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ESSAYS ON ECONOMIC INTEGRATION AMONG THE GULF COOPERATION COUNCIL COUNTRIES

by

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ABSTRACT

FACULTY OF LAW, ART & SOCIAL SCIENCES

SCHOOL OF SOCIAL SCIENCES

<u>Doctor of Philosophy</u>

ESSAYS ON ECONOMIC INTEGRATION AMONG THE GULF COOPERATION COUNCIL COUNTRIES

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This dissertation focuses on three empirical research questions regarding economic integration among the GCC countries. Chapter 2 presents the first essay, which addresses the impact of the GCC economic agreements on intra-GCC trade, non-oil trade in particular as little is known about the scope for increased non-oil trade within the GCC. The gravity model of bilateral trade flows is applied to explain patterns of trade, and possible existence of trade creation between members. Understanding the determining factors of the GCC's non-oil trade volumes is a practical empirical task, as diversification of exports a way from natural resources is seen as one of the main goals of the GCC policies.

The second essay, chapter 3, looks at the determinants of business cycles synchronization among the GCC countries and their major trading partners. More specifically, the essay empirically investigates the relationship between trade, patterns of specialization and financial openness and how they determine the synchronization of business cycles. These factors will be evaluated in the context of a system of simultaneous equations approach, which provide an adequate investigation of the direct as well as indirect impact of trade, specialization, and financial openness on output synchronization. Analyzing what determines business cycle synchronization is an important task for a better evaluation of the costs and benefits of adopting the proposed common currency among GCC members.

Chapter 4 present the last essay, which considers how much income and consumption smoothing is undertaken by the GCC countries, where an efficient smoothing of output fluctuations is vital for reducing the impact of asymmetric shocks, therefore reducing the cost of adopting a common monetary policy. The empirical approaches are based on decomposing cross-sectional variance in income within the GCC countries, and will shed light on the channels through which income and consumption smoothing take place. Furthermore, the essay focuses on the role of investment portfolio diversification on smoothing income and consumption.

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Declaration of Authorship

I, Nayef Abdullah Alsadoun

Declare that the thesis entitled

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and the work presented in the thesis are both my own, and have been granted by me as the result of my own original research. I confirm that:

- this work was done wholly while in candidature for a research degree at this university;
- where any part of this thesis has been previously been submitted for a degree or any other qualification at this university or any other institutions, this has been clearly stated;
- where I have consulted the published work of others, this is always clearly attributed;
- where I have quoted from the work of others, the source is always given. With the exception of such quotations, this thesis is entirely my own work;
- I have acknowledged all main sources of help;
- where the thesis is based on work done by myself jointly with others, I have made clear exactly what was done by others and what I have contributed myself;
- None of this work has been published before submission.

Signed:………………………
Date:………………………...

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Finally, I would like to thank my wife, Yasmin and my daughter, Shoug, whose love and patient enabled me to complete this work.

Dedication

To the memory of my grandmother, Nourah, who taught me some of the greatest
lessons in life.

1 Introduction

In 1981, six Middle-Eastern countries, Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates (UAE) agreed to establish the Gulf Cooperation Council (GCC) with the goal of ensuring regional security and political stability among members in addition to working towards greater economic integration. The Unified Economic Agreement was ratified in 1981, with the ultimate objective of introducing a single currency.[1] According to Article 22 of the Council's Unified Economic Agreement of June 1982, "The member states shall seek to coordinate their financial, monetary and banking policies and enhance cooperation between monetary agencies and central banks, including an endeavour to establish a common currency in order to further their desired economic integration". 20 years later, the UEA was replaced by the new Economic Agreement, which set the targets for further integrations. The GCC aims at achieving full monetary and financial integration by adopting a common currency by the year 2010. However, there have been some recent setbacks on the path to establishing a monetary union. In 2006, Oman announced it would not join the monetary union and, in May 2009, the UAE unexpectedly ditched its plan for joining the union leaving four countries committed to the single currency. The decision by Oman and the UAE will not affect the broader membership in the GCC.

The GCC countries share a major characteristic, which is a heavy dependence on oil and gas as a source of income that causes high volatility in their outputs. Given that, the long-run economic sustainability will be determined by a reduction in dependence on energy as a primary source of income. The GCC countries have worked towards economic diversification since the establishment of the GCC, but progress has been slow and ineffective in some cases. The pressure to diversify in the GCC economies is strongly tied to oil and gas reserves, with Bahrain and Oman having limited reserves of oil compared to the other GCC members; therefore they

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[1] The Unified Economic Agreement has set out specific economic objectives as follow: implementing a free trade area; consolidating bargaining power in trade negotiations; establishing a common market; Harmonizing development plans; Adopting a common oil policy; Coordinating industrial policy and promoting joint projects to coordinate chains of production; Adopting a common legal framework for regional trade and investment.

face more pressure to diversify.[2] The pattern of economic diversification in each country will be a crucial factor for determining their future economic development.

The recent spike in oil prices has contributed to an impressive output growth for the GCC countries. The average growth for the period 2003-2007 has been around 18 percent, with the combined GDP for the GCC reaching over 803 billion US$ in 2007 (Table 1.1).[3] However, the members show different variations in terms of output and size. For instance, Saudi Arabia is by far the largest in terms of output and population, representing about 67 and 47 percent of the GCC's aggregate GDP and population, respectively. The UAE comes next in terms of population and output, representing about 12 and 22 percent, respectively. The remaining four countries are much smaller. Looking at the GDP per capita gives another picture, with the highest in Qatar and the lowest in Oman and Saudi Arabia (Figure 1.1 & 1.2).

Bilateral trade is fairly limited among the GCC countries, accounting for about 6 percent of their total trade. This is not surprising given that oil-related products are the main exports of the GCC countries, but not among them themselves. In general, GCC progress tended to be more effective in political rather than economic terms, where the GCC Unified Economic agreement suffered from a lack of commitment for over two decades. Part of the setback could be retained to the GCC's institutional lack of enforcement and inefficiency in implementing the required regulations for fostering the integration process.[4] For instance, the GCC countries have struggled to reach an agreement on the minimum external tariff, where it was only in 2003 when the GCC customs union came into effect and agreements were reached on a common external tariff, a unified customs code and the single-entry point principle.[5] The GCC common market, launched in early 2008, is expected to maximize economic gains from regional integration by promoting greater trade and investment. Furthermore, the proposed common currency is expected to increase gains by promoting policy coordination and price transparency, in addition to eliminating barriers to the movement of goods, services, capital and labour.

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[2] The GCC countries hold about 42 % and 23 % of global oil and gas reserves, respectively.
[3] According to the IMF WEO.
[4] The GCC institutions comprise three main institutions which are: Supreme Council, the Ministerial Council or the Secretariat General.
[5] The disagreement was mostly between Saudi Arabia which insisted on a high minimum external tariff and UAE which argue for a lower minimum external tariff. Further inefficiency in customs practices includes slow progress in product standardization and absence of unified laws and legislations.

This dissertation focuses on three empirical research questions regarding economic integration among the GCC countries. Chapter 2 presents the first essay, which investigates the impact of the GCC economic agreements on bilateral non-oil trade among the GCC countries. There has been little work done on the scope for increasing non-oil trade within the GCC, which represent about 80 percent of their bilateral trade. The gravity model of bilateral trade flows is applied to explain patterns of trade, and possible trade creation between members. Understanding the determinants of the GCC's non-oil trade volumes is an important aim, since the diversification of exports away from natural resources is seen as one of the main goals of the GCC policies. Based on the empirical analysis, the GCC members tend to trade less among themselves than with non-GCC trading partners. Testing for the Heckscher-Ohlin theory, the Linder hypothesis and the New Trade Theory, confirms the robustness of the association of the GCC with lower trade.

The second essay, chapter 3, looks at the determinants of business cycles synchronization among the GCC countries and their major trading partners. More specifically, the essay empirically investigates the relationship between trade, patterns of specialization and financial openness and how they determine the synchronization of business cycles. These factors will be evaluated in the context of a system of simultaneous equations approach, suggested by Imbs (2004), which provide an adequate investigation of the direct as well as indirect impact of trade, specialization, and financial openness on output synchronization. Analyzing what determines business cycle synchronization is an important task for a better evaluation of the costs and benefits of adopting the proposed common currency among GCC members. Trade has shown a significant association with more synchronized business cycles between the GCC countries and their trading partners, but not within the GCC countries themselves, while higher trade is showing an association with different patterns of specializations. Specialization is found to be a major determinant of business cycles co-movement among the GCC countries, both directly and indirectly. Though not significant within the GCC, financial openness has shown an association with higher output co-movement between the GCC countries and their trading partners. These findings are robust to alternative measure of output synchronization and trade intensity.

The third essay, chapter 4, considers how much income and consumption smoothing is undertaken by the GCC countries, where an efficient smoothing of output fluctuations is vital for reducing the impact of asymmetric shocks, therefore reducing the cost of adopting a common monetary policy. The empirical approaches are based on decomposing cross-sectional variance in income within the GCC countries, and will shed light on the channels through which income and consumption smoothing take place. Furthermore, the essay focuses on the role of investment portfolio diversification on smoothing income and consumption. The essay finds that only 40 percent of shocks to GDP are smoothed, which are mainly achieved via the saving channel. Among the investment portfolio, assets components have shown no significant role in insulating income and consumption from output fluctuation, while liabilities have shown a tendency to reduce income and consumption smoothing. Though lower than that achieved within the U.S., the results seem encouraging when comparing income smoothing by the GCC to that by the EU, EMU and East Asia.

Overall results seems to suggest that the GCC countries still have long way to go before gaining from establishing a monetary union compared to gains obtained by members of the EMU.

Taken all together, this dissertation provides an important assessment to the GCC's economic integration. Bilateral trade, determinants of business cycles synchronization, and smoothing of output fluctuations are three major issues in determining the success and stability of currency unions. To my knowledge, none of these issues have been discussed with respect to the GCC countries.[6] Furthermore, the first two essays contribute to the empirical literature by presenting an augmented version of the gravity model and the system of simultaneous equations respectively.[7]

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[6] Limited researches have investigated total trade, but none has investigated non-oil trade.
[7] Based on the Imbs(2004) implementation of the system of simultaneous equations.

