Review of Monetary Unions criteria and Prospect of the GCC monetary union experience

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مراجعة معايير الاتحادات النقدية واستشراف تجربة الاتحاد النقدي لمجلس التعاون لدول الخليج العربية

المصطفى بنتور، صندوق النقد العربي

ملخص:

تتناول هذه الورقة مستقبل مشروع العملة الموحدة لمجلس التعاون لدول الخليج العربية، وتركز بشكل خاص على أهم السمات الاقتصادية التي تميز دول المجلس، فضلاً عن أهم العوامل الاقتصادية الخارجية التي تؤثر في المصير المشترك لدول المنظومة. من بين دول مجلس التعاون لدول الخليج العربية الست، أعلنت أربعة بلدان عن إنشاء مجلس النقد الخليجي في عام 2010، بينما فضلت سلطنة عمان ودولة الإمارات العربية المتحدة عدم الانضمام حالياً مع إمكانية التحاقهما مستقبلا. نناقش مشروع العملة الموحدة الجديدة لمجلس التعاون لدول الخليج العربية الست، بافتراض أن الاتحاد النقدي سوف يتغلب على الاختلافات من خلال إنشاء العملة الجديدة خاصة مع الحدود الجغرافية المشتركة والتشابه الديموغرافي والثقافي وكذلك تشابه هيكل الإنتاج بين البلدان.

استناداً إلى مراجعة شاملة للأدبيات النظرية والتجريبية حول المناطق النقدية المثلى وفقاً لمجموعة من المعايير الاقتصادية، فإننا نرسم تحليلا لجوانب الاتحاد النقدي لدول مجلس التعاون الخليجي التي يجب تعزيزها على المدى المتوسط والطويل. تسلط هذه المراجعة الأدبية الضوء على العديد من الخلافات حول مجموعة من المعايير التي يجب أن تجتمع في المنطقة النقدية المثلى، فضلاً عن الاختلاف على تقييم الاقتصاديين لمنطقة اليورو باعتبارها تجربة هامة للاتحادات النقدية في التاريخ. كل هذه الخلافات النظرية والتجريبية تشير إلى أنه "لا توجد وصفة واحدة ووحيدة تناسب الكل" في تحديد المناطق النقدية المثلى. ومن هنا، فإن المفاضلة بين مشروع الاتحاد النقدي أو أي نظام سعر صرف آخر بالنسبة لدول الخليج، تعتمد على مدى تجاوز الآثار الجانبية لتقلبات أسعار النفط من خلال التنويع الاقتصادي وتكثيف التجارة البينية وتفادي التضخم المستورد تحت سياسة سعر الصرف المتبعة.

الكلمات المفتاحية: انتقال عناصر الإنتاج، سعر الفائدة للاحتياطي الفدرالي، الصدمات الخارجية، أسعار الأغذية الدولية، أسعار النفط، المنطقة النقدية المثلى.

Review of Monetary Unions criteria and Prospect of the GCC monetary union

El Mostafa Bentour, Arab Monetary Fund.

Abstract:

This paper shed light on the future of the GCC single currency project. It focuses especially on the most important economic properties characterizing the economies of the Gulf Cooperation Council (GCC), as well as, the important foreign economic shocks threatening the common destiny of the GCC countries. Among the six GCC countries, four have announced the establishment of a Gulf Monetary Council in 2010. Oman and United Arab Emirates withdraw from the negotiation process and may join later. We discuss the potential new single currency for the six GCC countries assuming that the monetary union will overcome the differences by the establishment of the new currency especially with shared geographic borders and demographic and cultural similarities as well as production structure resemblances between countries.

Based on a thorough review of a large theoretical and empirical literature on the optimal monetary areas according to a set of economic criteria, we draw an analysis of the aspects of the GCC monetary union that should be enhanced over the medium and long run. This work highlights many controversies and inconsistencies about the set of criteria an optimum currency area should fill as well as a divergence on the economists' assessment of the euro area as an important experience of a monetary union in the history. All these theoretical and empirical controversies indicate that there is "no one size that fits all" for the monetary unions. Hence, the differentiation between the monetary union project and any other exchange rate regime for the Gulf countries depends on their capacity to be insulated from the oil price volatility by the economic diversification and intensification of intra-trade linkages, and the avoidance of imported inflation under the adopted exchange rate policy.

Keywords: Factor Mobility, Federal Funds Rate, Foreign Shocks, International Food Prices, Oil Prices, Optimum Currency Area.

Introduction

The formation of monetary agreements fits into the overall process of regional integration which begins with trade agreements, trade unions, to the full and deep integration involving monetary unions and federalism. The principal difference is that, unlike the trade agreements that set rules at the borders, monetary unions are turned inward in search of harmonizing internal rules of the States. This harmonization is generally hampered by the politics as each State seeks to preserve its sovereignty over some aspects. One criticism of the Optimum Currency Area theory (OCA), originally introduced by Robert Mundell in 1961, is the minimization of the political aspect over the economics. This seems to be revealed in the example of the European Monetary Union (EMU) where the 2008 crisis has revived the debate on the OCA theory. Despite these critics, the OCA initiated by Mundell theory (1961) has so far remained the reference model framing the debate in academic and political circles (Rose, 2000).

For Mundell, the OCA is the region where the factors of production (particularly labor) are mobile inside of it and immobile across its borders. The problem then lies in cutting the region on the basis of this criterion. Labor mobility allows the unemployed of a depressed zone to move to another prosperous, which regulates underemployment in the first and appeases inflation in the second. Mundell's work was followed by other economists' contributions enriching the literature on the OCA. Two extensive periods of researches can be distinguished: The first dated back to 1960, where the most important contributions are due in particular to McKinon (1963) and Kenen (1969). The second period started from 1990 and focuses on the empirical evaluation of the OCA criteria and their endogeneity. Among these researches, those of Bayoumi and Eichengreen (1992), Tavlas (1993) and Frankel and Rose (1996). All these researches revealed some inconsistencies about the optimality criteria of an OCA.

In 1999, Mundell has experienced two events marking the success of its contribution to the OCA theory. The first was his award of the Nobel Prize especially on his contribution to the development of this theory. The second was the adoption of the single currency -which he defended- with a core of 11 European countries forming the

European Monetary Union or the Eurozone (EMU). The latter is an important example of monetary areas in recent history that accompanied the debates of the OCA theory. However, most empirical studies of optimality criteria of the Eurozone showed a slow adjustment in this zone compared to the dollar zone of the United States. This adjustment delay is mainly attributed to the low labor mobility and lack of fiscal integration. These weaknesses were highlighted by the crisis that began in 2008 and gave rise to sharp criticism against the EMU.

The recent developments in the Euro area supported the position of major countries to reject membership in the EMU (Sweden, Britain, Denmark), as this may discourage the formation of other candidates' currency areas, such as Mercosur, ASEAN (de Grauwe, 2016) as well as the Gulf Monetary Union (GMU). The latter is an important project towards a fully integrated economic union between the six Gulf Cooperation Council (GCC) countries. The GCC formed in 1981 has achieved, since then, a custom union and assured free movement of capital and national labor. Furthermore, the population shares the same cultural aspects and language. Economies also enjoy, to some extent, the same production similarities and dependence to foreign labor markets. These properties should ease the differences between countries and contribute to the success towards a complete economic and monetary integration.

This paper provides an update on the major theoretical and empirical developments in the OCA. The concept of optimal currency area "under Mundell" is explained as well as the succeeding researches around the OCA theory are presented in the first section. It especially shed light on the controversies of the first authors and the latest researches aspiring to renew this theory. A literature assessment of the optimality of the European Monetary Area has been also summarized. The second section displays an empirical assessment of the impact of the main foreign shocks on the six GCC countries as a potential monetary union.

1. Literature Review on the Optimum Currency Areas

1.1. The OCA by Mundell (1961): The vital role of the labor mobility

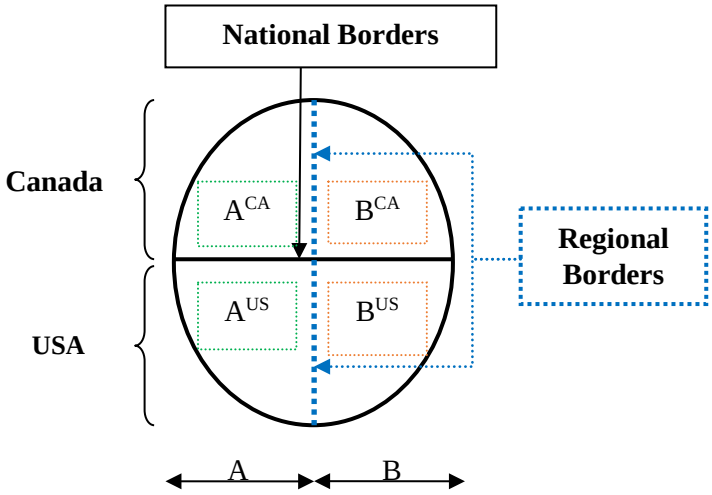
Mundell defines the currency area as a space within which the exchange rate is fixed. The optimality of this area depends on the delimitation of the regional area, as opposed to the national area, appropriate to it. Determining this domain based on a set of criteria especially the factor mobility within the regional area and their immobility across national borders. To determine the properties of the OCA, Mundell (1961) theory was particularly devoted to the comparison of costs and benefits of imbalances adjustment in the regional area, characterized by the fixed exchange rate, compared to the adjustments in the national area with flexible exchange rates.

To illustrate these adjustment differences, Mundell uses an example of an area of two entities A and B and suppose the Keynesian framework rigidity of prices and wages in the short term. He also assumes that the authorities have objectives to fight inflation and promoting employment and consider external accounts initially balanced. Any shift in demand from B to A causes a deficit and unemployment in B and a surplus and inflation in A. The adjustment to the shock depends on the nature of the regions A and B and their geographical areas:

• If A and B are parts of a closed economy with a single currency, the authority's response to the unemployment in region B is to increase the money supply, which will push more inflation pressures in A. The adjustment in a region by the money supply further alters the other region. Thus, labor mobility is necessary to adjust imbalances. If A and B were countries each with its own currency, the burden of adjustment to bear by a country, to ease unemployment depends on the other country cooperation and tolerance for inflation on its territory. With a flexible exchange rates, the adjustment is performed by the variation thereof.

• If, however, A and B are areas extending beyond national boundaries, the flexible exchange rate is so inefficient when it comes to correcting imbalances between regions where regional areas do not match the national borders. To better spread this point, Mundell

assumed the example of two countries; Canada and the United States, each with a national currency fluctuating relative to the other. The regions A and B each extend over both countries (diagram below). Any demand disruption will have a similar impact as the one described above for the two regions. Since each country contains parts of both regions A and B, no Central Bank of the two countries can correct the imbalances on a depressed area without altering the second part of the excess region on the same national domain. The national money supply cannot then adjust unemployment in the region. The flexible exchange rate also can correct national balances but not regional ones.



Source: Author's construction

By this example, Mundell shows that the argument for flexible exchange rates is more appropriate as the currency area coincides with the area defined by the internal factor mobility and external immobility; which means the national borders coincides with regional borders. Indeed, if the labor factor B can move to A, automatic rebalancing will occur at no additional cost for both economies. Unemployment appearing in B due to the reduced level of economic activity pushes the unemployed in this region to move to A. The supply of labor in B decrease and avoids wages from falling further. The area A experiences the opposite situation. With this movement of labor between the two regions, the respective levels of demand become consistent with the respective offers in the two countries A and B.

