector may not be unique.

Several different tests of cointegration have been developed. The approach used in this paper draws from the works of Johansen (1988) and Ohansen and Juselius (1990). This approach has the merit of enabling testing for more than one cointegrating relationship. The procedure involves a step-wise testing in which the null hypothesis of zero cointegrating vectors is first tested; if it is rejected, then the null of only one cointegrating vector is tested, and the procedure continues in a comparable way to test for higher order cointegrating vectors.

Let X_t be a vector of P nonstationary time series. Assume that X_t can be represented as vector autoregression (VAR)

$$X_t = \pi_1 X_{t-1} + \pi_2 X_{t-2} + \dots + \pi_k X_{t-k} + \mu + e_t \quad (1)$$

where $\pi_1, \pi_2, \dots, \pi_k$ are $P \times P$ matrices of coefficients and μ is a $P \times 1$ vector of constant or drift term. Equation (1) can be rewritten as

$$\Delta X_t = \Gamma_1 \Delta X_{t-1} + \Gamma_2 \Delta X_{t-2} + \dots + \Gamma_k \Delta X_{t-k} + \pi X_{t-k} + \mu + e_t \quad (2)$$

where

$$\Gamma_i = -(I - \pi_1 - \dots - \pi_i), \quad i = 1, \dots, k-1,$$

and

$$\pi = -(I - \pi_1 - \dots - \pi_k).$$

Equation (2) is expressed as a traditional VAR in first differences except for the term πX_{t-k} . The matrix π is called the long run impact matrix. There are three possible cases for the rank of π ($r(\pi)$, hereafter)⁽²⁾. First, if $r(\pi) = 0$ then $\pi = 0$, all of the processes in X_t are non-stationary, and no cointegrating relationship exists. Equation (2) therefore, is a difference

(2) A way to test for the number of co-integrations relations is to examine the rank of π , which is equal to the number of nonzero eigenvalues. This can be thought of as the multivariate analog of testing for unit roots in a univariate time series.

VAR model. Second, if $r(\pi) = P$, then all of the variables in X_t are stationary in levels. Finally, if $r(\pi) = r$, where $0 \leq r \leq P$, then there are r cointegrating vectors or stationary long run relationships among the P variables in X_t and $P-r$ common stochastic trends. In this case there exist matrices α and β of dimension $P \times r$ such that $\pi = \alpha \times \beta'$. The r cointegrating vectors β have the feature that $\beta'X_t$ is stationary even though X_t is non-stationary, and equation (2) can, therefore, be thought of as an error correction model. The α coefficients can also, be interpreted as measuring the average speed of adjustment toward the cointegration relationships. The more co-integrating vectors there are, the more constrained or stable the system (i.e. variables do not drift too far apart from one another).

4.1.1 Test for Stationarity

As usually required of all cointegration tests, the variables of interest must first be tested for non-stationarity (i.e. presence of unit roots). This is done by using the simple Dickey-Fuller (DF) and the Augmented Dickey-Fuller (ADF) statistics. The reason for using both statistics is that because the simple DF test is based on the assumption that the series follows a simple first-order auto-regression, and since this is not the case of most economic time series, ADF is applied to take account for any serial correlation by entering lagged values of the dependent variables as explanatory variables. The DF and ADF pseudo t-statistics reported in Table 2 indicate that the null hypothesis of unit root cannot be rejected for the levels of all the series at one percent, with the exception of few cases (MB for all GCC countries and overall balance for Kuwait)⁽³⁾. In contrast, when first differences are used, the null hypothesis of a second unit root (i.e., non-stationarity) is rejected in all cases. Hence, it is concluded that except MB, all series are integrables with order one (denoted $I(1)$).

(3) The non-stationarity of the series implies that the statistical inferences drawn from OLS regression are invalid.