Table 1.1: Gross Domestic Product (Billions U.S$)

	1980	1989	2000	2001	2002	2003	2004	2005	2006	2007*
Bahrain	3.072	4.113	7.966	7.969	8.489	9.745	11.233	13.456	15.848	18.443
Kuwait	28.724	23.855	37.721	34.901	38.14	47.835	59.439	80.8	101.56	111.76
Oman	6.342	9.372	19.868	19.949	20.325	21.784	24.772	30.923	35.729	40.391
Qatar	7.829	5.288	17.76	17.538	19.363	23.534	31.734	42.463	56.918	71.041
Saudi Arabia	164.29	95.344	188.69	183.26	188.8	214.86	250.67	315.76	356.63	381.94
UAE	29.626	27.922	70.221	68.677	75.892	88.959	107.3	135.2	164.17	180.18

Source: IMF WEO data

*IMF estimates

Figure 1.1: GCC population (Total: 36.5 million)*
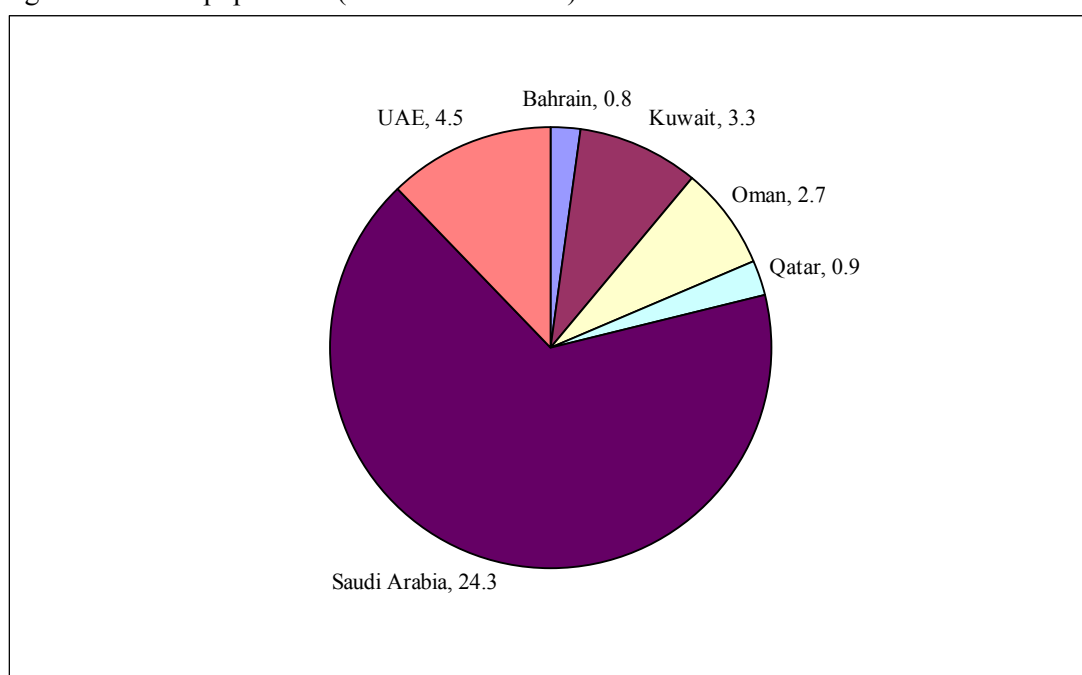
*Based on year 2006; Source: IMF WEO

Figure 1.2: GDP in billion US$ (Total: 803.7)*

Bahrain, 18.4
Kuwait, 111.8
UAE, 180.2
Oman, 40.4
Qatar, 71.0
Saudi Arabia, 381.9
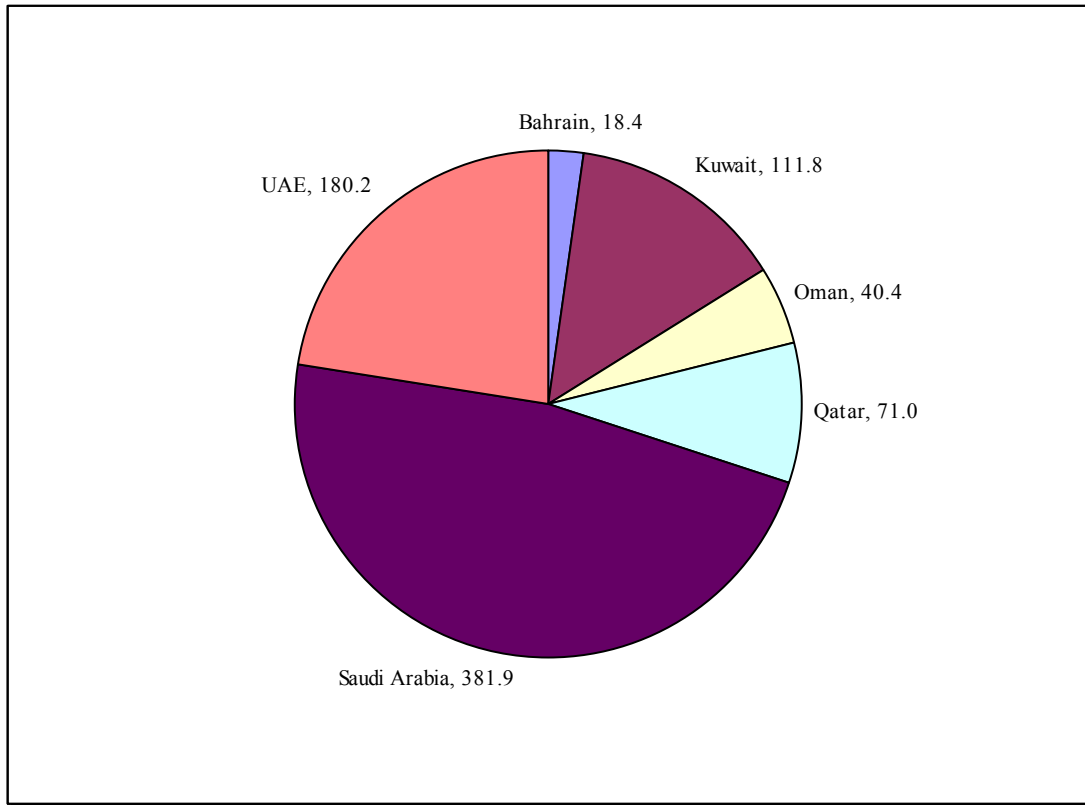
*Based on year 2006; Source: IMF WEO

Figure 1.3: GDP per capita (US$)*

Bahrain Kuwait Oman Qatar Saudi Arabia UAE
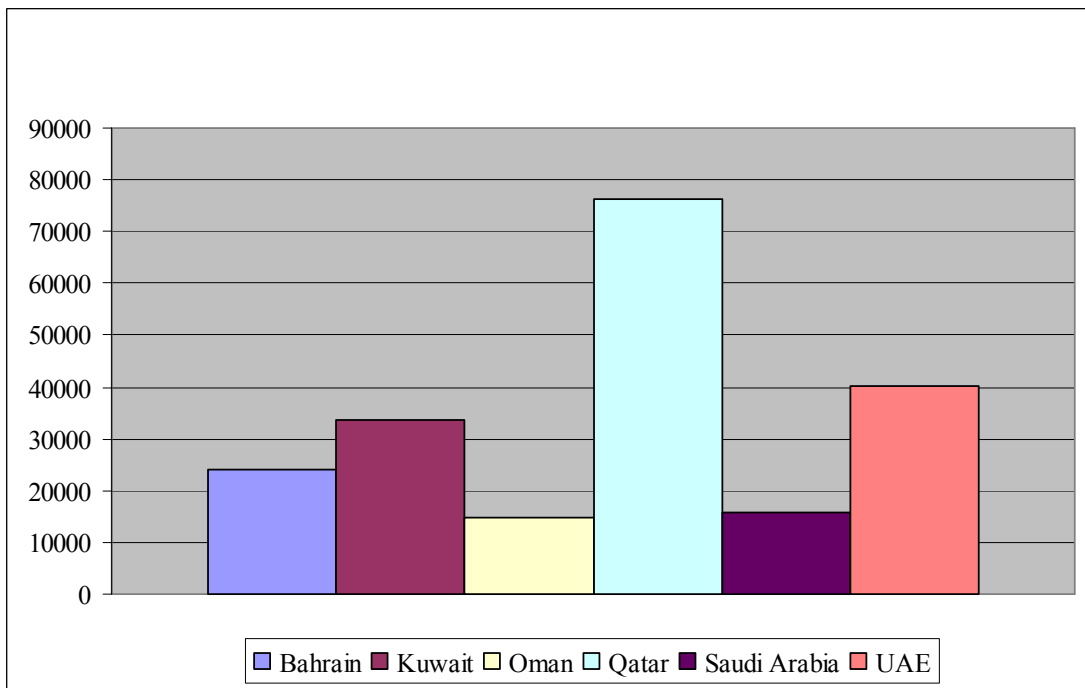
*Based on year 2006; Source: IMF WEO

2   Regional Trade Integration among the GCC Countries

2.1   Introduction

Regional Trade Agreements (RTAs) have received a high interest in the area of international economics, where there are various economic rationales behind regional integration. RTA allows for a collective bargaining power in negotiating trade agreements with other trading partners. In addition, it allows more efficient resource allocation and capital movement. Since the early 1990s, there has been a large increase in the number of RTAs, where about 421 RTAs have been notified to the General Agreement on Tariffs and Trade (GATT) and the World Trade Organization (WTO) up to December 2008. It is estimated that more than half of world trade is now conducted under the current 230 RTAs.[8]

Among earliest studies on regional integration, Viner (1950) introduced the theory of Customs Unions, stressing that they may cause trade creation and/or trade diversion.[9] Balassa (1961) introduced five possible stages in a regional integration process. The first stage involves a free trade area in which trade barriers between members are removed and commodities move freely within member countries. The second stage is the customs union, which is similar to the first stage but involves establishing a common external tariff for non-members. A common market is the third stage where free movement of factors of production and services is included in the customs union set-up. The fourth stage is economic union, in which the economic policies of the members are unified. The final stage is complete economic integration, where policies (for example, monetary and fiscal) are governed by a supra-regional authority.

RTA carries different effects, according to Hassan (2001), including static and dynamic effects that may lead to faster economic growth. The static effects include

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[8] WTO (2008) WORLD TRADE REPORT and www.wto.org

[9] Trade creation occurs due to the elimination of trade barriers such as tariffs, resulting in an increase in production and consumption; trade diversion, on the other hand, occurs when trade shifts from non-members to members as a result of tariff discrimination established by the customs union. Trade creation has a positive impact on welfare, as it involves substituting higher-cost products for lower-cost products from a member country. Trade diversion, on the other hand, has a negative impact on welfare, as low-cost products from non-members are substituted by high-cost products in member countries.

trade creation and trade diversion as discussed above. In addition, as the economic size of members increases, they improve their international bargaining power. Other static effects include decreased administrative costs and less contraband. The dynamic effects, on the other hand, include four possible effects: first, higher production efficiency due to enhanced competition and specialization; secondly, larger markets resulting in economies of scale and lower average production costs; thirdly, increase in competition leading to enhanced technological changes; and finally, lower uncertainty and risk, resulting in higher international investment.