Given the role of labor mobility in the region, Mundell wishes that national currencies would be implemented according to regional borders. However, he acknowledged that this distribution is utopian because it requires political will to abandon monetary sovereignty to the region. Indeed, the regional area is determined based on labor mobility as a pure economic criterion, while the national currency area is a form of expression of sovereignty, which makes it difficult to abandon national currencies in favor of regional currencies. The proposed regionalization of currencies is rather a pretext for the rejection of a flexible exchange rate than its feasibility (Mundell, 1997). In addition to the problem of sovereignty, dividing areas according to the factor mobility increases the number of zones and therefore transaction costs related to the conversion of different currencies to each other. Furthermore, this division reduces the size of areas and therefore, the risk of speculation against the currency.

To be able to convince for a need for forming monetary unions, Mundell has adopted a progressive approach against the flexible exchange regime by listing difficulties and costs associated with adjustments by fluctuating national currency, particularly if regional and national borders interfere.

If Mundell based his theory on the importance of the mobility of factors as an essential criterion for the optimality, its contribution has initiated a series of works enriching the OCA theory. Most of these works complete and refine the original perception of Mundell (Rose, 2000), despite some controversies.

1.2. The early contributions to the OCA and their inconsistencies

At the beginning of Mundell theory, researches on the OCA have increased, with the most notable are those of McKinnon (1963) and Kenen (1969). The pace of research has slowed to some extent from the 70’s. This coincided with the end of the era of the Breton Woods system in 1971 and the move to floating exchange rates in 1973 (Mundell, 1997). But it seems that this movement is not the cause of the slowdown, but rather was the results of some inconsistencies that have been revealed by some works about the optimality criteria (Tavlas, 2009).

The OCA approach, due to the work of Mundell (1961), McKinnon (1963) and Kenen (1969), focuses on the benefits and costs of a monetary union. The establishment of a single currency is linked to the condition that the participating countries give low-cost use of exchange rates and national monetary policies as adjustment variables. The path of adjustment is provided in a system of fixed exchange rates by the high degree of factors' mobility. This level is even higher than the countries enjoy other properties for smoothening asymmetric shocks such as; fiscal and financial integration, a high degree of openness and a strong product diversification. However, the minimum differences may emerge as to the choice of the OCA criteria.

The contribution of McKinnon (1963) to the OCA theory stands for two criteria; the degree of openness, apprehended by the ratio of tradable to non-tradable goods, and trade integration criteria. The adjustments are made with the interaction of domestic prices (prices of non-tradable goods) with foreign prices (tradable goods). When the openness is high (especially for small countries), the weight of tradable to the non-tradable goods is important. Home prices will be so heavily influenced by foreign prices. The flexible exchange rate becomes ineffective in the adjustment of the external balance and can even affect internal stability.

As for the contribution of Kenen (1969), the optimality is measured by criteria that seem, according to his view, more important than labor mobility, namely; fiscal integration, productions structure similarities and product diversification (Tavlas, 2009). A strong fiscal integration makes it possible to reduce the effect of asymmetric shocks through fiscal transfers from the country with full employment to the country of underemployment. In addition, countries with close and similar production structure experience similar shocks. Finally, diversification can promote labor mobility and mitigate the impact of asymmetric shocks.

The contributions of these authors revealed some inconsistencies on the OCA criteria. Therefore, if McKinnon (1963) argues that the flexible exchange rate is not effective for small open economies (due to high ratio of tradable to non-tradable goods), Kenen (1969) concludes that a sizable diversified economy with a reduced external sector

should set its parity. This means implicitly small countries must adopt a flexible regime contrary to the conclusion of McKinnon (1963). On this idea, Mundell (1973) points out the importance of diversification in international risk sharing. Furthermore, Kenen (1969) seems to disagree with Mundell (1961) on the labor mobility criterion. Indeed, according to Kenen (1969), the labor mobility could be corrected by national and regional tax policies and concluded that the area of fiscal policy should coincide with the monetary area.

Despite these previous contributions disagree on some OCA criteria, other contributions supported and completed Mundell (1961)'s theory. Thus, the first point raised by McKinnon, which fill up factors mobility, is the inter-industry mobility. Indeed, Mundell seems considering only geographic mobility between regions. However, McKinnon believes that inter-sectoral mobility can plays the same role if factors are to move from a depressed sector to develop highly demanded goods in another sector within the same region and without need to cross regional borders. Accordingly, any policy that aims to dispense with the inter-regional immobility may be optimal (McKinnon, 1963). Moreover, Mundell (1961) suggests factor mobility as a criterion but his reasoning seems to imply labor mobility. Likewise, Ingram (1962) complete this by referring to the criterion of financial integration and the appropriate role of capital mobility in the adjustment process without need for adjustment through the exchange rate (Mongelli, 2002).

If the first contributions of the 1960’s has put the cornerstone of the OCA, other significant works emerged during the 70’s and 80’s. The most important are the work of Corden (1972) and Ishiama (1975) which emphasized the criterion of the prices and wages flexibility and warn against inflation differences and preferences in establishing an OCA. These contributions have made a link to the work of the 90’s addressing critics to the standard theory of Mundell and trying to establish a new OCA theory.

1.3 Critics and empirical assessments of the OCA theory

In the early 90s, the subject of OCA has reemerged, in parallel to the signing of the Maastricht Treaty in 1992 for the implementation of the European Monetary Union. Researches of this period was marked by a desire to improve the approach of the previous authors behind the OCA theory. Consequently, Tavlas (1993) proposed a synthesis of the

criteria he called "the new OCA theory"; a summary of a set of criteria of the standard theory to which he adds other criteria such as the convergence of inflation levels, the political will, the flexibility of prices and wages and the variability of the real exchange rate.

One of the most severe critics of the OCA theory is that it neglects the political aspect, yet, seen by opponents as an essential criterion. This is left to the differing authors' subjectivities, among those who recommend a political union before monetary union and those who do not see any preconditions or that this union could be delayed for the long term. Furthermore, the standard theory does not seem to treat a particular case of irrevocable exchange rate although it was emerged from a debate between fixed and flexible exchange rates (Priewe, 2007). Intermediate solutions of monetary zones (Dollarization, Currency-Board, etc. ...) could be optimal. In addition, the advanced arguments in the standard theory is based on two things: the first is the Keynesian framework of rigidities in prices and wages, at least in the short term, that the work of the second generation reject considering even the flexible prices and wages is an optimality criterion replacing factor mobility. The second is it considers demand shocks and neglects supply shocks, that may result from the institutional and policy changes.

Priewe (2007) also criticizes the theory for not considering currency area between countries of different levels of development. Indeed, the Kenen (1969) criteria of "similarity in production and diversification structures" is interpreted as if levels of developments are close. He also criticized omitting the role of institutions and national policies in the generation of strong asymmetric measures as far as the State is strengthened. To be immune against such shocks implies harmonization of political institutions and the convergence towards a united federal state. Siroën (2004) also criticized the OCA theory to underestimate the role of the single currency as a public good for better international negotiation and other benefits that the national currency does not permit.

Despite the lack of consensus about theoretical approaches for some criteria of the OCA, empirical researches of the 90s around these criteria seem to divert the theoretical controversies to the measurement problems. Mundell himself says the optimality of the

problem comes down in practice to a question of measure (Mundell, 1961; pp. 662). Several studies have been produced, including; Bayoumi and Eichengreen (1992) examining the asymmetry of shocks by breaking the supply and demand shocks using VAR models. This decomposition allowed them to calculate, for each type of shock, correlations between countries and a country supposed to be the anchor country (Germany for 12 European countries and the Mid-West region for eight US regions). Other studies have tested labor mobility and fiscal and trade integration applied to the EMU to judge its optimality.

Other works include Frankel and Rose (1996), introduced the hypothesis of endogeneity of optimum currency areas; optimality criteria can be met after the creation of the monetary union although they were not met before the union. Thus, the ex-ante evaluation based on historical data and ignoring the endogeneity issue, can lead to the preliminary rejection of the monetary union. Krugman (1991) and Krugman and Obstfeld (2015) pointed out that the specialization phenomenon can be stronger and generator of asymmetric shocks. Thus, factor mobility is essential as a condition of an OCA. For Frankel and Rose (1996), the strong trade links increase the symmetry of economic cycles. Both authors pointed out that even in the presence of specialization phenomenon, the result of all shocks is in favor of intra-industry and common demand shocks exchanges. This reinforces the symmetry of the cycles and reversing shocks to smooth due to specialization. The idea by the two authors yielded convincing results.

1.4. The European Monetary Union Optimality: Economists' Views

The choice of the EMU is justified by the fact that this is the largest monetary union in history (Rose, 2006) and for which implementation process accompanied the development of the OCA theory. During the stages of this process, major political and economic events have led to the conclusion of the monetary integration. The political events are reflected in the desire to build a strong, unified Europe after being devastated by the World War (De Grauwe, 2016), while economic events stand for the promotion of trade, the instability of the international monetary system linked to the dollar but also the will to break away from the hegemony of the dollar (Krugman, 2015). This section is to

briefly review important studies assessing the optimality of the Euro zone. Several criteria have been tested, among them; factor mobility, trade, shocks asymmetry, and fiscal integration.

For labor mobility, it is judged to be weak in the Eurozone compared to the United States before the introduction of the single currency (De Grauwe, 1998; Fatas, 1997). Cultural, linguistic and institutional barriers hamper migratory mobility within the Euro zone. Considering this fact, some initiatives have been implemented, to cite; coordination of social security systems, recognition of diplomas and qualifications, language learning and the creation of European employment agency (Crush et al. 2011). Despite these efforts, recent studies (Krugman et al 2015; De Grauwe, 2016) still point to the slow adjustment of labor mobility. According to L'Angevin (2007), the adjustment to shocks in Europe is driven more by changes in worker participation rates than by labor mobility. The response of the latter to asymmetric shocks is three times higher in the US than in the Eurozone. The countries of a monetary zone are constrained by the loss of their monetary policies ceded to a supranational authority (Fleming-Mundell Trilemma), only budgetary policies are at their disposal. In times of crises, these countries are also found between the effects of crises such as unemployment and limited budgetary resources to act. Labor mobility is thus a larger adjustment mechanism of under-employment that should be promoted.

On the contrary, capital mobility seems less worrying in the Eurozone. Only in a fixed exchange rate, this can lead to speculative attacks leading to liquidity crises especially when macroeconomic fundamentals are poor. This issue is serious in a system of irrevocably fixed exchange regime where countries lack the lender of the last resort. This was apparent in the 2008 crisis when the shift of capital flows from the Euro zone peripheral countries to their countries of origin have caused enormous damage.

For the criterion of trade integration, trade will increase following the reduction of transaction costs and the supposed endogeneity of the area should be strengthened. However, while some studies have shown a significant growth of trade after the adoption of the single currency, these results remain insufficient according to other economists' view. Some authors believe that trade should increase following a single currency by 30%

to 90% and other even expect a tripling of intra-area trade (Rose, 2006). However, the momentum of intra-euro trade due to creative effects is estimated to 9% (Baldwin, 2006). The differences in the effects assessment results are likely the result of differences in estimation methods (Glick and Rose, 2015). The lack of trade integration could be attributed, among others, to the work of the phenomenon of specialization and asymmetric shocks absorbing the flow of intra-area trade, contrary to the hypothesis of endogeneity.

For asymmetric shocks, Bayoumi and Echengreen (1992) found that these are low in twelve European countries compared to American areas but remain similar to that of US regions for a core of five countries (Belgium, Denmark, Country- Netherlands, France, Luxembourg) anchored to Germany. Mundell (1997) has encouraged more the union of countries in this area and remained cautious about peripheral countries such as Portugal, Spain and Greece. His past caution is recently endorsed, with the crisis of 2008, between the core and the periphery.