Table 2a. Unit Roots Test (levels)

	M3	CPI	IR	RM	FY	OB	ER
Saudi Arabia	3.03 (0.17)	2.37 (0.38)	-1.62 (-1.53)	1.84 (0.18)	-2.05 (-2.27)	-2.30 (-1.73)	-2.09 (-1.83)
Qatar	4.14 (1.14)		-1.63 (-1.05)	3.75 (0.71)	-2.25 (-1.55)		-1.66 (-1.84)
U.A.E	2.62 (1.80)	1.31 (1.34)	-2.08 (-1.55)	2.42 (1.41)	-0.16 (0.88)		-1.67 (-1.84)
Kuwait	4.59 (.41)	3.25 (2.55)	1.06 (.34)	1.16 (.69)	-2.26 (-1.94)	-4.18* (-2.96)***	-1.10 (.99)
Bahrain	3.61 (1.67)	3.33 (0.55)	-1.45 (-1.36)	1.49 (.99)	-3.21** (-2.36)		-1.67 (-1.84)
Oman	3.92 (1.43)	1.06 (.67)	-0.29 (-.38)	2.29 (.87)	-4.00* (-1.93)	-2.30 (-1.75)	-1.66 (-1.83)

Table 2b. Unit Roots Test (First Difference)

	CPI	IR	RM	FY	OB	ER
Saudi Ara	-.34 (-2.0)**	-5.18* (-5.6)*	-1.62 (-2.4)**	-4.30* (-4.8)*	-6.12* (-4.1)*	-8.83* (-5.7)*
Qatar		-12.08* (-7.53)*	-1.37 (-1.7)***	-6.16* (-3.1)**		-6.76* (-4.72)*
U.A.E	-16.6* (-2.87)	-11.64* (-7.92)*	-4.09* (-2.67)	-3.34** (-2.49)		-6.79* (-4.73)*
Kuwait	-3.88* (-2.3)*	-5.26* (-3.0)**	-2.99** (-1.8)*	-5.42* (-4.5)*	-6.08* (-4.7)*	-6.76* (-4.7)*
Bahrain	1.25 (-2.0)**	-7.25* (-4.95)*	-3.47* (-3.87)*	-5.46* (-4.24)*		-6.79* (-4.7)*
Oman	-3.48* (-2.7)*	-7.91* (-5.4)*	-2.82* (-2.1)**	-8.59* (-4.3)*	-5.22* (-2.5)	-6.78* (-4.8)*

(*) (**) (***) Significant at (1%) (5%) (10%). Numbers in parentheses are ADF statistics.

4.1.2 Test for Cointegration

Since nearly all the series have a unit root in their univariate time series representation, the joint modelling of these series is now considered, and it is tested whether these stochastic trends are independent of each other. A necessary condition to establish convergence in a statistical sense is that the trends for the selected GCC macroeconomic indicators be common.

In order to determine the number of cointegrating vectors (r) (i.e. the number of long run relationships among the six GCC countries' variables) and the number of common stochastic trends, two statistics proposed by Johansen (1988) are computed: the maximum eigenvalue test and the trace test. The first test questions the null hypothesis that $r \leq p$ against the general alternative $r > p$. The second test questions the null hypothesis $r \leq p$ against the alternative $r \leq p + 1$. The cointegration results are shown in Table 3.

Table 3. Johansen's test for cointegration H_0

Series	H_0	Eigenvalue	> Max	Trace
CPI	$r=0^*$	0.989	86.12	212.52
	$r \leq 1^{**}$	0.958	60.06	126.39
	$r \leq 2^{**}$	0.901	43.89	66.34
	$r \leq 3$	0.612	17.97	22.45
	$r \leq 4$	0.209	4.47	4.47
IR	$r=0^{**}$	0.518	35.74	131.76
	$r \leq 1^{**}$	0.455	29.71	96.02
	$r \leq 2^{**}$	0.396	24.69	66.31
	$r \leq 3^{***}$	0.349	21.07	41.62
	$r \leq 4^*$	0.284	16.36	20.55
	$r \leq 5$	0.082	4.18	4.18
RM	$r=0^{**}$	0.977	60.01	139.07
	$r \leq 1^{**}$	0.859	31.39	79.06
	$r \leq 2^*$	0.761	22.93	47.66
	$r \leq 3$	0.656	17.07	24.73
	$r \leq 4$	0.348	6.85	7.67
	$r \leq 5$	0.049	0.81	0.81