To empirically measure the effect of RTA, many researchers have applied the gravity model to test for the trade effect of RTAs; this was first applied by Tinbergen (1962) and Pöyhönen (1963). The basic idea of the gravity model derives from the Newtonian Physics, where the force of gravity between two objects is proportional to the product of their mass and inversely related to the distance between them. Rose (2000) described the gravity model as having ''… a remarkably consistent (and thus, for economics, unusual) history of success as an empirical tool.''

Since the GCC was established more than two decades ago, trade has been fairly limited among the members, accounting for an average of 6 percent of total trade.[10] This is not surprising given that oil-related products are the main exports of the GCC countries, but are not highly traded among themselves. It is, however, more significant to focus on non-oil trade which represents about 80 percent of their intra-regional trade. It is an important economic question as to whether integration agreements have been important for the GCC regionalization process and to what extent they can explain the flow of intra-trade (non-oil) which came with them. Understanding its pattern is vital for assessing the efficiency of the GCC as a regional entity, where diversification of exports away from natural resources is seen as one of the main goals of the GCC's policies.

This essay addresses the effects of GCC economic agreements on bilateral trade, non-oil trade in particular, as little is known about the scope for increased non-oil trade within the GCC.[11] Applying the gravity model of bilateral trade flows to a set

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[10] Total trade repsent the sum of exports and imports
[11] Rose (2004) commented that decomposing trade by industry is an interesting area for further research.

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of panel data for the period 1980-2004 will help to explain patterns of trade, and the possible existence of trade creation among members. The gravity model will incorporates fixed effects with different approaches, allowing for monitoring possible unobservable effects to better explain bilateral trade.

Based on the empirical analysis, the formation of the GCC has been associated with less trade during the period 1980-2004, where GCC members tended to trade about 54 percent less among themselves than with non-GCC trading partners. A sensitivity analysis is performed in order to explore some possible factors behind the GCC's negative effect on bilateral trade. The sensitivity analysis controls for the impact of dependency on oil and for possible lagged impact of the GCC formation on trade. The overall bilateral country size, similarity in country size, and differences in relative factor endowment are possible explanations for the bilateral trade behaviour which will be used to test for the Heckscher-Ohlin theory, the Linder hypothesis and the New Trade Theory. The results find that higher trade is associated with similarity in country size which is in support for New Trade Theory. On the other hand, differences in relative factor endowment have shown to contribute to higher trade among the GCC members which is in support for the Heckscher-Ohlin theory. Overall, the sensitivity analysis confirms the robustness of the association of the GCC with lower trade.

Studies on the trade patterns for the GCC countries are limited. To my knowledge, this is the first empirical study on the impact of the GCC formation on the bilateral non-oil trade. Studies on the GCC suffer from model misspecification as they don't account for unobserved heterogeneity, where its absence is assumed to overstate the role of regional integration.[12] Furthermore, the sensitivity analysis can be view as an augmented version of the gravity model. Taken all together, this essay provides an important contribution to the empirical literature and the empirical assessment of the GCC economic integration.

The paper is organized as follows. The next section is devoted to the background concerning the GCC economic integration. The main empirical approach

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[12] Egger (2000) and Cheng and Tsai (2008) find regional coefficients to be overstated when unobserved heterogeneity is not accounted for.

and results are discussed in the third section. The fourth section is a sensitivity analysis, while the last section concludes.

2.2 Patterns of non-oil trade among the GCC countries

Trade has been used by many researchers to evaluate the success of RTAs, as trade effects are more tangible and easier to evaluate. Therefore, intra-GCC trade will be the main criterion in this essay when evaluating the GCC integration status.[13] There has been considerable skepticism regarding the efficiency of the GCC in promoting intra-trade, which has been characterized as being slow since the formation of the GCC and the free trade zone in 1981 and 1983 respectively.

The GCC countries are considered open economies, with a total trade with the rest of the world of over 559 billion US$ in 2006[14], over 65 percent of the exports were oil-related. Since the GCC establishment, intra-trade between members has been fairly limited, accounting for approximately 6 percent of total trade. Total intra-GCC trade increased more than twofold during the period 1980-2006, from 14.88 billion US$ in 1980 to 34.5 billion US$ by 2006. Such growth is high compared to the growth of the GCC's trade with the rest of the world, which grew from about 385.3 billion US$ in 1980 to about 559.1 billion US$ in 2006, a less than twofold increase. Compared with other RTAs, such as the EU, ASEAN, NAFTA and Mercosur, the GCC has the lowest intra-regional trade share.[15] Owing to their geographical and historical proximity, the GCC members can be seen as natural trading partners. Wonnacott and Lutz (1989) developed the concept of natural trading partners, where two member countries may have considerable trade, owing to geographical proximity and low transportation costs. They argue that the probability of trade creation increases as the two members are natural trading partners.

The low level of intra-trade can be mainly attributed to the similarity in factor endowment (i.e. oil and gas), and the low level of diversification. The high dependency of the GCC countries on a single commodity led them to trade more with

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[13] All values in this section will be presented as real values based on year 2000 prices.
[14] Total exports and imports as reported by the IMF DOT
[15] See Al Hinai (2004) and Sturm and Nikolaus (2005) for more information.

non-GCC members. In addition, regulatory barriers may make an additional contribution to the low level of intra-trade.

However, it is optimistic if we look at the (non-oil) exports which account for about a third of the total exports. Intra-GCC trade includes a low share of oil exports, where non-oil products account for about 80 percent of the total trade within the GCC during the period 1980- 2004. Total intra-GCC non-oil exports increased from 1.61 billion US dollars in the year 1980 to 10.05 billion US dollars by the year 2004, an increase of more than sixfold. Non-oil exports to the world, on the other hand, rose from 4.76 billion US dollars in 1980 to 41.2 billion US dollars by 2004, a more than eightfold increase.[16] An overview of the components of non-oil exports over the study sample shows major changes in most of the GCC countries. Comparing components of non-oil exports in 1980 and 2004, figures 2.1-2.12, shows the prevalence of chemical exports over manufactured exports for countries that are highly dependant on natural resources. For instance, exports from Chemical sector represent at least 60 percent of total non oil exports in Kuwait, Qatar and Saudi Arabia. Exports from Bahrain, Oman, and UAE, on the other hand, are mostly composed of manufactured goods. The following is a review of the trade patterns for each GCC member.[17]

2.2.1 Bahrain

Due to its low dependency on oil exports, Bahrain is one of the most highly integrated members. Bahrain's total non-oil exports account for about 30 percent of total exports during the 1980s. That share increased to more than 50 percent during the period from 1990 to 2004.[18] The GCC's share of total non-oil exports from Bahrain represented about 35 percent during the 1980s, which then decreased to less than 30 percent during the period from 1990 to 2004. Non-oil exports to GCC members increased from about 234.7 million US dollars in 1980 to more than 781 million US dollars in 2004, a rise of more than threefold. On average, Bahrain's share of intra-GCC non-oil exports was more than 11 percent during the 1980s, which is considered a high ratio compared to its economic size, with all other members, apart from UAE, having a

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[16] According to the United Nations statistics (UNComtrade)

[17] Based on the United Nations statistics (UNComtrade), See figures 2.13-2.18.

[18] In 1980, non-oil exports represented less than 14 percent of total exports, while representing more than 54 percent by 2004. See figures 2.19 and 2.20 for more information.

ratio of less than 13 percent. This ratio fell slightly to an average of 7 percent during the period 1990 to 2004.

Bahrain's imports from GCC members showed a much higher increase, rising from about 44.66 million US dollars in 1980 to about 576.4 million US dollars in 2004, slightly less than a thirteen fold increase. In terms of imports from GCC members, Bahrain receives the lowest share, accounting for an average of just over 4.2 percent during the 1980s. Later years showed more openness, with that share increasing to more than 7.2 percent during the 1990s, and remaining at more than 6.2 percent during the period from 2000 and 2004.

Saudi Arabia is considered Bahrain's major partner during the period 1980-2004. During the period 1980-1985, Bahrain's non-oil exports to Saudi Arabia constituted more than 77 percent of its total non-oil exports to the GCC. That share decreased slightly to an average of 60 percent during the rest of the 1980s and the 1990s, then fell to an average of 43 percent for the period from 2000-2004.

UAE and Saudi Arabia are the major GCC suppliers of Bahrain's non-oil imports. During the 1980s, Bahrain received an average of 50 percent and 33 percent of total intra-GCC imports from the UAE and Saudi Arabia respectively. Saudi Arabia supplied Bahrain with an average share of 58 percent and 60 percent during the 1990s and the period from 2000-2004 respectively. The increase in Bahrain's imports from Saudi Arabia is probably due to the establishment of the bridge connecting Bahrain to Saudi Arabia. UAE continued to be a major trading partner with an average share of 30 percent during the period from1990-2004.

2.2.2   Kuwait

Kuwait's non-oil exports constitute a low share of its total exports, that share ranging from an average of about 5.4 percent and 8 percent during the 1980s and the period from 1990-2004 respectively. [19] Kuwait's share of total GCC non-oil exports experienced a gradual fall during the study period for this paper. While Kuwait's

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[19] In 1980, the share of non oil exports relative to total exports was below 3 percent, and remained below 8 percent in 2004(Figure 2.21 & Figure 2.22)

share was more than 12 percent during the 1980s, it dropped by about 70 percent to a share of less than 4 percent during the rest of the period from 1990-2004.[20]

GCC members receive a high share of Kuwait's non-oil exports. During the 1980s, Kuwait exported more than 37 percent of its total non-oil exports to GCC members. However, that share decreased to an average of 27 percent and 24 percent during the 1990s and the period from 2000-2004 respectively. In terms of export growth, non-oil exports to the GCC had been falling by 13.2 percent during the 1980s, but then recovered, rising by an average of 52.4 and 54.3 percent during the 1990s and the period from 2000-2004 respectively.

Kuwait's non-oil imports from GCC members represented an average of more than 11 percent during the 1980s, and increased slightly to an average of about 14 percent during the 1990s. That share then declined to an average of 11.3 percent during the period 2000-2004. In terms of import growth and values, Kuwait's non-oil imports from the GCC experienced a more than fourfold increase during the 1980s, when total imports increased from a value of about 137.8 million US dollars in 1980 to 591.4 million US dollars by the end of 1989. Imports more than doubled during the 1990s, when imports increased from about 299.3 million US dollars in 1990 to about 743.2 million by the end of 1999. The rest of the period from 2000 to 2004 showed an increase of only 25.7 percent, when imports increased from about 772 million US$ in 2000 to about 970.3 billion US$ by 2004.