One of the strongest criticisms of the eurozone is a weak fiscal integration among its members. Indeed, the European federal budget does not exceed 1% of GDP (De Grauwe, 2010a). In the US and Canada, the federal budget accounts for 25% and 30% of GDP respectively (the Dehesa, 2012). The Stability and Growth Pact posing budgetary discipline in the EMU has been criticized for its restrictive rules not taking into account the characteristics of each country (Fatas and Mihov, 2003; De Grauwe, 2010b).

To sum up, almost none of the criteria is fully satisfied in the Eurozone compared to the US taken as benchmark. The most satisfied criterion; the mobility of the financial capital, has a dangerous ripple effect in times of crisis. The 2008 crisis that has strongly shaken the eurozone ignited criticisms of the single currency. For example, Krugman (2013) was very skeptical to the point he described the crisis as "the revenge of the OCA" while (Feldstein, 2012) calls the Euro a failure project. Discussions were open questioning the results measured in terms of convergence of prices (interest rates, inflation rates and unemployment) in the Eurozone before the crisis (Baldwin and Giavazzi, 2015). Although the EMU was accompanied by the building of some supranational entities, most economists strongly recommend the transition to a fiscal federalism like the US (De Grauwe 2010a;

Way, 2011). To achieve this, the political union is a prerequisite for the completion of a sustainable currency area in the long term (De Grauwe, 2016), otherwise it would be hard to convince markets of the irreversible fixed parity (Ingram, 1973).

2. The GCC Monetary Union

Among the six GCC countries, four have announced the establishment of a Gulf Monetary Council in 2010. Oman and United Arab Emirates withdraw from the negotiation process and may join later. We discuss the potential expected effects of the new single currency on the six GCC countries assuming that the monetary union will overcome the differences by the establishment of the new currency especially with shared geographic borders and demographic and cultural similarities as well as production structure resemblances between countries.

2.1. Previous Literature on the GCC Monetary Union

Some papers have recently tried to study the convergence criteria of the expected GCC monetary union (Laabas and Limam, 2002; Jadresic, 2002; Abu-Bader and Abu-Qarn, 2006; Razzak, 2009, Darrat and Al-Shamsi, 2005; Hebous, 2006)[1]. The result is that most of these papers rejected the monetary union according particularly to the criteria of divergence in inflation rates and policies, while some of them argued that the monetary union, though not optimal in ex-ante, could be enhanced in ex-post especially by increasing intra-trade linkages. However, few others contrasting the previous conclusion by revealing convergence in inflation rates, growth rates and policies (Darrat and Al-Shamsi, 2005; Hebous, 2006) and reached the conclusion that the GCC countries are potentially able to establish a monetary union. Razzak (2009) used a small model for the GCC countries to conclude that there is no asymmetry.

However, most of the established methodologies in the previous literature about the GCC monetary union stick to the convergence criteria without reflecting well, the fundamental characteristics of the GCC region. Hence, not completely shed light on the expected benefits and costs surrounding such a monetary union. One of the examples is

[1] See AlKholifey and Alreshan (2010) for an overview of the results of these papers.

labor mobility, considered as the major adjustment variable between countries according to Mundell (1961). The dichotomy of the labor market between nationals and foreigners, with the dominance of the latter in general, rend difficult to invoke the adjustment by the labor mobility criterion, especially in the short to medium run with the current labor facts.

The second and most important characteristics is the inflation sources in the GCC countries. We are all aware that the currency peg to the US dollar makes Monetary Authorities (with free movement of capital) first objective to target external prices (exchange rate) and not domestic inflation (the Impossible Trinity). Consequently, the domestic inflation accumulates due mainly to an imported inflation as results of many factors such as, dollar weakening, oil price hikes, food and agricultural commodity inflation (as the GCC countries import almost their needs in foods) as well as decoupling from US business cycle[2]. For this, our approach differs from the previous researches in concentrating the analysis to the foreign shocks that affects the GCC countries, namely: the oil price inflation, the international food inflation and the US monetary policy represented by the changes in the Federal Funds Rate.

As the monetary union is an elaborated form of exchange rate, the important question is whether the current exchange rate regime; the peg to the US dollar[3], is suitable and ensure financial and economic stability to countries, better off than any other regime, precisely the monetary union or also the flexible exchange rate for each single country.

In these regards, Bentour and Razzak (2010) simulated a framework in which GCC countries, especially Qatar and UAE, could avoid the imported inflationary pressures - resulting from shift idiosyncratic economic cycles between the GCC countries and the US- have had adopted a targeting inflation framework. Economic and social benefits and costs are not easy to quantify. Some tradeoffs are even qualitative, and their impact is non-measurable or nearly impossible to assess as it involves many non-economic aspects

[2] Especially, in 2010-2013, the United States was still lowering its policy interest rate in response to recession and GCC consequently follow while they experience relatively high inflation rates especially in UAE, Oman and KSA.

[3] All the GCC countries peg their currencies to the US dollar except Kuwait which started to peg to an undeclared basket of currencies since 2007.

(political as example). For example, the power of negotiation as a group towards the single country view.

2.2. The GCC monetary union and the OCA criteria

According to the previous section discussing the OCA criteria, we draw in table (1) the major criteria that are supposed completed even before the establishment of the monetary union in the six GCC countries. The comparison with the Euro and US zones shows the major areas that should be enhanced either by authorities like labor mobility, the fiscal integration or by the endogeneity of the monetary union itself such as diversification.

Table 1. Comparison of the GCC countries to the US and Euro Zones based on OCA criteria

Criterion	United Sates	Euro zone	GCC countries
Labor mobility	Full mobility	Insufficient	Nationals only
Capital Mobility	Free	Free	Free
Diversification	Yes	Yes	Relatively weak
Production Similarities	No	No	Yes
Fiscal Integration	Full	No	No
Federal Budget	Yes (25-30% of GDP)	Only 1% of GDP	No
Inflation and growth convergence	Yes	Yes	Yes, to some extent
Common Culture and language	Yes	No	Yes

In what follows, table (2) provides a "SWOT" analysis for the GCC monetary union. We summarize the strengths that could work in favor of the monetary integration such as, the free mobility of the nationals and capital, the similarities of productions and particularly the culture and language similarities. In contrast, the weaknesses reside in foreign labor immobility, oil dependency and relatively weak intra-trade. The threats for countries separately are the major shocks that come from oil and food prices as well as the US. monetary policy as an anchor. The opportunities to benefit from a monetary union are many such as; the empowerment of the economic bargaining of the group, the diversification, the stability of the currency, etc.

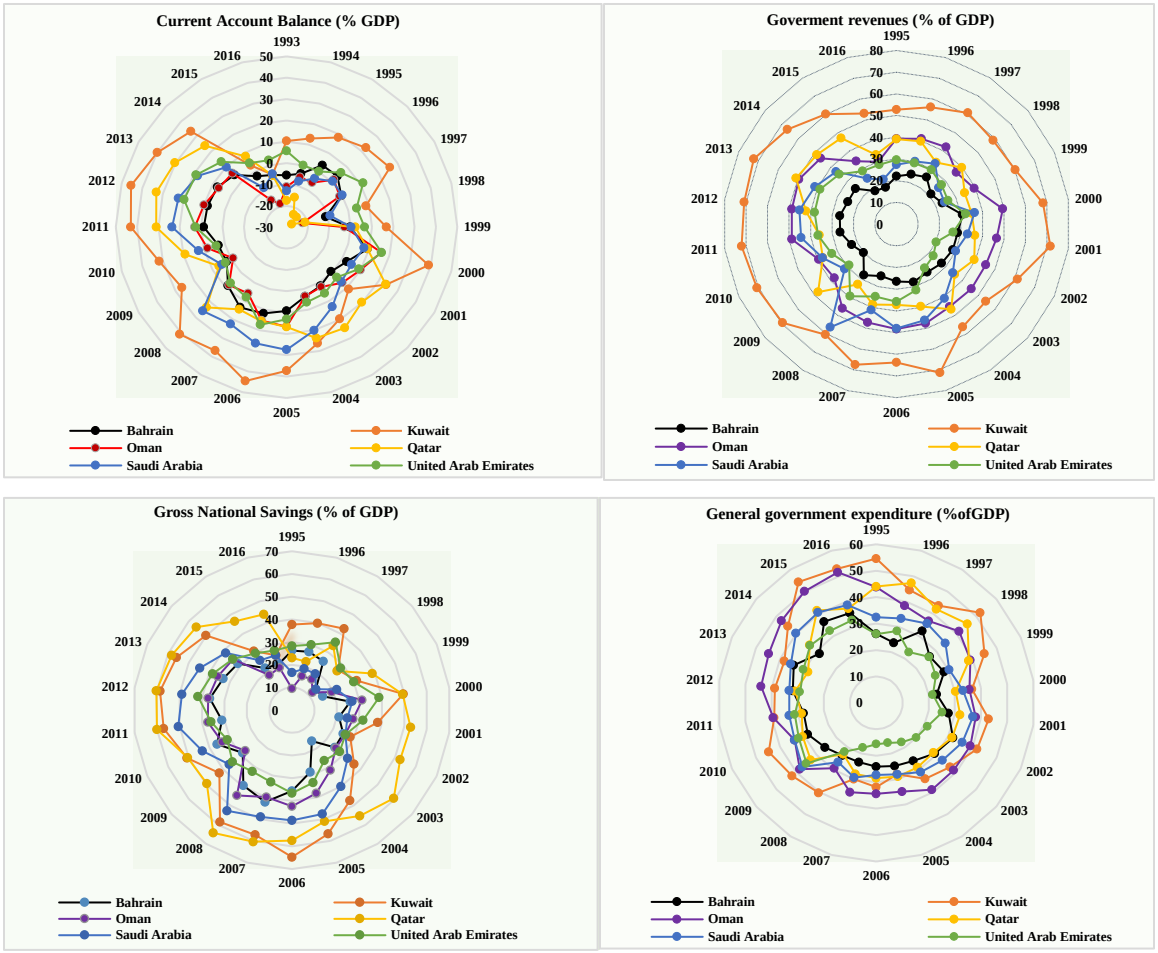
Table 2. SWOT analysis for the GCC Monetary Union.

Strengths in favor of a monetary union	***Weaknesses affecting a monetary union***
Free national population mobility	Foreign labor immobility
Free movement of capital	Foreign Labor dependency
Productions structure similarities	Fuel sector concentration
Cultural and language similarities	Weak intra-trade volume
Opportunities *from a Monetary Union*	***Threats*** *for single countries*
Economic bargaining power	Oil and food prices volatility
Smoothening foreign shocks	Foreign shocks from major trade partners
Increasing intra-trade linkages	Sustainability of the US dollar as a peg
Economic stability	Imported inflation
Avoiding transaction costs	Phase shift between GCC countries and US business cycle
Diversifying economies	
Reducing Currency speculative attacks	

2.3. Statistical Preliminary Analysis

The preliminary data investigation shows, with some differences, that all the six GCC countries have mainly common shocks associated to their similarities in terms of economic structures. The following panel of figures for four selected variables representing the Government expenditures and revenues, the external balance and the national saving, are provided in forms of "spider charts" to better visualize the fluctuations of such indicators over a cycle of the past two decades. There seems to be a general convergence in terms of shocks especially in time of international economic crises reflected particularly in the external position. However, for other aggregates, there may be some resilience or delayed effects of such crises between countries which reflects some changes in level of diversification and policy responses.