Table 3 (cont). Johansen's test for cointegration H_0

Series	H_0	Eigenvalue	> Max	Trace
FY	$r=0^{**}$	0.903	37.33	99.05
	$r\leq 1^{**}$	0.831	28.44	61.72
	$r\leq 2$	0.726	20.73	33.28
	$r\leq 3$	0.392	7.96	12.55
	$r\leq 4$	0.241	4.41	4.59
	$r\leq 5$	0.011	0.18	0.18
ER	$r=0^{**}$	0.765	76.72	194.19
	$r\leq 1^{**}$	0.609	49.89	117.47
	$r\leq 2^{**}$	0.502	36.90	67.58
	$r\leq 3^*$	0.339	21.94	30.68
	$r\leq 4$	0.131	7.42	8.74
OB	$r\leq 5$	0.025	1.32	1.32
	$r=0^{**}$	0.679	19.36	33.78
	$r\leq 1^*$	0.494	11.59	14.41
	$r\leq 2$	0.152	2.83	2.83

* (**) Reject H_0 at 5% (1%)

Interest Rates: The maximum eigenvalue test⁽⁴⁾ cannot reject the null ($H_0: r\leq 5$), thus providing strong evidence in favour of five cointegrating vectors and one common trend. Under the common stochastic trend interpretation, the same stochastic growth components presumably affect all the GCC interest rates, thus implying that there is indeed a long-run equilibrium relationship among interest rates and perhaps one common set of fundamentals is driving them. It is worth mentioning that this finding corroborates what has been previously observed as regards the GCC narrow interest rates convergence.

Exchange Rates: Based on the maximum eigenvalue test the null ($H_0: r\leq 4$) cannot be rejected, thus suggesting the presence of four

(4) The power of the trace test is less than that of the maximum eigenvalue test.

cointegrating vectors and two common stochastic trends. This would imply that the movements of the GCC members' exchange rates are perhaps influenced by two primary factors. The identification of these two factors is an interesting topic that warrants further research. A possible explanation of this result stems from the fact that the GCC members do not maintain a uniform exchange rate arrangement. While Saudi Arabia, Bahrain, Qatar, and the U.A.E. peg their currencies to the SDR with a limited flexibility, Oman and Kuwait do not. Nevertheless, this finding on exchange rate would make it easier for the GCC states to adopt either a simple exchange rate integration (by pegging GCC currencies to SDR and preserving the announced rates among themselves) or a comprehensive exchange rate integration (i.e. creation of Gulf dinar).

Consumer Price Index: Because of data constraints, Qatar has not been included in the estimation. The maximum eigenvalue test cannot reject the null ($H_0: r \leq 3$), thus, implying that there are three cointegrating vectors and two common stochastic trends. The cointegration results seem to suggest that consumer prices in the GCC countries share two common sets of fundamentals. In fact, the early analysis of inflation differentials in section 3, indicates that two subgroups emerge, one (Bahrain, Kuwait) which converges more with Saudi Arabia, and another (Oman and the U.A.E) which rather diverges from it.

Reserve Money: Based on the maximum eigenvalue test the null ($H_0: r \leq 3$) cannot be rejected. Hence, there is evidence for three cointegrating vectors and three common stochastic trends. Since trends are not commonly shared, different underlying factors are therefore affecting reserve money in the GCC members. The cointegration results do not lend support to convergence in seignorage.

Fiscal Deficit: The maximum eigenvalue test which cannot reject the null ($H_0: r \leq 2$), implies the presence of two cointegrating vectors and four common stochastic trends. This also suggests that the implied long run equilibrium relationship is not multivariate. In other words, the behavior of fiscal variables are not driven by a common stochastic trend, and this leads us to conclude that fiscal convergence among the GCC members is far from being achieved. The cointegration results are almost in line with the fiscal picture discussed in section 3 which cast doubt on fiscal convergence.

Overall Balance: Here again, because of data constraints, countries like Qatar, U.A.E. and Bahrain are excluded from the test. The maximum

eigenvalue test on the reduced sample reveals the presence of two cointegrating vectors and one common stochastic trend. Hence, the three overall balance series are closely linked, with perhaps one common factor influencing their behavior.

3.2 Factor Analysis

In an attempt to provide further empirical insights on macroeconomic convergence, another statistical technique is used, namely the factor analysis. This approach intends to detect factors underlying the sets of the selected macroeconomic variables by identifying distinct groupings of variables that are highly correlated with one another. The factor loadings which reveal the extent to which each of the variables contributes to the meaning of each of the factors, are estimated. Variables with high loadings on a factor are the ones that contribute most to the meaning of the factor. From the results reported in the tables below, a number of conclusions are reached.