Being the only GCC member to share a border with Kuwait, Saudi Arabia is considered Kuwait's main GCC trading partner in terms of both exports and imports. In terms of exports, Saudi Arabia received an average of 80 percent of Kuwait's non-oil exports to the GCC during the 1980s, decreasing to an average of 43 percent for the rest of the period from 1990-2004. In terms of non-oil imports within the GCC, Kuwait received an average of more than 44 percent from Saudi Arabia during the 1980s, increasing to an average of over 63 percent for the rest of the period from 1990 to 2004.[21]

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[20] Excluding exports in 1991 that had been affected severely by the Iraqi invasion
[21] Kuwait's exports were severely affected during the Iraqi invasion, exports dropping by an average 87percent and 31percent in 1991 and 1992 respectively. Imports from the GCC experienced a lower decrease in 1991, 14percent. In 1992, however, Kuwait's imports increased by more than 132percent.

2.2.3 Oman

In terms of economic diversification, Oman made gradual progress in diversifying its exports and minimizing dependency on oil. In 1980, Oman's non-oil exports were only about 4 percent of its total exports, rising to 11 percent by the end of 1989. That share increased gradually by an average of 2 percent a year, to reach about 23 percent by the end of 1999. The rest of the period from 2000-2004 had an average share of 20 percent.[22] Oman is considered to be a highly integrated GCC member, exporting an average of 47 percent, 50 percent and 45 percent of its total non-oil exports to the GCC during the 1980s, 1990s, and the period 2000-2004 respectively. In terms of trade value, Oman's exports to other GCC members more than doubled during both the 1980s and 1990s, increasing from more than 149.1 million US dollars in 1980 to about 318 million US dollars by the end of 1989, and from 300.9 million US dollars in 1990 to about 827.8 million by the end of 1999. The rest of the period from 2000-2004 showed a lower growth, less than 18.8 percent.

Oman's share of total intra-GCC exports was more than 10 percent during the 1980s, increasing to over 13 percent for the rest of the period from 1990 to 2004. In terms of imports, Oman received the second highest share of GCC exports, ranging from about 30 percent and 28 percent during the 1980s and the 1990s respectively.[23] For the rest of the period from 2000-2004, that share fell slightly to about 24.4 percent.

The UAE is by far the major trading partner among GCC members in terms of both exports and imports. An average of 90 percent of Oman's non-oil exports to the GCC went towards the UAE during the 1980s. That share fell slightly to an average of 87 percent and 80 percent during the 1990s and the period from 2000-2004 respectively. In terms of imports from GCC members, UAE supplied Oman with 94 percent and 87 percent of its total imports during the 1980s and the period from 1990-2004 respectively.

The high trade connections between Oman and the UAE can be mainly explained by geographical proximity, and convenient access by land and sea. In

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[22] See figures 2.23 & Figure 2.24 for a comparison between 1980 & 2004.
[23] Second to Saudi Arabia during the 1980s and UAE during the period from 1990-2004

addition, there is a high connection between the two countries in terms of cultural and political aspects. Even though Oman shares a border with Saudi Arabia, there are no modern transportation facilities between them.[24]

2.2.4 Qatar

Prior to 1983, Qatar's non-oil exports used to account for an average of 4 percent of its total exports only. For the rest of the 1980s, Qatar experienced an increase in non-oil exports reaching an average of 14 percent. That share did not change much during the 1990s and the period from 2000-2004 (14 percent and 12 percent respectively).[25]

More than 46 percent of Qatar's non-oil exports went towards GCC members in the 1980s and 1990s, but then fell to an average of 27 percent for the period 2000-2004. Exports to other members increased from 251.7 million US dollars in 1980 to 298.7 million by the end of 1989, an increase of more than 18 percent. On the other hand, the 1990s witnessed a negative growth of 17 percent. By 2004, exports reached about 829.8 million US which represents a less than fourfold increase since 2000.

In terms of share of the GCC intra-trade, Qatar's non-oil exports represent an average of 11 percent of the GCC's intra-exports during the 1980s. For the 1990s and the rest of the period 2000-2004, Qatar's share dropped to less than 6 percent and 5 percent respectively. In terms of imports, Qatar receives a low share of GCC non-oil exports, very similar to that of Bahrain. During the 1980s, the share was less than 5 percent, increasing slightly to an average of 7 percent and 8 percent during the 1990s and the period 2000-2004 respectively.

Saudi Arabia and the UAE are Qatar's major trading partners, each receiving an average of 40 percent of Qatar's total non-oil exports during the study period. Prior to 1983, Saudi Arabia received an average of 57 percent, while the UAE received an average of 33 percent. For the rest of the 1980s, after GCC's free trade zone took effect, Saudi Arabia and UAE shares dropped to an average of 48 percent and 27 percent. Kuwait, which had an average share of 8 percent prior to 1983, increased its imports from Qatar to an average of 22 percent for the rest of the 1980s. The rest of

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[24] Due to the presence of the Empty Quarter desert between Oman and Saudi Arabia.
[25] See figures 2.25 & figure 2.26 for a comparison between 1980 & 2004.

the period shows a decrease of Saudi Arabia's share to an average 36 percent, while there was an increase in the UAE share to an average of 49 percent.

As regards Qatar's non-oil imports from the GCC, Saudi Arabia and the UAE were the source of more than 80 percent during the period 1980-2004. It is interesting to note that Qatar's imports from Saudi Arabia prior to GCC's free trade zone, 1980-1983, comprised an average of only 10 percent of its total imports, while that share increased to more than 30 percent for the rest of the 1980s. As in the pervious cases, geographical proximity and a shared border made Saudi Arabia and the UAE major trading partners among GCC members.

2.2.5 Saudi Arabia

Saudi Arabia is the largest economy among the GCC members in terms of income size and oil exports. High oil production was achieved at the expense of non-oil exports, which averaged only 1.2 percent for the pre-free trade zone period (1980-1983). The share of non-oil exports to total exports improved slowly, at an average of 1.5 percent a year for the rest of the 1980s. For the 1990s and the period from 2000-2004, the share of non-oil exports increased slightly to an average of more than 12 percent and 13 percent respectively.[26]

GCC members' share of Saudi Arabia exports was low until the mid 1980s, representing an average of 7.8 percent. For the rest of the 1980s, the GCC share increased to an average of 12.8 percent. The share continued to increase to an average of more than 19 percent and 22 percent during the 1990s and the period from 2000-2004. In terms of trade value, Saudi exports to the GCC increased remarkably by more than ninefold during the 1980s, from about 88.5 million US dollars in 1980 to about 833.5 million by 1989. Non-oil exports to the GCC continued their high growth for the rest of the period, with export values in 2004 representing a slightly less than fivefold increase over the 1990 level.

In terms of imports from the GCC, Saudi Arabia's imports represent a share of about 23 percent for the whole sample study. During the 1980s, Saudi Arabia used to have the highest share of imports from the GCC, with an average share of 32 percent.

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[26] See figures 2.27 & figure 2.28 for a comparison between 1980 & 2004.

The share dropped for the rest of the period from 1990-2004 to less than 18 percent, third behind the UAE and Oman.

Kuwait and the UAE are considered the major trading partners of Saudi Arabia in terms of exports. During the 1980s, Saudi Arabia exported an average of 45 percent and 29 percent of its intra-GCC non-oil exports to Kuwait and the UAE respectively. Kuwait's share fell during the 1990s and the period from 2000-2004 to an average of 31 percent and 22 percent respectively. On the other hand, the UAE share increased to an average of 35 percent and 46 percent during the 1990s and the period from 2000-2004 respectively.

In terms of Saudi Arabia's non-oil imports from the GCC, the UAE, Kuwait and Bahrain were the source of 80 percent of the imports during the sample study. Kuwait had the largest share (30 percent) during the 1980s, dropping to 9 percent for the rest of the period. The UAE was the source of about 27 percent of imports during the 1980s, and then became the source of about half of the imports for the rest of the period. Bahrain had a steady share, ranging from an average of 25 percent and 23 percent for the 1980s and the rest of the period from 1990-2004 respectively.

2.2.6   United Arab Emirates

Second to Bahrain, the UAE has the highest share of non-oil exports to total exports with a ratio of 37 percent by the year 2004. Prior to 1983, the UAE had a low share of non-oil exports of less than 5 percent, but then increased this share to an average of 12 percent for the rest of the 1980s. The remaining period had an average share of 27 percent. [27]

On average, 38 percent of the UAE non-oil exports are toward GCC members. However, this share has witnessed a gradual fall during the period 1980-2004. The average share dropped from 50 percent to 35 percent during the 1980s and the 1990s respectively. The rest of the period 2000-2004 experienced a further reduction, to an average of less than 27 percent. Such a reduction can be explained by the growth of UAE exports to other regions in the Middle East, Asia and Africa.

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[27] See figures 2.29 & figure 2.30 for a comparison between the share of non-oil exports in 1980 & 2004.

By 1985, UAE exports to members had more than twofold increases, while dropping by more than 18 percent for the period 1985-1998. Exports resumed their growth during the 1990s, more than doubling by 1999. The rest of the period 2000-2004 showed a continuous growth which further increased by more than 50 percent in 2004. In terms of the share of intra-GCC non-oil exports, the UAE had the highest among GCC members, accounting for 40 percent for the whole period.

In terms of imports from GCC members, the UAE's share was one of the highest among members. In the 1980s, the UAE was the target of about 18 percent of intra-GCC exports. The rest of the period showed an increase in the UAE share to an average of 27 percent and 31 percent for the 1990s and the period from 2000-2004 respectively. In terms of import value from members, UAE imports increased from about 280.4 million US$ in 1980 to about 708 million by 1989, a less than threefold increase. A similar pattern appears for the remaining years. Similarly, 45 percent and 38 percent of the UAE imports from the GCC are from Oman and Saudi Arabia respectively.

From the above analysis of trade patterns for each member, the following can be noted:

- The share of non-oil exports is less than 25 percent of total exports for most GCC members, and represents over 80 percent of the intra-GCC trade. All members, except Saudi Arabia, export a range of 20 percent-45 percent internally. The increasing share is a good indication for potential intra-regional trade, as GCC members diversify their economies further.

- Sharing a common border is a significant factor in trade between members, where almost all GCC members trade the most with one or two members who share a common border.

- Unlike GCC's total exports, which are highly correlated with the movement of oil prices, GCC's intra non-oil exports are not affected by the fall of oil prices as can be seen in Figure 2.31. Therefore, the more the GCC members increase the share of non-oil exports, the less their economies are hurt by oil price fluctuations.

2.3   Assessing the Effect of the GCC on Trade: A Gravity Model Approach

The gravity model has been used in much empirical research since the 1960s in order to explain patterns of trade between countries. It states that trade between two countries is determined by supply conditions in the exporting country and demand conditions in the importing country in addition to stimulating and resisting factors. For instance, volumes of trade between two countries are proportional to their real national incomes (GDP), and negatively related to the geographical distance between them. The gravity model is widely used in empirical economic research for estimating the effect of regional agreements (e.g. currency unions, free trade areas, customs unions) on bilateral trade between countries and for analyzing the trade potential associated with these agreements. Its empirical success made it the work-horse model for explaining bilateral trade.