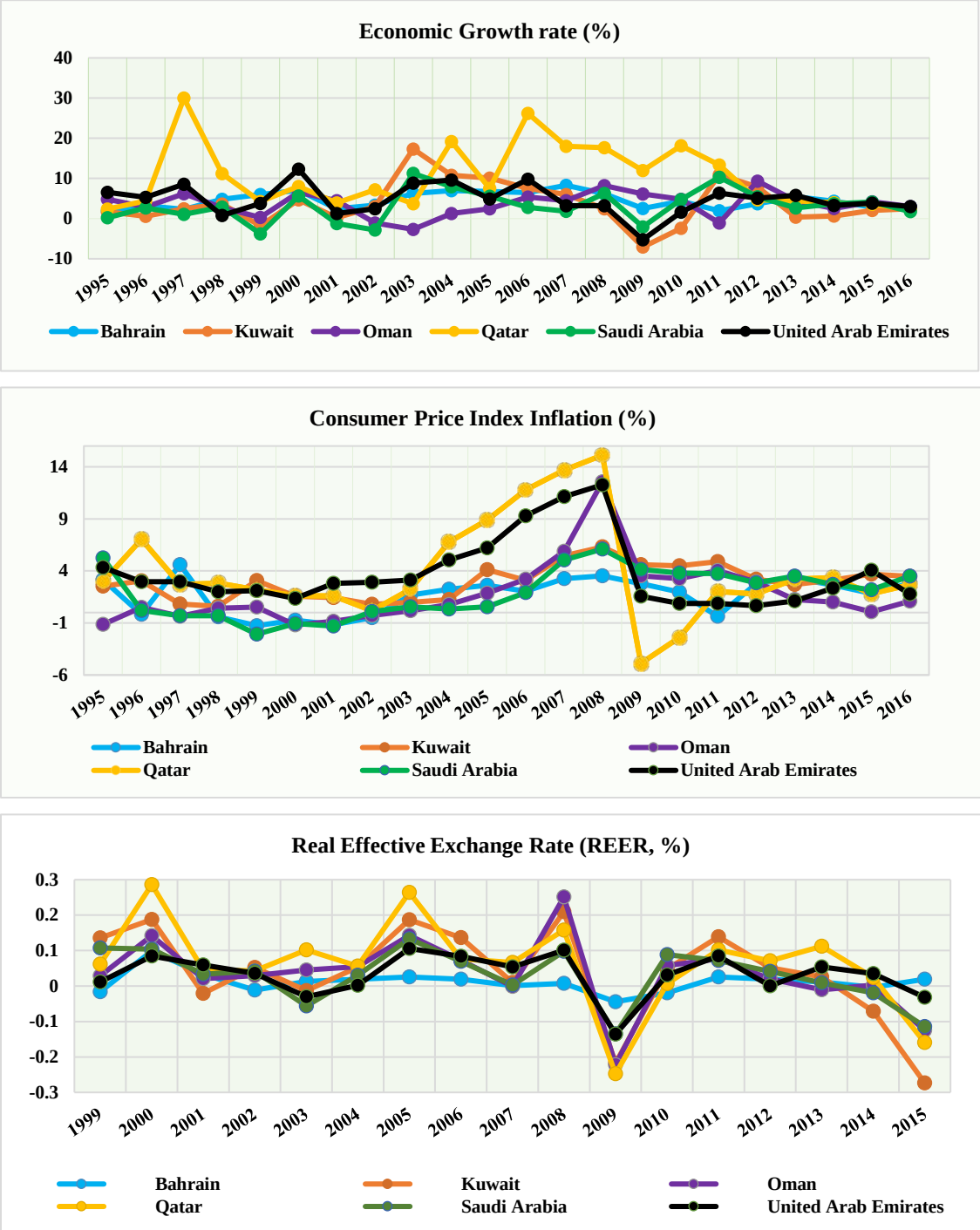
Figure 1. Evolution of selected macroeconomic indicators of the GCC economies



Sources: Constructed from AMF data and IMF WEO Database, October 2017.

Globally, the criterion assessing convergence in economic growth and prices seems to be shared with some disparities in scale between countries. This is reflected in the trend of the economic growth, consumer price inflation and real effective exchange rates (Figure 2). Scale disparities come from Qatar in the growth rate, Qatar and United Arab Emirates in the level of inflationary pressures and Bahrain is distinct in the relative stability of its real effective exchange rate.

Figure 2. Evolution of Economic Growth, Inflation and REE rates in the GCC economies



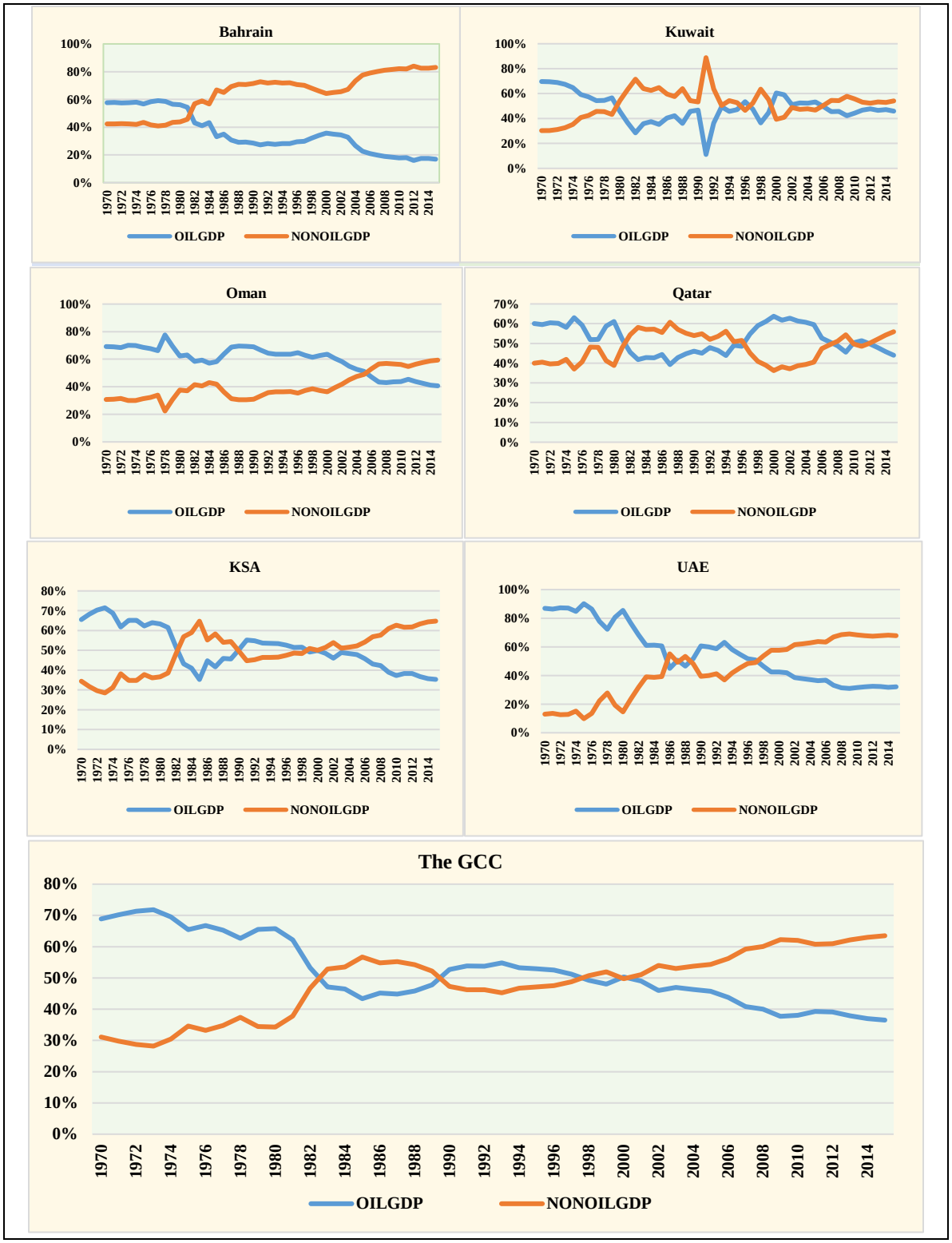
Sources: Constructed from AMF data and IMF WEO Database, October 2017.

The previous common fluctuations are mainly driven by the sectoral developments in these economies. All the GCC countries are considered over decades to be heavy producers and net exporters of oil and gas which contribute by important shares to the government revenues. The following panel of graphs (Figure 3) provide, over the period 1970-2015, the shares of oil and non-oil GDP in the six Gulf countries and the corresponding shares once aggregated as a GCC group.

We notice however some differences between countries regarding the importance of oil to non-oil GDP. In Bahrain, the oil GDP share is overcome by non-oil share starting early 1980's, where the oil and non-oil GDP shares stand currently around 20% and 80% respectively. Two decades later (around 1998), the UAE inverted the trend of the oil GDP dominance and stands now for approximately 30% of oil share only while it was around 80 to 85% in the first decade (1970-1980). Saudi Arabia and Oman joined the track later in around 2005, while Kuwait and Qatar still lacking clear decoupling from energy prices impacts. All these developments may reflect, to some extent, the level and the processes of diversifying other sectors in these economies.

Despite the noticeable efforts to diversify the economies, the GCC countries still depend on the foreign labor which is regulated by national legislatives and bilateral agreements between the GCC countries and the workers' home countries. Foreign labor is slightly varying depending on years and is about half the total population in Bahrain, 2/3 in Kuwait, around 1/3 in Oman and Saudi Arabia, and around 4/5 in United Arab Emirates and 9/10 in Qatar. Furthermore, foreign workers are not allowed to freely move between the GCC countries, thus abolishing the first criterion of free labor movement in the OCA criteria of Mundell (1961). Consequently, the labor mobility should be enhanced not by the flourishing of others economic sectors following many determined agenda policies of which, modernizing, diversifying, and digitalizing the economies, but rather by the efforts of developing and qualifying local human resources to substitute the foreign labor.

Figure 3. Oil GDP and non-Oil GDP shares in the GCC countries



Source: calculated from UNCTADStat database.

2.4. Methodology

In this study, we assess the asymmetric shocks affecting the GCC countries as a group and the shocks on the country-specific basis. Our aim is to evaluate the shocks destabilizing single countries and the expected destabilizing shocks on the GCC as a group forming a monetary union.

The technical approach we used to assess the foreign shocks to the GCC economies is a Vector Auto Regressive (VAR) model augmented with foreign variables sources of shocks. The VAR approach was developed by Sims as an alternative to econometric modeling based on the estimation of structural equations which have been subject to much criticism (Lucas, 1976 and Sims, 1980). The development of the econometric softwares has made easier their implementation and reinforced their use. Furthermore, compared to big macroeconomic models, VAR models can quickly integrate new information and can promptly be re-estimated.

Standard VAR models in their reduced form are defined such as k variables of a vector Y supposed to well describe the dynamic behavior of a sector or subsector of the economy. Each variable of the vector is linearly dependent variable to its past and the past of the other variables of the Y vector. The VAR representation can also integrate a vector of exogenous variables or foreign variables assessed to be the important source shaking the stability of the domestic economies, which we call hereafter VARX; where X is to mention the foreign variables. A formal Simplified representation of such models is described below:

$$Y_t = C + \sum_{j=1}^{p} A_j Y_{t-j} + BX_t + \varepsilon_t$$

Where Y_t, C and ε_t are $k \times 1$ vectors of respectively endogenous variables, constant terms and error terms. A_j is a $k \times k$ matrix of coefficients to be estimated for every $j = 1,..., p$. Where p is the order lag of the VAR. B is the vector column of parameters associated with the vector of the exogenous variables X. Errors ε_t can be correlated to

current values but are uncorrelated with their past values and are uncorrelated with all other variables in the right-hand side of the VARX system. Since only lagged values of the endogenous variables appear on the right side of each equation, there is no simultaneity issue, and Ordinary Least Square (OLS) is potentially an appropriate estimation method.