Money Supply: When factor analysis is applied on MB series a single factor is extracted. The estimated factor loadings indicate that the six MB series assign an almost equal and positive weight to this single factor which presumably, explains nearly 99 percent of the variance. One interpretation might be that there is a common underlying set of fundamentals driving the movement of MB. It is noteworthy to mention that oil revenues, a common feature shared by the GCC members, are an important determinant of both government expenditures and domestic liquidity.

Consumer Price Index: Only one factor is extracted for the six CPI series. However, four of them (Saudi Arabia, Bahrain, Qatar, Kuwait) assign a relatively larger weight on the factor (i.e. 0.95-0.96). This finding is also, in line with both the early analysis of inflation in section 3 and the cointegration results.

Interest Rates: One factor is extracted for the six interest rate series. This means that only one factor accounts for most of the variance in the six interest rate series. With the exception of one series (i.e. Kuwait), which appears with a small and negative factor loading, all the other series assign a large and positive loading (0.94-0.99) on this factor. Like the early analysis, this result also suggests that nearly, all the GCC members share the same pattern in their interest rates movement.

Reserve Money: Although a single factor is extracted, there seems to be some asymmetry in the way this factor is accounting for the variance in the reserve money series. Four series weigh significantly on this factor (i.e. 0.92-0.98) and two other series (Saudi and Kuwait) weigh relatively less (i.e. 0.49-0.66).

Fiscal Deficit: Two factors are extracted from the fiscal deficit series. Saudi Arabia and the U.A.E. assign a positive and large weight to the first factor, while Kuwait and Qatar assign large and respectively positive and negative weights on the second factor. Oman and Bahrain assign a nearly equal weight to the first factor. This indeed suggests that fiscal convergence is not fully evident among the GCC members.

Exchange Rate: Only one factor is extracted for the six exchange rate series. With the exception of Kuwait which assigns a small and negative loading on the factor, all the other GCC members load heavily and positively on this unique factor. Presumably, this factor may reflect the fact that the GCC members' currencies are de facto largely influenced by the U.S. dollar.

Overall Balance: Three factors are extracted for the six overall balance series. The first factor is positively associated with Oman, Qatar, Bahrain and Saudi Arabia, while the second and the third factors are associated more with the U.A.E. and Kuwait.

Table 4. Factor Analysis Results

<i>4.1 Normalized Factor Loadings M3: One Factor</i>	
Saudi	0.9969
Oman	0.9921
U.A.E.	0.9939
Qatar	0.9985
Bahrain	0.9981
Kuwait	0.9960

4.2 Normalized Factor Loadings CPI: One Factor		
Saudi	0.9601	
Oman	0.7886	
U.A.E.	0.6299	
Qatar	0.9527	
Bahrain	0.9618	
Kuwait	0.9518	
4.3 Normalized Factor Loadings IR: One Factor		
Saudi	0.9813	
Oman	0.9581	
U.A.E.	0.9552	
Qatar	0.9428	
Bahrain	0.9915	
Kuwait	-0.2161	
4.4 Normalized Factor Loadings RM: One Factor		
Saudi	0.6645	
Oman	0.9784	
U.A.E.	0.9279	
Qatar	0.9787	
Bahrain	0.9445	
Kuwait	0.4932	
4.5 Normalized Factor Loadings FD: Two Factors		
Factor 1	Factor 2	
Saudi	0.9183	-0.2642
Oman	0.7943	0.1281
U.A.E.	0.9253	0.2367
Qatar	0.5298	0.6636
Bahrain	0.7889	0.0043
Kuwait	0.5982	-0.7282

4.6 Normalized Factor Loadings ER: One Factor			
Saudi	0.9864		
Oman	0.9950		
U.A.E.	0.9966		
Qatar	0.9961		
Bahrain	0.9966		
Kuwait	-0.3059		
4.7 Normalized Factor Loadings OB: Three Factors			
Factor 1	Factor 2	Factor 3	
Saudi	0.6153	0.5264	0.3907
Oman	0.8834	0.1618	-0.2823
U.A.E.	0.3741	0.5458	-0.6448
Qatar	0.7684	-0.3241	0.3128
Bahrain	0.6772	-0.2789	0.3052
Kuwait	0.3482	0.5264	-0.5652

5. Concluding Remarks

The purpose of this paper was to examine macroeconomic convergence among the GCC states in an attempt to establish a base for the proposed monetary integration.