The gravity model will be applied to bilateral trade flows in the GCC using a set of panel data for the period 1980-2004. The model will help to explain patterns of trade, and the possible existence of trade creation among members. The next two sections outline the literature on application of the gravity model and its specification, respectively.

2.3.1   Gravity Model Literature

The gravity model basically includes four variables to estimate effects on bilateral trade: GDP, population or GDP per capita, geographical distance, and exchange rate volatility (Linnemann, 1966).

The gravity model in its general form can be expressed as:

$$X_{ij} = \beta_1 Y_i^{\beta_2} \ Y_j^{\beta_3} \ D_{ij}^{\beta_3} \tag{2.1}$$

Where X_{ij} is the export value flow from country i to country j, Y_i and Y_j are the national income (GDP, or GNP) for countries i and j respectively, and finally D_{ij} is the geographical distance (resistance) between the two countries. β_1, β_2, and β_3 indicate that there is no necessary proportional relation between the variables. The

rationale for including GDP is that the size of exports depends on the exporter country's economic size, measured by productive capacity, in addition to the importer country's economic size, measured by absorptive capacity, which influences its ability to import.[28] Geographical distance is included as a proxy of transportation costs correlating negatively to the volume of exports (Bergstrand (1985, Bergstrand, 1989); Wang and Winters (1991); Harrylyshyn and Pritchett (1991); Erzan et al., (1992); Foroutan and Pritchett, (1993)). It would be logical to expect that technological development, especially in terms of telecommunication and transportation, would lower the negative impact of distance. However, Disdier and Head(2008) review 1467 estimates in 103 papers and show that the impact of distance has increased since the late 1980s.

For econometric estimations, the gravity model is expressed in log-linear form:

$$Ln\ X_{ij} = \beta_0 + \beta_1 Ln\ Y_i + \beta_2 Ln\ Y_j + \beta_3 Ln\ D_{ij} \qquad (2.2)$$

Additional measures of country size, such as population and GDP per capita are introduced. Population can be associated with a positive or negative impact on bilateral trade. Bergstrand (1989) and Baier and Bergstrand (2002) argue that a rise in population in both exporter and importer countries reduces the capital–labour endowment ratios of both countries. If exports are labour-intensive, then goods traded (relative to national outputs) should increase with an increase in population. On the other hand, if exports are capital-intensive, a higher population would be associated with lower trade (relative to national outputs). In addition, a larger population could mean a larger domestic market that is less dependent on international trade. Alternatively, GDP pre capita can be used to account for the fact that higher income countries tend to trade more. Time-invariant variables were added to the model to quantify for effects such as sharing the same border, language, and culture.[29] Sharing

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[28] Various literature have argued about the possible endogeneity between trade and output. Baier and Bergstrand (2005) argue that this issue can be ignored based on three issues. First, GDP is a function of net exports, not gross exports, which tend to be less than 5% of a country's GDP. Second, trade between two countries tend to be very small relative to a country's exports, which is much less than its GDP. Third, Frankel(1997) argue that the endogeneity of GDP makes little difference based on gravity model estimates using Instrumental variables.

[29] Mayer and Zignago(2005) perform a cross-section analysis data for 67 developing and

these common factors should improve communication and therefore reduce the cost of trade.

A dummy variable is added to the model to control for the fact that two countries belong to the same RTA, and to capture the effect of the RTA on trade. A positive and significant coefficient on the dummy indicates that members of the RTA are trading more with each other than they would have been without the RTA. A negative and significant value, on the other hand, indicates that members of the RTA are trading less with each other than would normally be expected. Aitken (1973) contributed first to using the gravity model to measure the effect of RTA when he analyzed the effect of the formation of the European Economic Community (EEC) and The European Free Trade Association (EFTA). Aitken (1973) included a dummy variable for each of the two agreements and found a positive and significant effect on intra-trade. In addition, Bergstrand(1985) , Thursby and Thursby (1987), Brada and M´endez (1988), and De Grauwe (1988) found evidence of trade creation associated with RTAs. Additional supporting evidence was provided by the later research of Frankel et al. (1995), Feenstra et al. (2001), Soloaga and Winters (2001), and Frankel and Rose (2002). Contrarily to these results, Ghosh and Yamarik (2004) apply extreme bounds analysis, and argue that the trade creation effect found in the gravity model literature is overstated.

Some of the research on RTA found little or no effect for RTA on trade, and, in some cases, a negative effect. Frankel (1997), for instance, found no trade effect associated with NAFTA, while Finger et al. (1998) found no effect from the MERCOSUR agreement on Caribbean Group for Cooperation on Economic Development (CGCED) countries' trade. Hassan (2001) found the SAARC bloc variable to be negative and significant, implying that the SAARC agreement had reduced trade between its members. Sharma and Chua (2000), in their study of trade in the ASEAN countries, found that ASEAN did not lead to an increase in intra-trade among members.

Recently, Baier and Bergstrand (2009) argue that the estimate of the RTA dummy in the gravity model might be fragile because it could represent unobserved

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developed countries over the period 1976-1999, and argue that the border effect accounts for the fact that the majority of internal demand is met by domestic producers, not foreign.

factors that are omitted and can bias estimates. To investigate this issue, they implement non-parametric estimates using matching econometrics of the long-run effects of RTA, and found a similar result to those returned by traditional parametric techniques. Therefore, they suggest that the gravity equation may still provide a baseline for evaluating the impact of RTA.

Early applications of the gravity model were criticized for having weak theoretical foundations. However, theoretical foundations were provided by a series of papers, beginning with Anderson (1979), who developed the model using both a Cobb-Douglas and a Constant Elasticity of Substitution (CES) utility function. He assumed that goods were differentiated by country of origin, and that there is an imperfect substitution. Similarly, Bergstrand (1985) derived the gravity model using CES preferences over domestic and importable goods, and found that importable goods are closer substitutes for each other than domestic goods. Bergstrand (1989) used the Dixit-Stiglitz assumption of product differentiation among firms. He derived the gravity model according to a two-sector economy in which each monopolistically competitive sector has a different factor proportion. He illustrated how the gravity model fits in with the Hechscher-Ohlin model of inter-industry trade.

Helpman and Krugman (1985) asserted that the theory behind comparative advantage does not agree with the empirical evidence in the gravity model. They found that income has no effect on the volume of trade and that countries trade more because of their similarity. Deardorff (1998) derived a form of the gravity model from two extreme cases of the Heckscher-Ohlin model. The first case assumes frictionless trade and the second case assumes goods are differentiated across countries. Anderson and Wincoop (2003) manipulated the CES expenditure system to derive an operational gravity model that enables easy estimations.

2.3.1.1 Recent Trends in Gravity Model Specifications

Most gravity model estimations over the last decade have involved using a cross-sectional method. However, there have been much criticisms that the use of a cross-sectional method can be subject to model misspecification, as it does not control for heterogeneous trading relationships (Egger and Pfaffermayr (2003); Cheng and Wall

(2005)). In terms of measuring the impact of RTA, Egger (2000) and Cheng and Tsai (2008) find regional coefficients to be overstated when unobserved heterogeneity is not accounted for.

Various forms have been applied to correct the model for efficient estimation. A better estimation is provided by the use of panel data methodology, especially with the availability of long-time series data. Using a panel approach offers various advantages, such as making it possible to capture the relevant relationships among variables over time in addition to identifying the role of the business cycle (Egger, 2000). In addition to increasing the degrees of freedom, it offers a solution to deal with the problem of bilateral (exporter-importer) heterogeneity.

In spite of the increased use of panel data in gravity model estimations, there is still no single estimation approach. Fixed effects and random effects models are used to capture individual effects across units. The fixed effect model assumes that explanatory variables are correlated with unobserved effects, while the random effect model assumes that there is no correlation between the explanatory variables and the unobserved effects. Egger (2000) argues that fixed effect models are preferable if the goal is to estimate the trade flow between a predetermined selection of nations. One advantage of fixed effect models is that they eliminate the need to include time-invariant variables, such as distance and the share border and/or common language, in addition to variables that are difficult to measure, such as non-tariff barriers. Many authors have recently recommended the fixed effect approaches when analyzing the impact of regional agreements on trade. For instance, Rose (2005) and Baier and Bergstrand (2007) argue that fixed effects or differencing approaches are best when dealing with the endogeneity problem in estimating the impact of trade agreements.

Different authors have introduced fixed effects with different approaches into the gravity model, which allow for monitoring possible unobservable effects to explain trade between two countries. Matyas (1997) argues that the correct econometric specification of the gravity model should take the form of a triple-index model. Time dummies are added to capture the globalization effect or the effect of the business cycle. In addition, each country has two effects, one as an exporter and one as an importer, which control for all time-invariant observable and unobservable country effects. Matyas's specification takes the following form:

$$Ln\ X_{ijt} = \alpha_i + \gamma_j + \lambda_t + \beta_1 Ln\ Y_{it} + \beta_2 Ln\ Y_{jt} + \beta_3 Ln\ D_{ij} + \ldots + u_{ijt} \qquad (2.3)$$

Where:

X_{ijt} is the volume of trade from country i to country j at time t;

Y_{it} & Y_{ij} are GDP for country i and country j at time t, respectively;

D_{ij} is the distance between country i and country j ;

α_i is the exporter country effect ;

γ_j is the importer country effect ;

λ_t is the time effect ;

u_{ijt} is a white noise disturbance.

In this estimation, the α_i , γ_j , λ_t specific effects are treated as random variables or fixed parameters. According to Matyas (1997), the exporter- and importer-specific parameter can be used to analyze the RTA effect. The exporter country effect works as an indicator of the relative efficiencies in exporting and the country's size. The importer country effect, on the other hand, measures the openness of the country to trade. When both parameters, exporter and importer, are large and significant for the RTA members relative to non-members, this would indicate a significant RTA effect.

To eliminate the fixed variables, Bayoumi and Eichengreen (1997) used a model based on differencing the dependent and independent variables, which Wooldridge (2002) argues is effective in the presence of serially correlated error terms. Cheng (1999) specified a country-pair effect between trading partners, which includes the effect of omitted variables that are cross-sectional specific but remain constant over time. Similarly, Egger and Pfaffermayr (2003) argue that there are possible interactions, which usually remain unobserved, between the exporter and the importer and are omitted when using the triple-index model. Omitting these interactions may yield biased estimates; therefore the proper econometric

specification should comprise both time and bilateral (country-pair) effects. The general model specification takes the following form:[30]

$$Ln\ X_{ijt} = \alpha + \lambda_i + \gamma_j + \theta_t + \delta_{ij} + \beta_1\ Ln\ Y_{it} + \beta_2\ Ln\ Y_{jt} + \ldots + u_{ijt} \qquad (2.4)$$

Where δ_{ij} is the bilateral (country-pair) effect between countries i and j, and with the following restrictions:

$\sum_i \alpha_i = 0$, $\sum_j \gamma_j = 0$, $\sum_t \lambda_t = 0$, and $\sum_{ij} \delta_{ij} = 0$ in the balanced case.