2.5. Results

The variables involved in a VARX model must have temporal interdependencies (causality linkages). These properties are usually tested by the most used causality test of Granger (1969). Furthermore, the system VARX must be stable which requires all the endogenous variables to be stationary. The stationary properties are checked by the most used tests of Dickey-Fuller and Phillips-Peron and cointegration method to test the stability of the long run relationship. Finally, the number of lags is obtained by tests of information criteria such as Akaike Information Criterion (AIC) and Schwartz Criterion (SC)[4].

In this empirical exercise, I focused on the major foreign shocks undermining the economic stability of the GCC countries; namely, international oil prices[5], international food commodity prices and the United States monetary policy represented by the Federal Funds Rate(FFR). The domestic variables are essentially the Non-Oil GDP and the domestic consumer price index for the GCC countries. All these variables have been first differentiated and introduced as domestic inflation and Non-Oil GDP growth rate for domestic variables. For foreign variables, we considered international food inflation (FINF) measured by changes in the international commodity food price index, oil inflation (OINF) assessed by international oil prices growth rate and Federal Funds Rate variation (FFR) representing the United States monetary policy changes. The historical data of these variables are from AMF and UNCTAD database for domestic inflation and Non-Oil GDP (calculated as the sum of the values added except fuels and mining sectors), the Federal Reserve website for the FFR, the UNCTAD for food inflation and the OAPEC for the Oil

[4] The econometric software E-Views offers a test to select the minimum lag length based on five criteria that are: FPE for Final Predictor Error, AIC for Akaike Information Criterion, SC for Schwarz Information Criterion, HQ for Hannan-Quinn and LR for sequential modified Log Likelihood Ratio test. For more lecture on the subject refer to Zucchini (2000).

[5] Crude petroleum, average of UK Brent (light), Dubai (medium) and Texas (heavy), equally weighted ($/barrel).

prices. Furthermore, we judge that these shocks are rather for short and medium term than the structural shocks coming from reforming the economies and long term industrial policies. For this reason, we do not study the long run relationships (cointegration)[6].

The weaknesses of the VAR methodology are their need for larger time series for a growing number of variables and or the presence of many lags. For our case, this is not a major issue since we only accepted first lag as revealed by the lag order selection criteria for all the countries, as well as a sufficiently longer time series for 5 de-trended variables over the period 1980-2015. Table 3 (Appendix 1) shows that all the considered models, in first differences, accept the first lag especially for the Schwartz Criterion (SC), while table 4 (Appendix 1) presents the results for the Granger causality.

The figures 4 to 10, (Appendix 2), present the responses of the domestic variables (Non-Oil GDP and domestic inflation) to the foreign variables (FINF, OINF and FFR) for each country and for the GCC group (Figure 10). Figures 11 and 12 (Appendix 2) show a combined effect of such foreign shocks in the six GCC countries and the GCC group, to better visualize and compare such effects between countries and variables. The summary of the results follows as:

Impacts on domestic inflation rates:

- ✓ The international oil prices fuel domestic inflation in all the six GCC countries. It is a major determinant compared to the other shocks, except in Bahrain where its effect is slightly overcome by the international food inflation effects.
- ✓ The food foreign inflation that highly affects Bahrain and is the second positive effect in Kuwait, is less pronounced in Oman and Saudi Arabia. In Qatar and UAE, the food inflation effect exhibits the same trend and is negative especially in the beginning and fade in two years.
- ✓ For the Federal Funds Rate, the effect on domestic inflation is positive in Kuwait and Qatar and negative in KSA and UAE, while Bahrain and Oman

[6] This helps also to save the degrees of freedom in the VAR model requiring sufficiently large time series.

inflation rates seem to be insensitive to the FFR. The differences of the effects between countries could be attributed the effects of other factors that drive the inflation dynamics in these countries and the differences in the channels by which the FFR pass-through to the countries. The fiscal policy by especially its effects of subsidies has also its contribution in dampening the foreign imported monetary policy shock.

Impacts on Non-Oil GDP Growth rates:

- ✓ International oil prices affect positively the non-oil activities especially in Oman, Qatar and KSA, while this effect is temporarily negative especially in the UAE.
- ✓ The effect of food inflation is negative in Bahrain and positive in Kuwait and Qatar. The effect is small for the other countries.
- ✓ The effect of the FFR is negative for all countries except for Oman and UAE.

The differences between these results could be also due to the interaction effects of the foreign variables on each other. For example, international food commodity prices generally go along with the oil prices. However, for the FFR, it reflects the US monetary policy and its variation is not always to encounter the effects of international commodity prices. It is rather for the internal activity regulation. Thus, we do not necessarily expect a high effect of the commodity prices on the FFR.

To sum up, the work on the GCC monetary union could be enhanced in the future by broadening the approach to include other potential foreign shocks and study the potential endogenous effects of the group in the oil sector especially. The GCC countries separately are considered relatively small enough to encounter the endogeneity effects or in other ways the reverse causality that could run from those economies to the rest of the World. The enhancement for example, could be to consider a Global VAR model for the GCC countries considering the trade linkages between countries and their major partners. This should assess other demand and supply shocks that could come from other big economies such as China, Europe and Japan.

Conclusion

By adopting a concessive reasoning, Mundell (1961) managed to defend his OCA against the alternative of flexible exchange rate regime which was defended by Milton Friedman. His argument is based on the factors mobility as the most important variable of adjustment for Mundell (1961). McKinnon (1963) and Kenen (1969) complete this theory by developing other OCA criteria. The empirical evaluation of these criteria was due to the more recent studies. However, some authors criticized this theory to omit the political aspect, while others report that political union can be reinforced by the economic and monetary union. In any case, the debate on the optimality can be reduced to a case where the union should be sustainable and beneficial compared to the initial situation and with comparison to any other form without adhering strictly to Mundell optimality.

The development of the OCA theory was accompanied from the beginning by converging developments in the formation of the EMU. However, the ex-ante formation of the union seems to be non-optimal according to many authors. The experience of the recent Euro being considered; an ex-post evaluation is still far from reaching an optimum as revealed by several researches. This optimum is also conditioned by political factors such as the desire to ease the markets, to harmonize fiscal policies, social security systems and transfers, and reduce cultural and linguistic barriers to labor mobility.

Nevertheless, for the GCC monetary union as a new experience; geography, culture and language aspects play in favor of a successful monetary union. Furthermore, there may be convergence in production similarities, to a high degree, based on the dependency to the oil and mining sectors. However, the volatility of this sector has pushed to benefit from oil revenues to finance other sectors on the road to more diversified economies. Intra trade linkages are still insufficient compared to other monetary zones. Intra GCC trade volume represent around 8 to 10% of their total trade depending on years. It represents 7.7% of the GCC total trade in 2016[7] and about 7% excluding fuel goods[8]. This is due to the high concentration of oil products and the differences in the level of diversification between

[7] The Joint Arab Economic Report, 2017
[8] Calculated from Trade Map data https://www.trademap.org/Index.aspx .

countries. In both ways, the monetary union is to enhance the external position of the GCC countries as a group rather than its internal linkages especially in the short and medium run, while the reforms aiming at diversifying GCC economies will enhance the intra-trade linkages between the GCC countries and help smoothening the foreign shocks over the long run. The new currency should help to disconnect from the asymmetric shocks coming from the dollar currency as the countries currently peg their moneys to the latter, as well as the diversification should enhance smoothening form oil and food commodity shocks.

Finally, the OCA theory should not be isolated from the overall process of full regional integration. Its criteria are best satisfied as part of this process. The few criticisms addressed to it can be classified in the general discussion of regionalism against multilateralism. Some controversies have certainly helped to enrich the OCA theory. Monetary union is one ring in the whole chain involving trade integration, the customs union, financial integration and political union.

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Appendix 1. Tables

Table 3. Vector Auto-Regressive Lag Order Selection Criteria for the GCC Countries

Bahrain	**LogL**	**LR**	**FPE**	**AIC**	**SC**	**HQ**
0	-98.6587	NA	0.000218	5.758818	5.978751	5.835581
1	-26.5934	**120.1089***	**1.62e-05***	3.144076	**4.463675***	**3.604651***
2	-3.12613	32.59338	1.92e-05	3.229230	5.648495	4.073618
3	26.97162	33.44194	1.83e-05	**2.946021***	6.464952	4.174222
Kuwait	**LogL**	**LR**	**FPE**	**AIC**	**SC**	**HQ**
0	-151.218	NA	7.19e-05	7.486573	7.734811	7.577562
1	-78.231	121.6450	1.26e-05	5.725287	**7.462956***	6.362211
2	-29.6333	**67.11116***	**7.69e-06***	**5.125395***	8.352495	**6.308255***
3	6.063464	39.09644	1.05e-05	5.139835	9.856367	6.868631
Oman	**LogL**	**LR**	**FPE**	**AIC**	**SC**	**HQ**
0	-165.024	NA	0.008708	9.445785	9.665718	9.522548
1	-105.358	**99.44285***	**0.001289***	**7.519912***	**8.839511***	**7.980488***
2	-88.6565	23.19708	0.002226	7.980918	10.40018	8.825306
3	-74.1097	16.16312	0.005019	8.561651	12.08058	9.789852
Qatar	**LogL**	**LR**	**FPE**	**AIC**	**SC**	**HQ**
0	-99.3047	NA	0.000383	6.321499	6.548243	6.397791
1	-53.6241	74.75022	0.000112	5.068124	**6.428585***	5.525878
2	-15.242	**51.17602***	**5.55e-05***	**4.257093***	6.751272	**5.096308***
3	8.115106	24.06493	8.37e-05	4.356660	7.984557	5.577337
United Arab Emirates	**LogL**	**LR**	**FPE**	**AIC**	**SC**	**HQ**
0	-136.908	NA	0.001826	7.883778	8.103711	7.960540
1	-82.3463	90.93612	0.000359	6.241462	**7.561062***	6.702038
2	-49.044	**46.25324***	**0.000246***	**5.780222***	8.199487	**6.624610***
3	-41.347	8.552248	0.000813	6.741498	10.26043	7.969699
Saudi Arabia	**LogL**	**LR**	**FPE**	**AIC**	**SC**	**HQ**
0	-71.2269	NA	4.75e-05	4.234825	4.454758	4.311588
1	2.793830	**123.3678***	**3.17e-06***	**1.511454***	**2.831053***	**1.972029***
2	20.37483	24.41805	5.21e-06	1.923621	4.342886	2.768009
3	46.97714	29.55813	6.01e-06	1.834603	5.353534	3.062804

*: indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion
Endogenous variables: NONOILGDP, INF (Domestic Inflation), FFR, OINF, FINF
Sample: 1980 2015; Included observations: 36