Applying the multivariate cointegration procedure due to Johansen (1988, 1991) we found that in regard to interest rate developments, the GCC states seem to be sharing a single common stochastic trend, which may suggest that narrow monetary convergence is being achieved. This does not exclude the need to set a target for future interest rate developments. The U.A.E. Oman and Qatar which exhibit relatively lower in interest rate can be used as a reference case. For interest rate convergence, interest rate should not exceed these best performing member states by two percent. The exchange rate and the CPI series reveal the existence of two primary sets of fundamentals shaping their behavior, which may indicate a less narrow convergence. In this respect, the suggested target would be an inflation rate not exceeding the average

rate of three best performing countries, that is U.A.E, Oman and Qatar. Perhaps, a close coordination among the GCC central banks to put control over money supply growth is needed to reduce inflation differentials across member states. In contrast, in the area of seignorage and fiscal deficits the GCC states do not seem to share common fundamental characteristics (i.e. at least three common trends are found). They rather exhibit features of fiscal divergence. If the GCC members are to form a monetary union, they should unify the way they finance their budget deficits. Furthermore, if a target is to be defined, they also should maintain a ceiling of three percent of GDP not to be exceeded. In terms of fiscal performance, the U.A.E and Bahrain are the two best reference cases. The cointegration results are consistent with the assessment of facts on macroeconomic performance discussed in section 3.

The factor analysis results are to a large extent in line with the cointegration analysis' findings. With the exception of the fiscal deficit series for which two factors are detected, only one factor is extracted for each of the other sets of economic series (i.e. money supply, interest rate, the CPI and the exchange rate).

The implications of the results are manifold. The empirical evidence seems to suggest that, overall, some of the selected macroeconomic indicators are not drifting too far apart from one another. However, the level of convergence that has been achieved does not seem to be adequate, particularly, in the area of fiscal policy, external balance and to some extent inflation.

Actually, the GCC states have expressed a great concern over their fiscal deficits; and in an attempt to alleviate the fiscal burden, a number of measures on the expenditure side (e.g. a reduction in public expenditures, and increase in prices of some subsidized public services, etc.) have been adopted. However, the situation seems to call for further adjustment and more fiscal discipline. At the GCC level, a serious effort for policy coordination and further convergence is expected in order to speed up the process of monetary unification. One expects to see actual accomplishments and not merely policy statements and declarations of intentions. Substantial effort is to be made in the foreseeable future towards enhancing and upgrading the mechanisms of cooperation and unification.

The GCC members should be more devoted to their long term commitment to union. The already existing arrangements or agreements among the GCC members, whose execution has either been delayed, or suspended, ought to be implemented. Likewise, the GCC institutions that have been created, need to be vested with sufficient prerogatives to perform their tasks and thus, meet their policy objectives; and any legal or institutional impediments to policy coordination and macroeconomic convergence must be phased out.

Overall, one final point is in order. There seems to be an urgent need for an approach to policy coordination and a strategy to set targets and broad guidelines in order to narrow inter-countries disparities and achieve the preconditions for a viable monetary union. In particular, a coordinating institution is needed to assess national policies, define the rules (the convergence criteria: inflation record, no excessive FD, ER fluctuation margins and IR ceilings), identify divergences from these rules, and determine the appropriate corrective measures.

For further research, it would be of interest to explore the issue of fiscal policy coordination and discipline in the context of the GCC, to see how individual member countries cope with fiscal deficits and how this would influence the fiscal/monetary policy mix and thus, the preconditions for monetary integration.

figure 1. Nominal Exchange Rates

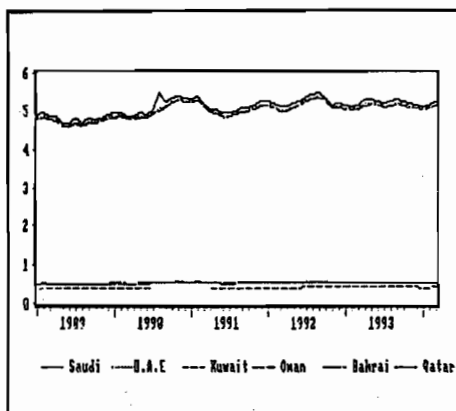


Figure 2. Price Differential (relative to Saudi prices)