Egger and Pfaffermayr (2003) state that this generalized triple way specification is identical to a two-way model with time and bilateral effects only, which takes the following form:

$$Ln\ X_{ijt} = \alpha + \theta_t + \delta_{ij} + \beta_1 Ln\ Y_{it} + \beta_2 Ln\ Y_{jt} + \ldots + u_{ijt} \qquad (2.5)$$

The above specification controls for all time-invariant variables, such as distance, common border and language. The use of the distance variable was criticized, as it does not differentiate between land and sea transportation costs, and this specification offers the advantage of eliminating the need to include it.

Cheng and Wall (2005) compared different estimations of the gravity model, and conclude that using a country-pair fixed effect is preferred to other specifications. However, the fixed-effect approach does not allow for estimation of the coefficients of time-invariant variables such as language, common borders, etc. Baltagi *et al.*(2003) argue that research should control for as much heterogeneity as possible. They control for unobserved heterogeneity by controlling for exporter- and importer-specific time-variant.[31]

2.3.2   Application to the GCC

The gravity model applications to the GCC's bilateral trade are limited and take different directions concerning the GCC contribution to trade creation. Al Atrash and

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[30] It is possible for each bilateral effect to have two effects (two-way model), in which exports from country A to country B are different from exports of country B to country A. On the other hand, other research allowed for only one bilateral effect between two countries (one-way model).
[31] The specifications of Baltagi *et al.* (2003) have been applied in this paper, it generate a problem of over fitting as demonstrated by the insignificance and change in sign of the parameters.

Yousef (2000), using average level of trade between 1995-97, estimated that the GCC's RTA has not promoted greater integration among GCC members, and intra-trade is less than the model predicted. Al Hinai (2004) used dummy variables to represent intra-GCC trade, and GCC members' trade with non-members. These variables turned out to be negative and significant, indicating that GCC formation had not promoted an increase in trade, and that it had been a trade-diverting bloc.

On the other hand, Hassan and Antonie-Mehanna (2002) estimated that the GCC is a trade-creating bloc when analyzed in a Middle-Eastern framework. Bolbol et al. (2005) developed an augmented gravity model to assess the adequacy of Arab exports and to check the efficiency of Arab free trade arrangements. The model utilizes panel data over the period 1997-2003 with fixed-year effects, and finds that the GCC's RTA has a highly significant positive impact on trade.

However, the above studies suffer from model misspecification. None of the studies controlled for fixed effects, exporter, importer or bilateral, as suggested by Matyas (1997), Cheng (1999), and Egger and Pfaffermayr (2003), in order to avoid potentially biased estimation.

2.3.3 Data and estimations

This essay uses yearly data from 1980 to 2004. Values for the exports of the GCC are obtained from the United Nations database (UNComtrade), measured in US dollars.[32] Thirty-nine importing counties were chosen which were either major trading partners or had close regional or historical ties with the GCC countries.[33] Although some countries have been excluded due to absence data, this set of countries represents around 90 percent of total non-oil imports from the GCC.[34] The value of oil trade is excluded for three reasons. First, oil is the major export of GCC countries, but not among themselves. Second, the economic diversification from oil exports is one criterion for measuring the success of the GCC formation. Finally, oil is a primary and essential commodity that normally has different demand elasticity compared to non-oil products. The import value will be used instead of the export value, where the

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[32] Export values are based on traded commodities.
[33] List of countries is given in Appendix 2.A
[34] In order to allow for estimates with zero trade flows, a value of one is added to bilateral exports.

export of country A to country B will be estimated as the import of country B from country A. This method will be used for two reasons. First, there are many missing export data for GCC countries, but fewer missing values when using import data. Secondly, countries in general tend to report their imports more efficiently than their exports.[35]

To adjust for inflation during the sample period, the export values are converted into real values using the US GDP deflator for the year 2000.[36] GDP at constant US prices and population are from the World Bank database. The distance variable is obtained from Jon Haveman's website[37], and it is measured by great circular distance, in kilometers, between economic centers. Information on common languages and common borders are also obtained from Jon Haveman's website.

Different estimations of the gravity model will be applied for comparison purposes. These estimates will be based on: Gravity model specification with country-specific fixed effects, and specification with bilateral fixed effects. The gravity model with time- and country-specific fixed effects will be specified as:

$$
\begin{aligned}
Ln\,X_{ijt} = \alpha_0 + \theta_t + \delta_i + \gamma_j &+ \beta_1 Ln\,GDP_{it} + \beta_2\,Ln\,GDP_{jt} \\
&+ \beta_3 Ln\,POP_{it} + \beta_4 Ln\,POP_{jt} + \beta_5 Dist_{ij} + \beta_6 Language_{ij} \\
&+ \beta_7 Border_{ij} + \beta_8 GCC_{ijt} + u_{ijt}
\end{aligned} \tag{2.6}
$$

Where:

X_{ijt}	is the value of exports of country I to country j;
α_0	is the portion of the intercept that is common to all years and trading partners;
θ_t	is the time-specific effect that is common to all trading partners;
δ_i	is the exporter country effect ;
γ_j	is the importer country effect ;
$GDP_{it}\,\&\,GDP_{jt}$	are the real GDP for country i and country j at time t, respectively;

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[35] In order to apply the corresponding duty.

[36] Data on US GDP deflator are from the World Development Indicators (World Bank, 2006)

[37] www.macalester.edu/research/economics/PAGE/HAVEMAN/Trade.Resources/TradeData.html

POP_{it} & POP_{ji} are the populations in country *I* and country *j* at time *t*, respectively;

GCC_{ijt} is a dummy that takes the value of one when both countries are members of the GCC , and zero otherwise. The GCC dummy will take effect starting from 1983, the year which witnessed the establishment of the free trade area among GCC members.[38]

A second form of the gravity model with bilateral effect will be based on the following form:

$$Ln\ X_{ijt} = \alpha + \theta_t + \delta_{ij} + \beta_1 Ln\ GDP_{it} + \beta_2 Ln\ GDP_{jt} + \beta_3 Ln\ POP_{it}$$
$$+ \beta_4 Ln POP_{jt} + \beta_5 GCC_{ijt} + u_{ijt} \tag{2.7}$$

Where:

δ_{ij} is the bilateral effect, assuming a two-way model which states that $\delta_{ij} \neq \delta_{ji}$, while in the one-way model $\delta_{ij} = \delta_{ji}$.

In the two-way model, the effect of country pair is allowed to differ according to the direction of trade. In the one-way model, it is allowed to have the same effect on trade between a country pair regardless of the direction of trade. The argument for the two-way model is that transportation costs may differ depending on whether the countries are exporters or importers.

In terms of signs expectations, output size for trading partners is expected to have a positive impact on trade. Exporter's population is expected to be positive, while there is no prior expectation regarding importer's population. As discussed earlier, distance, which captures the impact of transportation costs, is certainly expected to be negative, while GCC, language and borders dummies are expected to have a positive impact.

In spite of the importance of exchange rates in the gravity model, they are not included, owing to the high degree of exchange rate stability among GCC countries over the past two decades. Exchange rates have been stable even during severe

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[38] Data on non-oil trade are not available before 1980, leaving 3 years of observations before the establishment of the GCC free trade area. Though this may raise concerns over the estimation of the GCC effect, an augmented estimate with lagged GCC dummy confirm the robustness of the estimate.

economic and political events, such as the fall of oil prices at the end of the 1980s, the invasion of Kuwait in 1990/1991 and the current political and civil instability in Iraq.

2.3.4   Results

All estimates are based on panel regression with heteroskedastic standard error. The results for the two specifications are reported in Table 2.1. The overall performance of both specifications shows very good results, where all of the explanatory variables are found to be highly significant. In terms of goodness of fit, 68 and 78 percent of the variation is described for the equations with importer/exporter and bilateral fixed effect respectively. The following is a detailed result for each specification.

2.3.4.1   Gravity Model with Country-Specific Fixed Effect

The results are reported in the first column of Table 2.1. Both exporter and importer countries' real GDP estimates are consistent with the basic hypotheses of the gravity model that predict a higher trade to be associated with larger economic size. For instance, a 1 percent increase in the exporter country's real GDP is associated with 1.41 percent more exports, while a 1 percent increase in the importer country's real GDP is associated with a 1.17 percent increase in exports.

The coefficient of the exporting country's population is positive and highly significant, where a 1 percent increase in the exporter's population is associated with 2.03 percent more trade. Such a positive effect may indicate that the GCC exports tend to be labour-intensive.[39] On the other hand, the coefficient of the importing country's population is negative and highly significant, indicating that partner countries tend to be less open to GCC's non-oil exports as they get larger. Probably, larger populations in importing countries indicate a more diversified economy that is less dependent on labour-intensive imports.

The coefficient of distance is highly significant and has the expected negative sign, which stresses the importance of geographical distance as a resistance factor in GCC's non-oil exports. In terms of value interpretation, a country will export 53

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[39] According to Bergstrand (1989) and Baier and Bergstrand (2002) , exporter population with positive (negative) sign indicates that exports tend to be labour- (capital) intensive.

percent less to a country that is twice as distant as another otherwise identical market. Common language and border dummies are highly significant and returned the expected positive sign. However, the language dummy's order of magnitude is not credible: sharing a common language is associated with a 2,233.6 percent = [(e$^{3.15}$ - 1)*100] increase in trade. These results suggest that cultural factors and geographical proximity are crucial factors in determining trade.

Regional blocs are expected to have a positive effect on intra-trade. However, the coefficient of the GCC dummy turned out to be negative and highly significant. Based on the estimation, the GCC countries tend to trade about 53 percent less among themselves than non-GCC trading partners during the 1980-2004 period. More explanation for this finding will be provided in section 2.4.

2.3.4.2   Gravity Model with bilateral fixed effect

The results are reported in the second column of Table 2.1. There is no major difference in terms of the sign and significance of the coefficients between this estimation and the previous estimation for equation (2.6). Controlling for bilateral effect improves the goodness of fit. The coefficient of GCC keeps its negative sign and is highly significant. According to the result, the GCC countries tend to trade 54.2 percent less among themselves than non-GCC trading partners. This stresses the assumption that the GCC countries had ineffective trading agreements during the period 1980-2004.

2.4   Sensitivity Analysis

The purpose of the analysis in this section is to explore some possible factors behind the GCC's negative effect on bilateral trade. One of the main arguments explaining the GCC pattern is the low level of economic diversification and high dependency on oil that causes almost all sectors to be linked directly or indirectly to the oil sector. In addition, GCC members usually produce similar products, and therefore compete with each other. As can be seen from Table 2.A.2 in appendix 2.A, the Oil and Gas sectors contribute highly to the GDP of GCC members. However, the majority of the intra-GCC trade involves trade from non-oil sectors. It is also important to consider the oil

exports, which can be seen as a competing segment with the non-oil exports. It is expected that, as the GCC members diversify their economies from oil, intra-trade in the GCC will probably increase.