Table 4. Granger Causality Tests Results between Variables in the GCC Countries

Pairwise Granger Causality Tests; Sample 1980-2015; Lags=2

Null Hypothesis:	Bahrain		Kuwait		Oman		Qatar		KSA		UAE	
	F-Statistic	*Prob.*	F-Statistic	*Prob.*	F-Statistic	*Prob.*	F-Statistic	*Prob.*	F-Statistic	*Prob.*	F-Statistic	*Prob.*
Domestic Inflation does not Granger Cause Non Oil GDP	1.45302	*0.249*	0.11485	*0.892*	2.77151	***0.078***	1.73287	*0.195*	0.90738	*0.414*	0.15885	*0.854*
Non Oil GDP Grwoth does not Granger Cause Domestic Inflation	0.96835	*0.391*	3.15306	***0.057***	3.49749	***0.043***	2.39487	*0.109*	1.72073	*0.196*	0.42172	*0.660*
Oil Inflation does not Granger Cause Non Oil GDP Growth	0.30080	*0.742*	1.11434	*0.341*	4.45514	***0.020***	5.60305	***0.008***	2.31471	*0.116*	4.98059	***0.013***
Non Oil GDP Growth does not Granger Cause Oil Inflation	0.63848	*0.535*	1.94981	*0.159*	0.34209	*0.713*	0.82989	*0.446*	0.39808	*0.675*	0.22119	*0.803*
Food Inflation does not Granger Cause Non Oil GDP Growth	1.42023	*0.257*	1.87176	*0.171*	0.53295	*0.592*	1.91419	*0.165*	1.02705	*0.370*	0.01537	*0.985*
Non Oil GDP Growth does not Granger Cause Food Inflation	5.43289	***0.010***	0.95222	*0.397*	2.47577	*0.101*	5.47173	***0.009***	0.00638	*0.994*	4.70869	***0.016***
Federal Funds Rate does not Granger Cause Non Oil GDP Growth	0.00460	*0.995*	1.45776	*0.248*	1.48298	*0.243*	0.61895	*0.545*	3.80952	***0.033***	2.00007	*0.152*
Non Oil GDP Growth does not Granger Cause Federal Funds Rate	1.67808	*0.203*	2.37540	*0.110*	0.06124	*0.941*	2.43607	*0.104*	0.64247	*0.533*	2.50413	***0.098***
Oil Inflation does not Granger Cause Domestic Inflation	9.32632	***0.001***	0.67110	*0.518*	4.72407	***0.016***	0.36842	*0.695*	1.21810	*0.310*	0.27686	*0.760*
Domestic Inflation does not Granger Cause Oil Inflation	0.06928	*0.933*	0.52632	*0.596*	0.55323	*0.581*	0.14313	*0.867*	0.07078	*0.932*	0.03235	*0.968*
Food Inflation does not Granger Cause Domestic Inflation	6.70504	***0.004***	5.85262	***0.007***	0.74882	*0.481*	1.47404	*0.246*	1.92888	*0.162*	1.66514	*0.206*
Domestic Inflation does not Granger Cause Food Inflation	1.40309	*0.261*	0.13513	*0.874*	2.73797	***0.080***	0.03684	*0.964*	0.70665	*0.501*	0.90301	*0.416*
Federal Funds Rate does not Granger Cause Domestic Inflation	1.58489	*0.221*	5.70859	***0.008***	3.72294	***0.036***	4.68387	***0.017***	2.02591	*0.149*	2.60849	***0.090***

Appendix 2. Graphs

Figure 4. Responses of Non-Oil GDP and Domestic Inflation in BAHRAIN Following Impulses on the Foreign Variables; Oil Inflation (OINF), Food Inflation (FINF) and US Interest Rate changes (FFR)

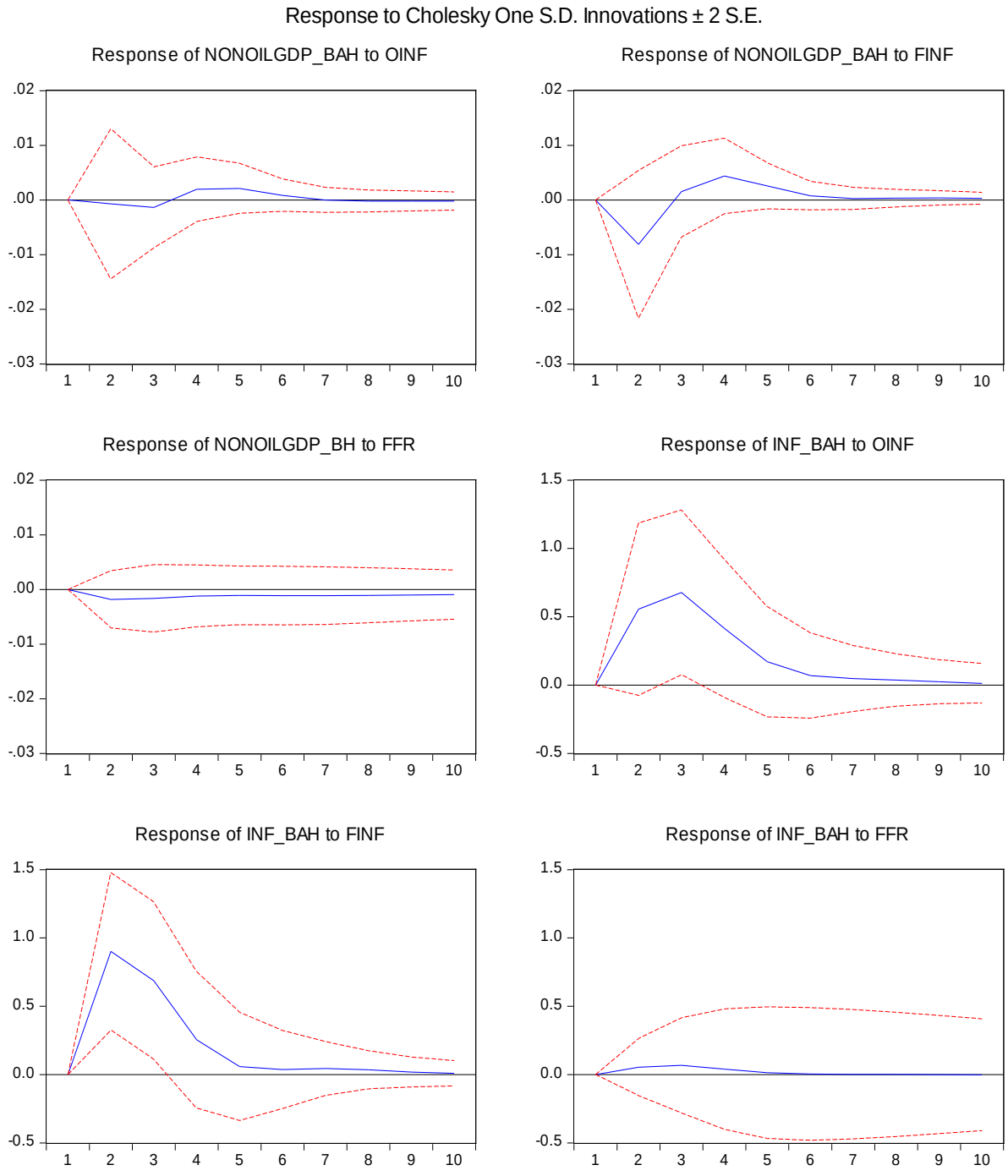

Figure 5. Responses of Non-Oil GDP and Domestic Inflation in KUWAIT Following Impulses on the Foreign Variables; Oil Inflation (OINF), Food Inflation (FINF) and US Interest Rate changes (FFR)

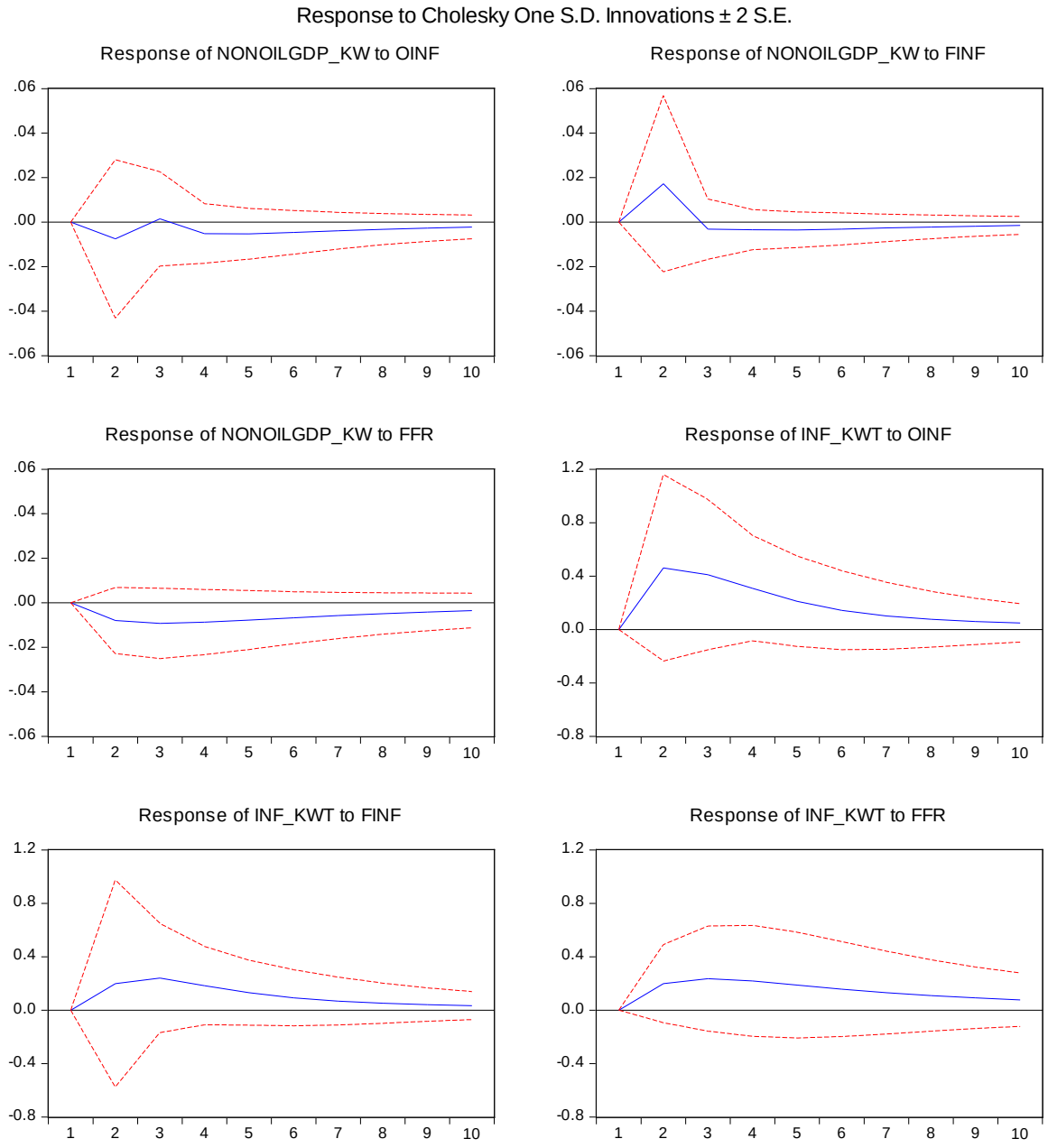

Figure 6. Responses of Non-Oil GDP and Domestic Inflation in OMAN Following Impulses on the Foreign Variables; Oil Inflation (OINF), Food Inflation (FINF) and US Interest Rate changes (FFR)