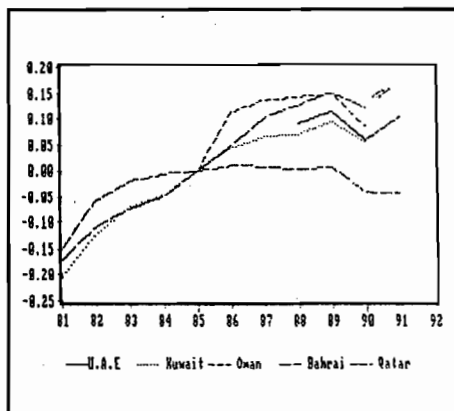


Figure 3. LOG(M3)

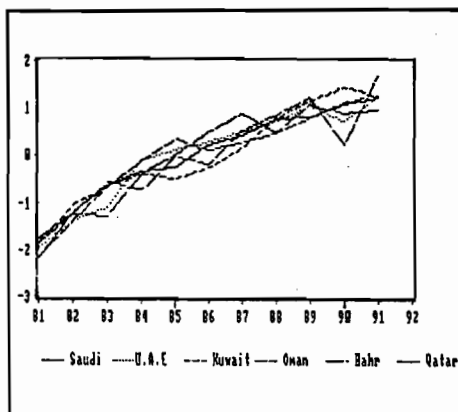


Figure 4. 3Months Gulf Interest Rates

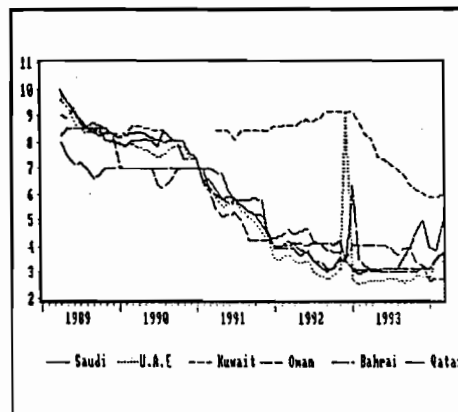


Figure 5. Fiscal Deficit As % of GDP

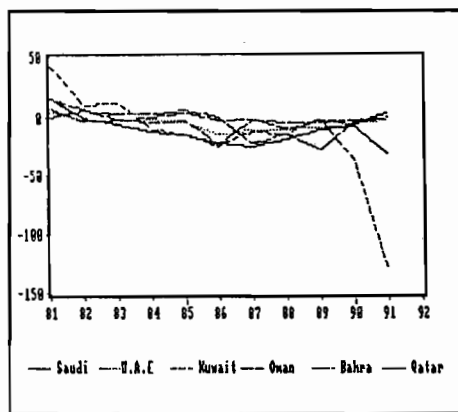


Figure 6. Overall Balance AS % of GDP

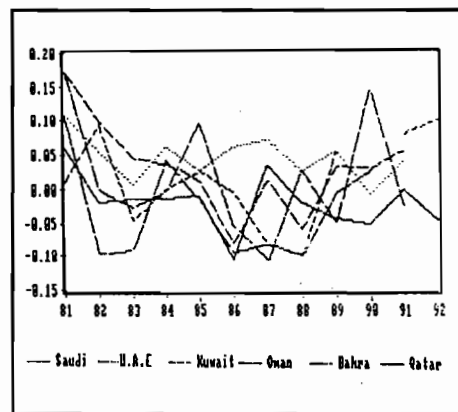
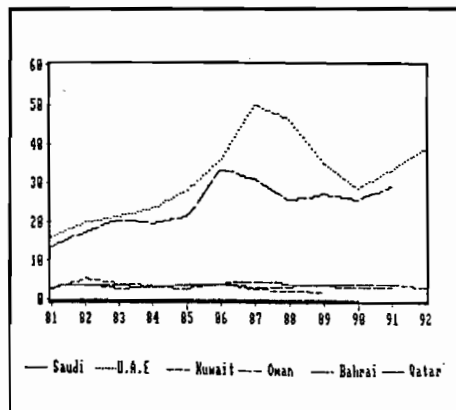


Figure 7. Seignorage (Reserve Money As % off GDP)



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