In addition, the movement of oil prices might be a possible factor affecting bilateral trade, as the GCC countries are heavily dependent on oil exports. For instance, an increase in the price of oil may mean higher income from oil than income from non-oil products, therefore negatively affecting non-oil trade by shifting resources away from the non-oil industry.

It might also be possible that there is no immediate effect from the GCC agreement, where its impact may lag for many years. Frankel (1997), for instance, has suggested that there would be differences between the years when an agreement is drafted, when it goes into effect, and when the transition period of trade liberalization is completed.

The overall bilateral country size, similarity in country size, and differences in relative factor endowment are possible explanations for the bilateral trade behaviour as suggested by many authors such as Helpman and Krugman (1985) and Helpman (1987).[40] The gravity model can test the Heckscher-Ohlin theory which states that more differences in terms of factor endowments will translate into higher trade.[41] On the other hand, the Linder hypothesis can be tested; this assumes that countries with more similarity in terms of factor endowments and preferences would trade more.[42] The similarity in country size is expected to contribute to higher bilateral trade according to the new trade theory (NTT). In addition, it is expected that, as two countries' economic sizes increase, both their production capacities and size of markets would increase, which is then expected to help countries achieve economies of scale and increase their exports based on comparative advantage. The impact of these factors will be tested as an alternative to the exporter/importer's GDP and population.

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[40] Bergstrand (1990) supports the Linder hypothesis that higher differences in factor endowment are associated with lower trade.
[41] See Ghosh and Yamarik (2002).
[42] See Bergstrand (1990).

The sensitivity analysis in this section will perform three versions that will be applied to equations (2.6) and (2.7).[43] The first version aims to evaluate possible lagged impact of the GCC formation on trade. Three dummies representing 3 years', 7 years', and 12 years' lagged GCC membership will be applied, which will be represented as GCC_{ijt-86}, GCC_{ijt-90}, GCC_{ijt-95}.

The second version will include three variables that are directly related to oil prices and exports. The first two variables will be $\%\Delta Oil\,\text{Pr}ice_t$ and $\%\Delta OilExport_t$ which measure the yearly percentage change in real oil prices and yearly percentage change of oil exports respectively. The third variable will be $OIL/GDP_{i,t-1}$ which measures the one-year lag of the share of natural resources sector in GDP. These variables will be used to test for the possible effects on non-oil exports from the GCC. All variables are based on log-transformed values and are expected to have a negative effect on non-oil exports.

The third version will follow a similar approach to Baltagi *et al.*(2003), and control for the countries similarity in size ($Simi_{ijt}$), differences in relative factor endowment (RFE_{ijt}) and overall bilateral country size ($Size_{ijt}$), where:

$$
Simi_{ijt} = \ln\left[1 - \left(\frac{GDP_{it}}{GDP_{it} + GDP_{jt}}\right)^2 - \left(\frac{GDP_{jt}}{GDP_{it} + GDP_{jt}}\right)^2\right]
$$

$$
RFE_{ijt} = \ln\left|GDPC_{it} - GDPC_{jt}\right|
$$

$$
Size_{ijt} = \ln\left(GDP_{it} + GDP_{jt}\right)
$$

Each of the above variables will also be interacted with the GCC dummy in order to measure their effect on trade among the GCC countries. It would be expected that higher trade among GCC countries would be associated with higher differences in relative factor endowments, more similarities in relative size, and higher overall bilateral country size.

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[43] Both equations will be modified to fit the new variables.

The results after including these variables are presented in Table 2.2. The first version which controls for lagged impact of GCC formation is displayed on the first and fifth columns. The GCC and lagged dummies, except the one representing 7 years' lag, turned negative for both models. The main GCC dummy is only significant for the regression in the fifth column, while the GCC lags are significant for 3 and 12 years' lags. Overall, the GCC membership is still associated with negative impact on the members' bilateral trade despite controlling for lagged effect of membership.

Estimates for the second version, columns 2 and 6, retained the expected negative signs. The share of the oil sector in GDP turns out to be negative and highly significant for both equations, where a higher oil share in output is associated with lower non-oil exports in the following year. For the variable measuring the effect of changes in oil prices, the result is not robust as it is only significant for the estimate in column 2. In terms of oil exports, the results turned significant in both equations, indicating that oil-related exports grew at the expense of non-oil exports. The GCC regional dummy retained a very similar impact from the regressions in Table 2.1.

The regression estimates of the final version are shown in columns 3, 4, 7 and 8. All estimates retained positive and highly significant impacts for the countries' similarity in size which is in line with the NTT. The overall bilateral country size also confirms earlier support for the positive role of economic size. Keeping other variables constant, higher non-oil exports from the GCC would be associated with higher overall economic size and higher similarity between partners' GDPs.

However, the results provide weak evidence for the role of differences in relative factor endowments which returned different signs when controlling for the country-specific and bilateral fixed effect. Higher differences in relative factor endowments turned positive and highly significant in columns 3 and 4, supporting the Heckscher-Ohlin theory that more difference in terms of factor endowments will translate into higher trade. On the other hand, it returned as negative in columns 7 and 8, supporting the Linder hypothesis which assumes that countries with similar factor endowments would have higher trade. As in the earlier estimates, the GCC regional dummy is negative and highly significant.

Among the estimates in columns 4 and 8 that control for interaction with the GCC dummy, only the variable that measures the overall bilateral country size returned a robust negative and significant sign. The interpretation is that non-oil trade among the GCC is higher as the partners' overall relative size falls, which is unexpected. One possible explanation is that the limited number of GCC members, consisting of large and small economies, may not capture the right impact of size. Though not significant in column 4, differences in relative factor endowments returned the expected positive sign which is in support of the Heckscher-Ohlin theory, indicating that trade between GCC countries would increase with higher difference in their factor endowments. Overall, the impact of the GCC membership turned out to be robust as it returned the same association with lower trade among the GCC countries.

2.5   Conclusion

The GCC countries, with abundant natural resources, have been pursuing economic integration since 1981 with the goal of establishing a single currency by 2010. Although one of the main goals of GCC formation was to motivate bilateral trade, the intra-regional trade share remains small, roughly accounting for about 6 percent of total trade, as oil is the GCC countries' major export to the world, but not among themselves. Therefore, an optimistic approach has been to look at intra-regional (non-oil) trade, which accounts for more than 80 percent of total trade within the GCC region.

Apart from Saudi Arabia, a rang between 20 percent- 45 percent of the GCC members' non-oil exports are traded within the GCC. Geographical proximity, especially sharing a common border, is a significant factor in trade between members, where almost all GCC members trade the most with one or two members who share the same border. Unlike the GCC's total exports, which are highly correlated with the movement of oil prices, the GCC's non-oil exports are not affected by the fall in oil prices. This suggests that the more the GCC members further increase the share of non-oil exports, the less their economies are hurt by oil price fluctuations.

This essay has addressed the effects of GCC formation on intra-regional trade, non-oil trade in particular, applying the gravity model of bilateral trade flows to a set

of panel data for the period 1980-2004. Despite the GCC membership that is expected to promote intra-regional trade, the results show that GCC members tended to trade about 54 percent less among themselves than with non-GCC trading partners. This might suggest that the GCC countries had ineffective trading agreements during the study period.

One of the main arguments explaining GCC trade patterns is the low level of economic diversification from oil and gas production. In addition GCC members usually produce similar products, and therefore compete with each other. In addition, GCC members are considered open economies in terms of trade; therefore GCC's products face competition with global products that are based on comparative advantage and economies of scales. With the inclusion of new variables related to the oil sector, the share of oil and gas in GDP, and changes in oil prices and oil exports, the gravity model shows that they are all associated with lower non-oil exports. Higher differences in terms of factor endowments show a potential association with higher trade among the GCC countries, while lack of commitment among members in following the timeframe of the customs union and common market may have contributed to the lower trade associated with the GCC.

Despite the lower trade among the GCC, fostering the integration process with the goal of having a common currency is expected to help maximize the economic gains from the regional integration, and lead to further and more effective economic diversification. A common currency will obtain more durable commitment and eliminate any exchange rate fluctuations among members and the transaction costs associated with them, thus helping to increase trade. According to the endogenous Optimum Currency Area (OCA) argument, adoption of a single currency will be followed by an increase in trade. Frankel and Rose (1997 ,(1998), 2000) show that monetary integration leads to a significant increase in bilateral trade.

Upon the availability of data, future research should investigate the impact of the customs union and the common market in 2003 and 2008 respectively. Another potential area for future research is to investigate the role of the governments' sector, whose contribution is highly correlated with changes in oil prices. Capital markets are another channel that may have an impact on non-oil exports and it would be interesting to investigate their role.

Table 2.1: Regression results for GCC's non-oil exports volumes

Explantory variables	Exporter/Importer effects	Bilateral fixed effect
Exporter GDP	1.416 (0.289)***	1.476 (0.262)***
Importer GDP	1.17 (0.237)***	1.132 (0.203)***
Exporter's Population	2.03 (0.212)***	2.0 (0.19)***
Importer's Population	-0.703 (0.245)***	-0.662 (0.2)***
GCC	-0.758 (0.238)***	-0.78 (.018)***
Distance	-0.531 (0.10)***	---
Language	3.15 (0.393)***	---
Border	0.646 (0.111)***	---
Observations	5243	5243
R-squared	0.68	0.764

Note:*** represent significance at 1% level. Robust standard error between parentheses.