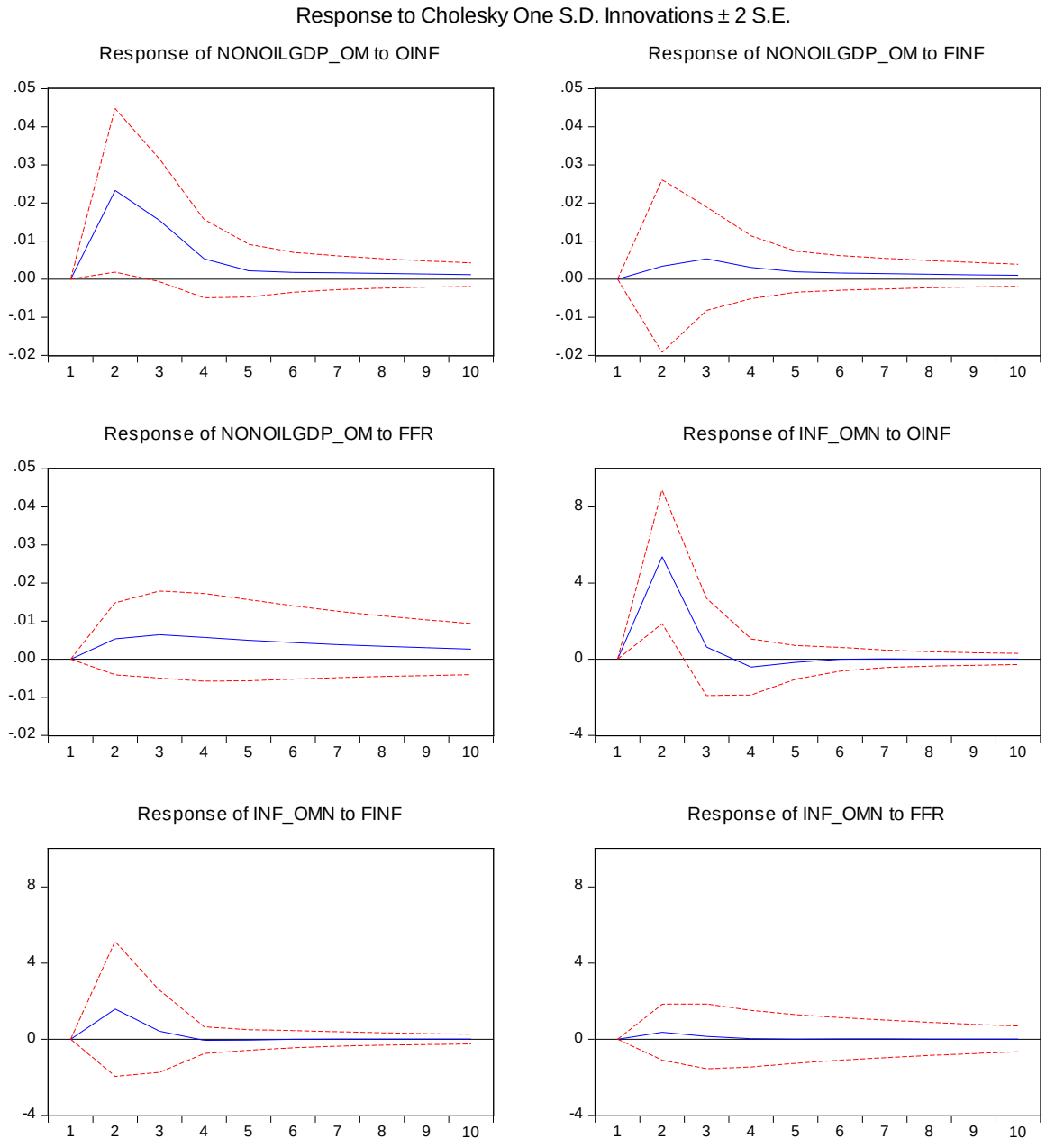

Figure 7. Responses of Non-Oil GDP and Domestic Inflation in QATAR Following Impulses on the Foreign Variables; Oil Inflation (OINF), Food Inflation (FINF) and US Interest Rate changes (FFR)

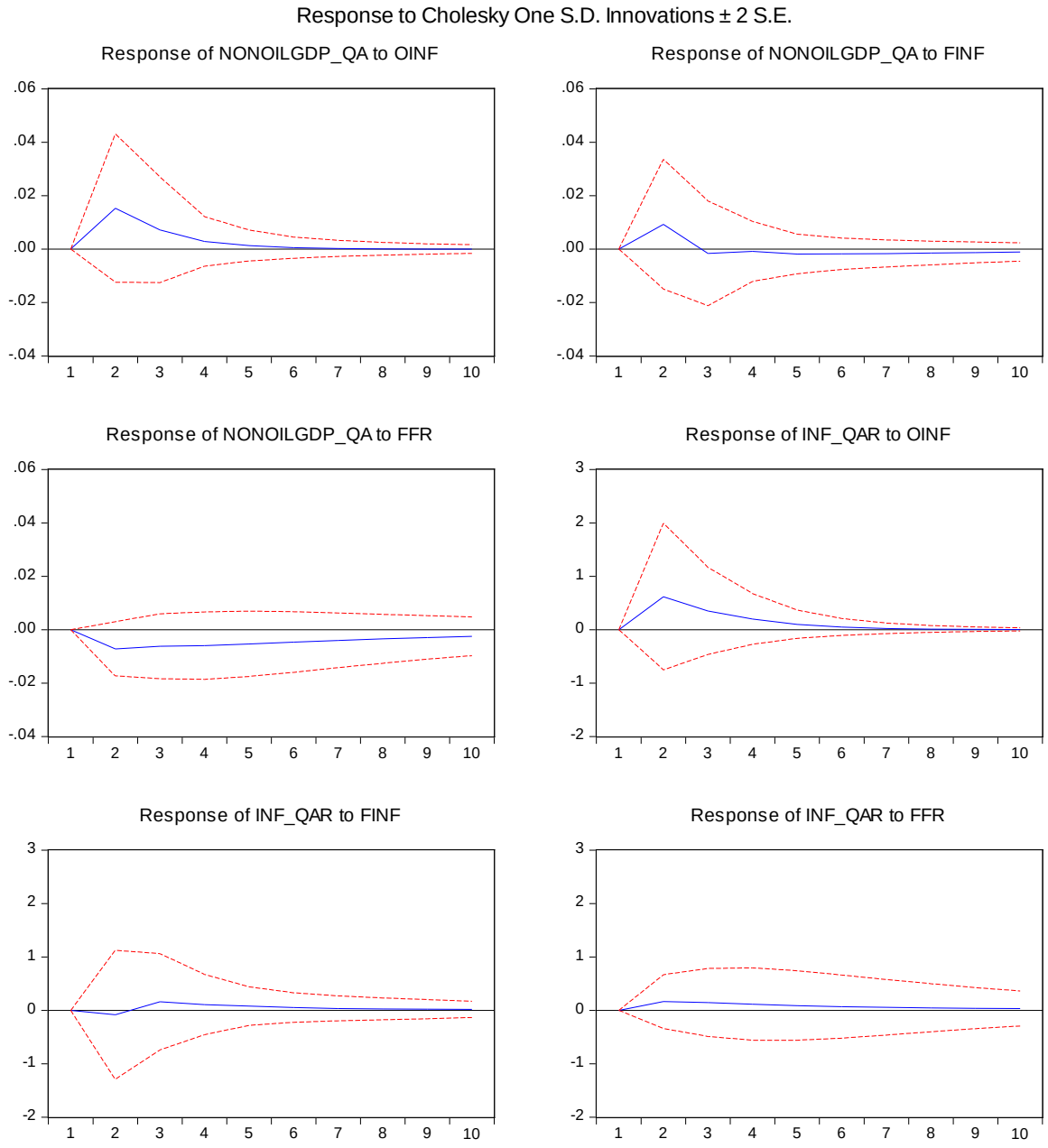

Figure 8. Responses of Non-Oil GDP and Domestic Inflation in KINGDOM of SAUDI ARABIA Following Impulses on the Foreign Variables; Oil Inflation (OINF), Food Inflation (FINF) and US Interest Rate changes (FFR)

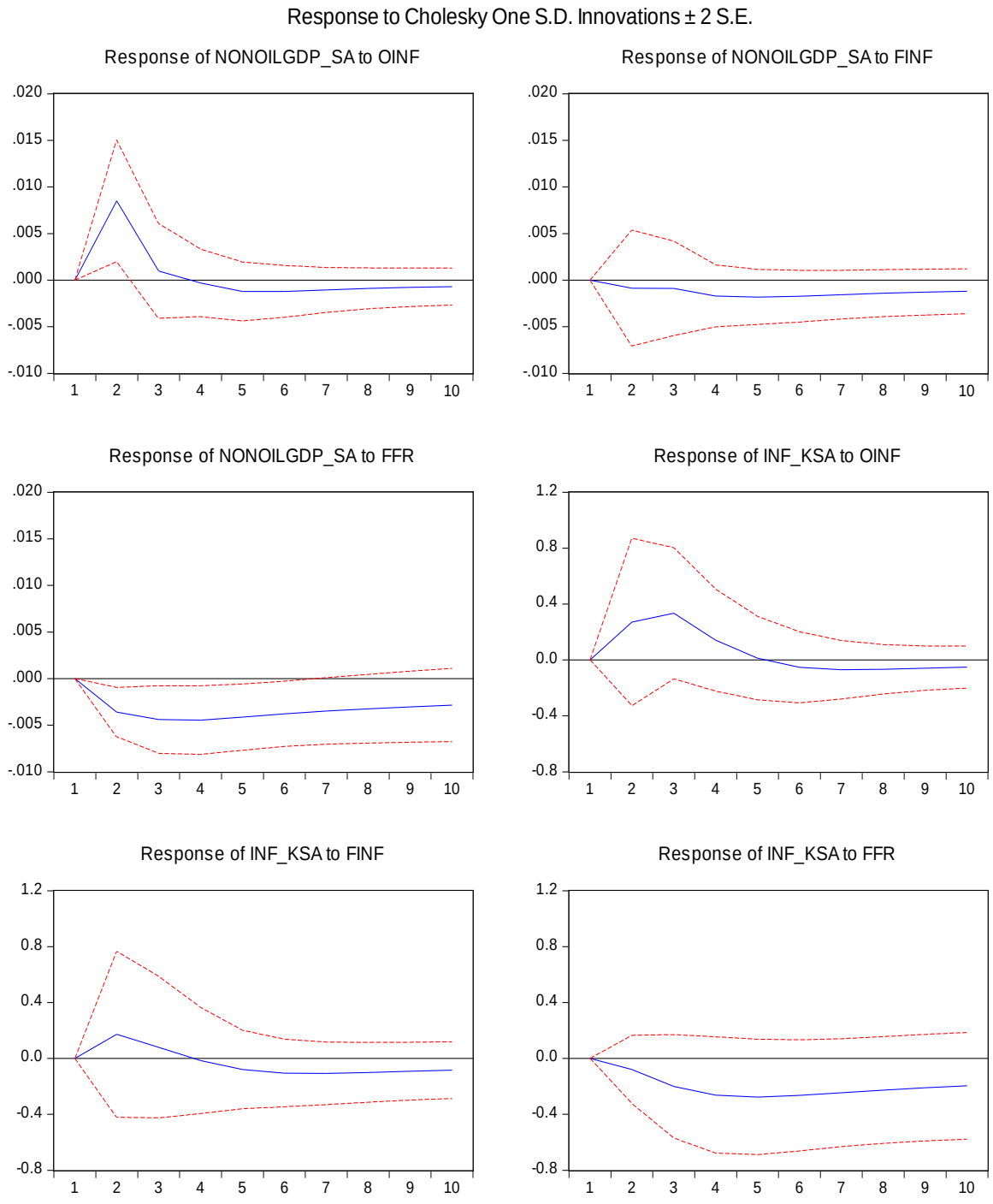

Figure 9. Responses of Non-Oil GDP and Domestic Inflation in UNITED ARAB EMIRATES Following Impulses on the Foreign Variables; Oil Inflation (OINF), Food Inflation (FINF) and US Interest Rate changes (FFR)

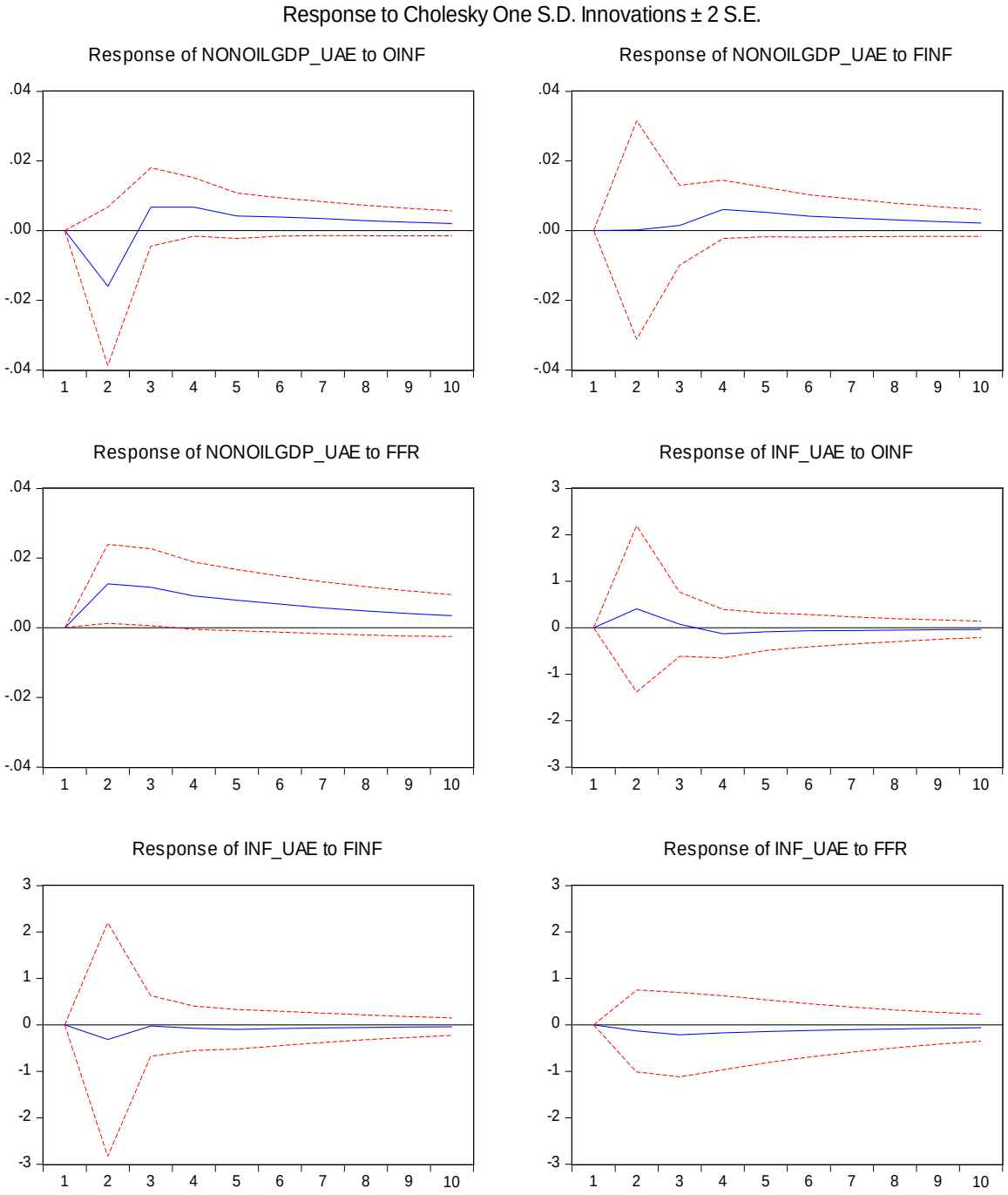

Figure 10. Responses of Non-Oil GDP in the GCC group Following Impulses on the Foreign Variables; Oil Inflation (OINF), Food Inflation (FINF) and US Interest Rate changes (FFR)

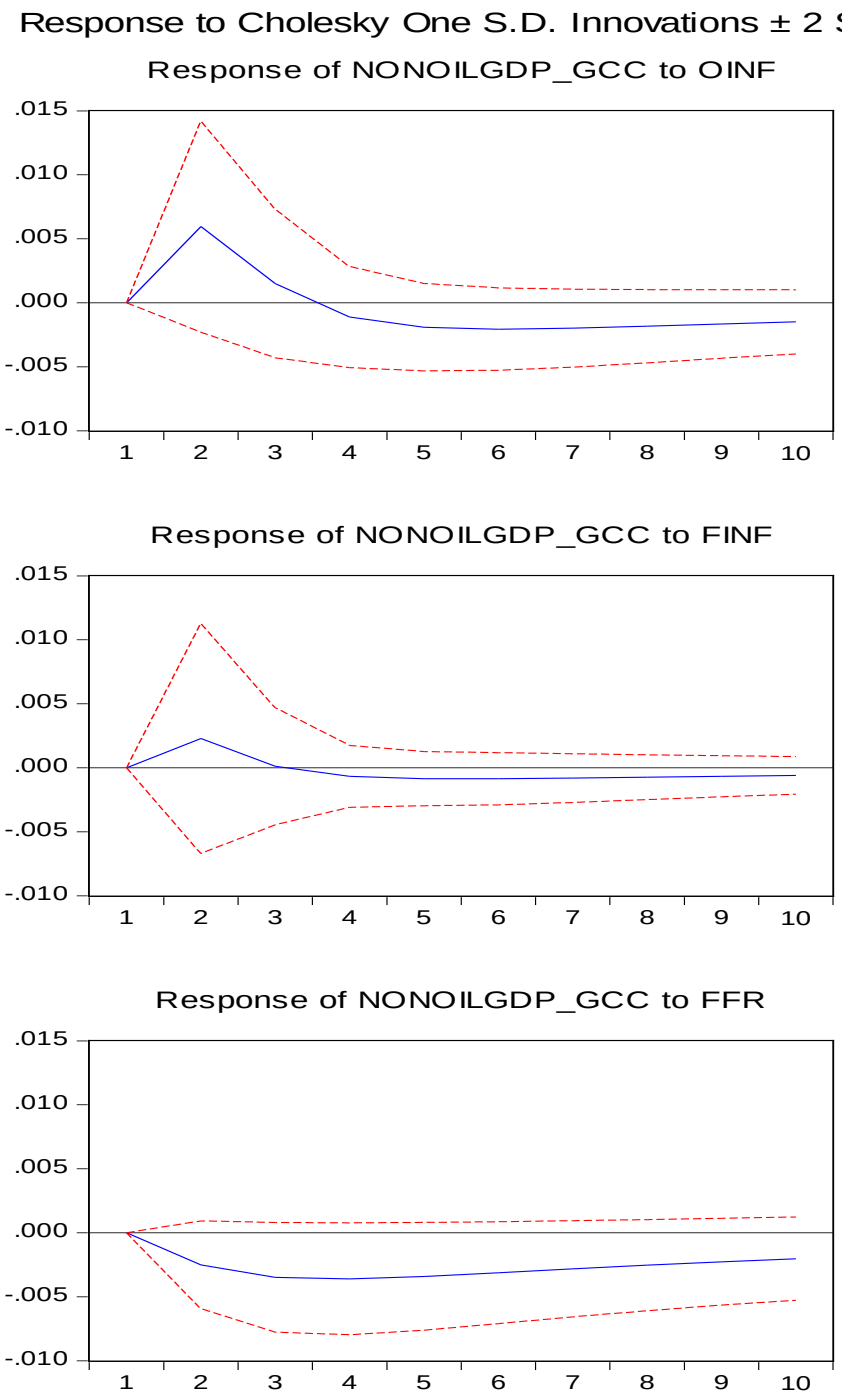

Figure 11. Combined IRFs for Non-Oil GDP and Domestic Inflation in the GCC countries.

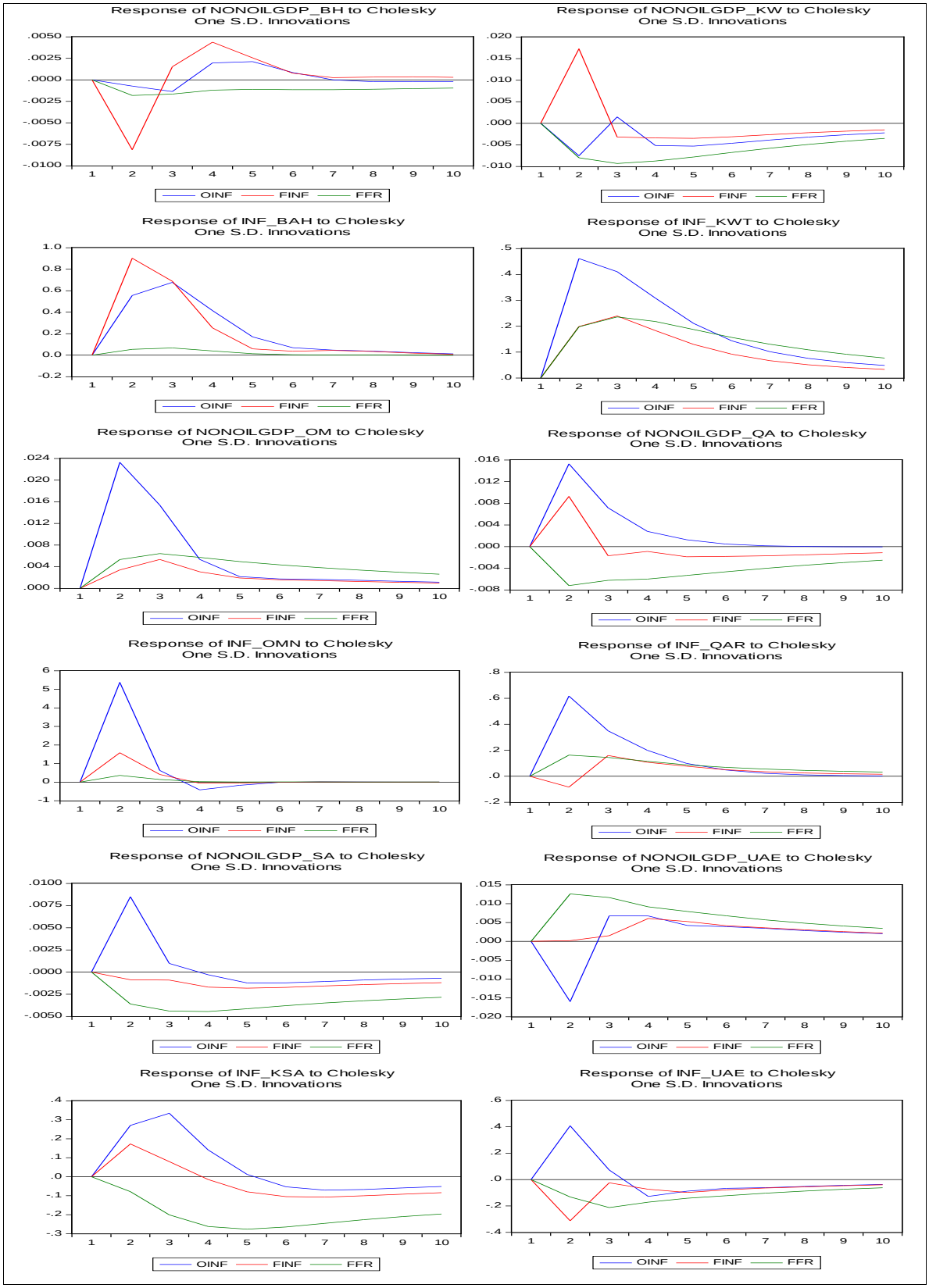

Figure 12. Combined IRFs for Non-Oil GDP in the GCC Group.