Table 2.2: Sensitivity results for GCC's non-oil export volumes

Explanatory variables	Exporter/Importer fixed effects				Bilateral fixed effect			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Exporter GDP	1.41	1.63	--	--	1.47	1.69	--	--
	(0.29)***	(0.188)***			(0.262)***	(0.273)***		
Importer GDP	1.06	1.16	--	--	1.03	1.13	--	--
	(0.241)***	(0.18)***			(0.207)***	(0.203)***		
Exporter's Population	2.05	1.86	--	--	2.02	1.83	--	--
	(0.211)***	(0.228)***			(0.189)***	(0.208)***		
Importer's Population	-0.27	-0.705	--	--	-0.2	-0.665	--	--
	(0.31)	(0.27)***			(0.258)	(0.199)***		
Distance	-0.53	-0.53	-0.51	-0.48	--	--	--	--
	(0 .1)***	(0.127)***	(0.106)***	(0.106)***				
Language	3.54	3.11	3.5	3.5	--	--	--	--
	(0.421)***	(0.392)***	(0 .310)***	(0.31)***				
Border	0.64	0.65	0.70	0.829	--	---	--	--
	(0.111)***	(0.128)***	(0.151)***	(0.152)***				
GCC	-.432	-0.75	-0.97	--	-0.45	-0.77	-1.23	--
	(0.274)	(0.236)***	(0.215)***		(0.202)**	(0.179)***	(0.172)***	
GCC$_{ij\,86}$	-0.51	--	--	--	-0.50	--	--	--
	(0.204)***				(0.142)***			
GCC$_{ijt90}$	0.053	--	--	--	0.06	--	--	--
	(0.138)				(0.09)			
GCC$_{ijt95}$	-0.26	--	--	--	-0.30	--	--	--
	(0.107)**				(0.079)***			
Oil/GDP$_{t-1}$	--	-0.51	--	--	--	-0.50	--	--
		(0.176)***				(0 .172)***		
% ▲Oil-Price	--	-0.052	--	--	--	-0.017	--	--
		(0.01)***				(0.017)		
% ▲Oil Exports		-0.014		--		-0.013	--	--
		(0.005)***				(0.006)**		

Continues on next page

Table 2.2 (continues). Sensitivity results for GCC's non-oil export volumes

Explanatory variables	Exporter/Importer fixed effects				Bilateral fixed effect			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Sum of GDPs	--	--	2.53	2.48	--	--	2.32	2.32
			(0.388)***	(0.389)***			(0.344)***	(0.348)***
Factor Endowment	--	--	0.25	0.235	--	--	-0.34	-0.361
			(0.072)***	(0.077)***			(0.106)***	(0.110)***
Similarity Index	--	--	1.26	1.21	--	--	2.18	2.19
			(0.205)***	(0.206)***			(0.304)***	(0.305)***
GCCxSum of GDPs	--	--	--	-0.027	--	--	--	-0.087
				(0 .011)***				(0.013)***
GCCxFactor Endowment	--	--	--	0.2	--	--	--	0.343
				(.144)				(0.176)***
GCCx Similarity Index	--	--	--	0.39	--	--	--	-0.572
				(0.093)***				(0.203)***
Observations	5243	5242	5243	5243	5243	5243	5243	5243
R-squared	0.68	0.68	0.68	0.68	0.765	0.77	0.765	0.76

Note: *** and ** represent significance at 1% & 5% level, respectively. Robust standard error between parentheses.

Figure 2.1: Sources of non-oil exports, Bahrain 1980

4.91%
3.16%
10.86%
55.47%
25.59%

□ Manufactured goods classified chiefly by material ■ Miscellaneous manufactured articles
□ Machinery and transport equipment □ Crude materials, inedible, except fuels
■ Other commodities
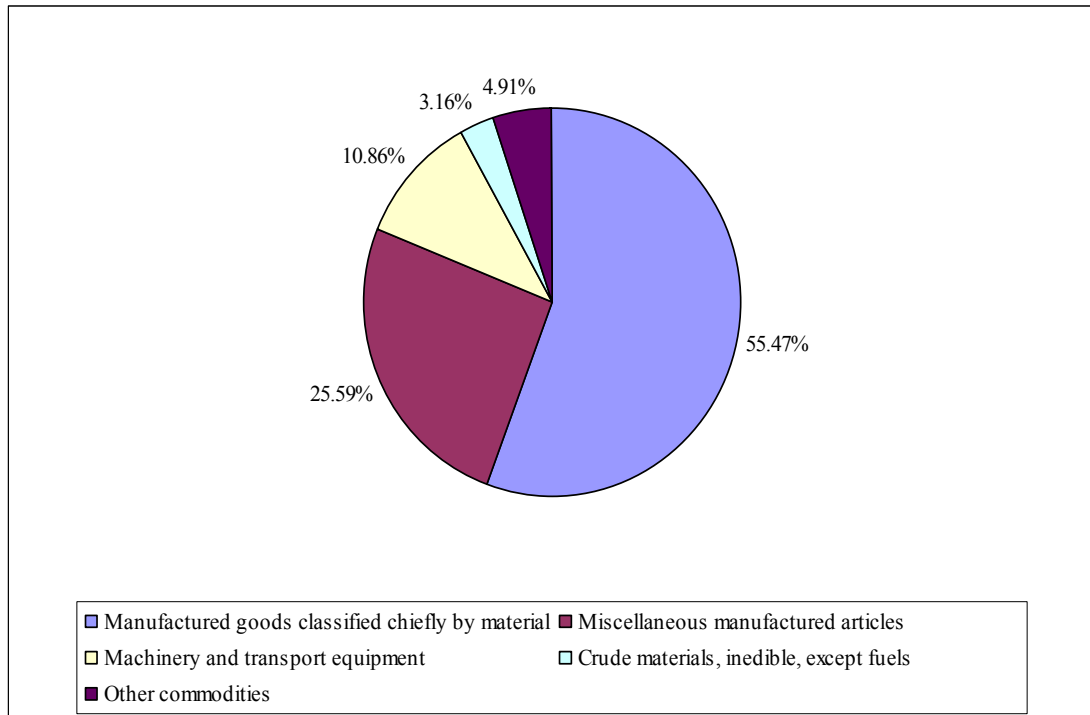
Source: United Nation Statistics (UNCOMTRADE), 2006

Figure 2.2: Sources of non-oil exports, Bahrain 2004

11.23%
7.92%
9.06%
58.89%
12.90%

□ Manufactured goods classified chiefly by material ■ Miscellaneous manufactured articles
□ Chemicals □ Crude materials, inedible, except fuels
■ Other commodities
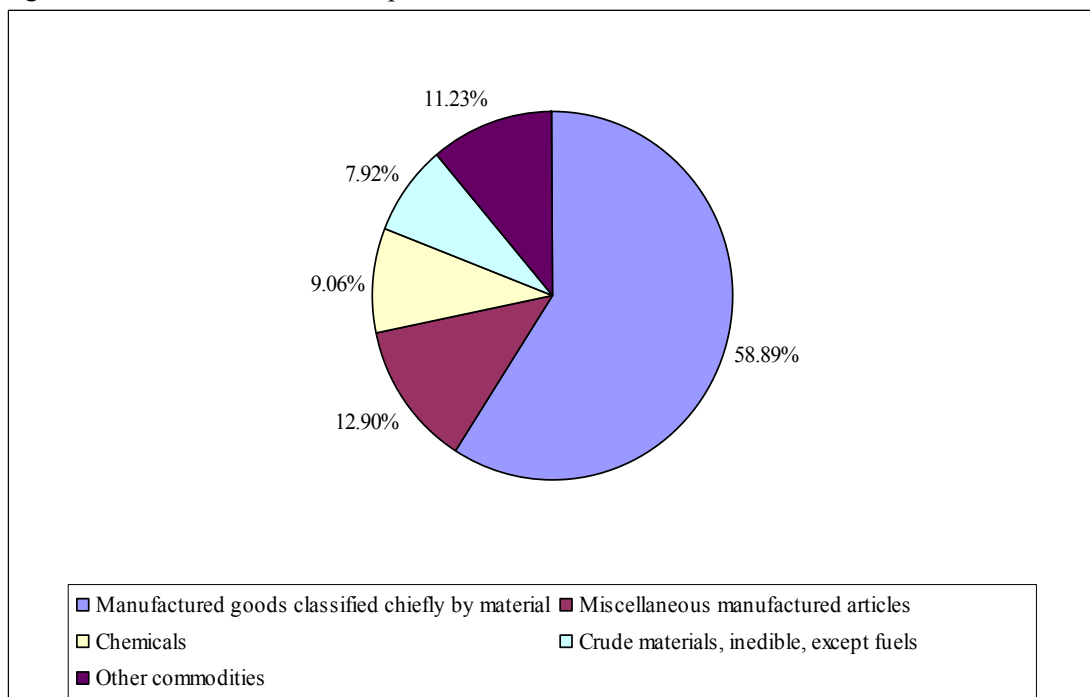
Source: United Nation Statistics (UNCOMTRADE), 2006

Figure 2.3: components of non-oil exports, Kuwait 1980

Legend:
- Manufactured goods classified chiefly by material
- Chemicals
- Machinery and transport equipment
- Crude materials, inedible, except fuels
- Other commodities
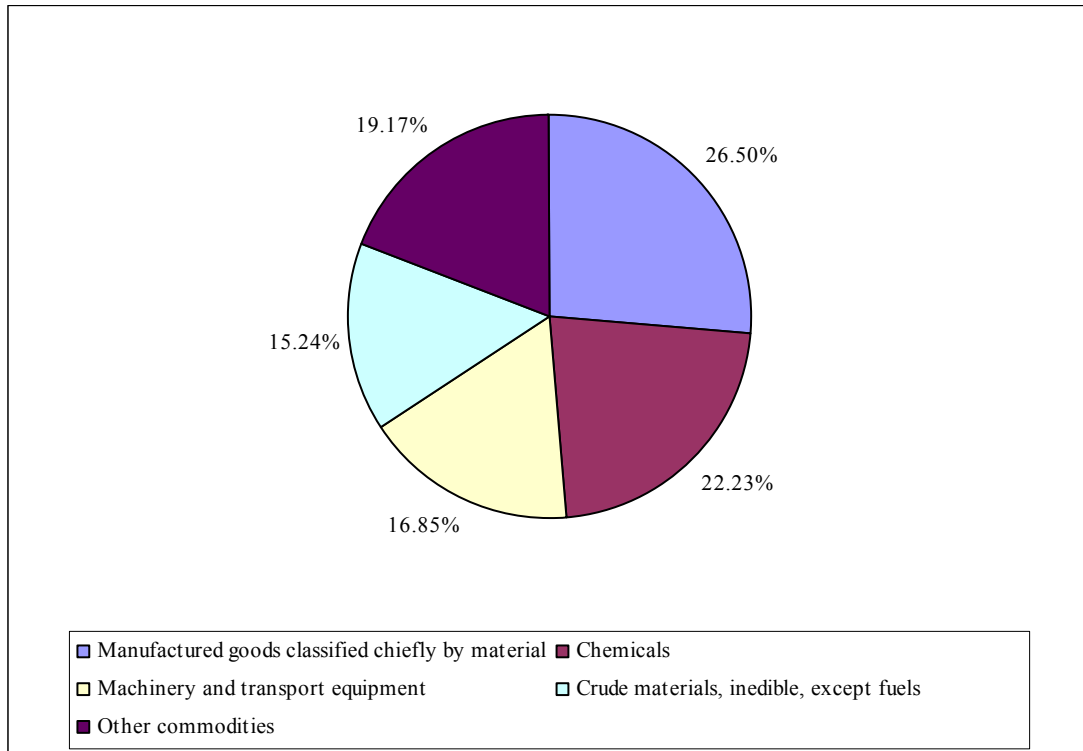
Source: United Nation Statistics (UNCOMTRADE), 2006

Figure 2.4: components of non-oil exports, Kuwait 2004

Legend:
- Chemicals
- Manufactured goods classified chiefly by material
- Crude materials, inedible, except fuels
- Machinery and transport equipment
- Other commodities (inside selection)
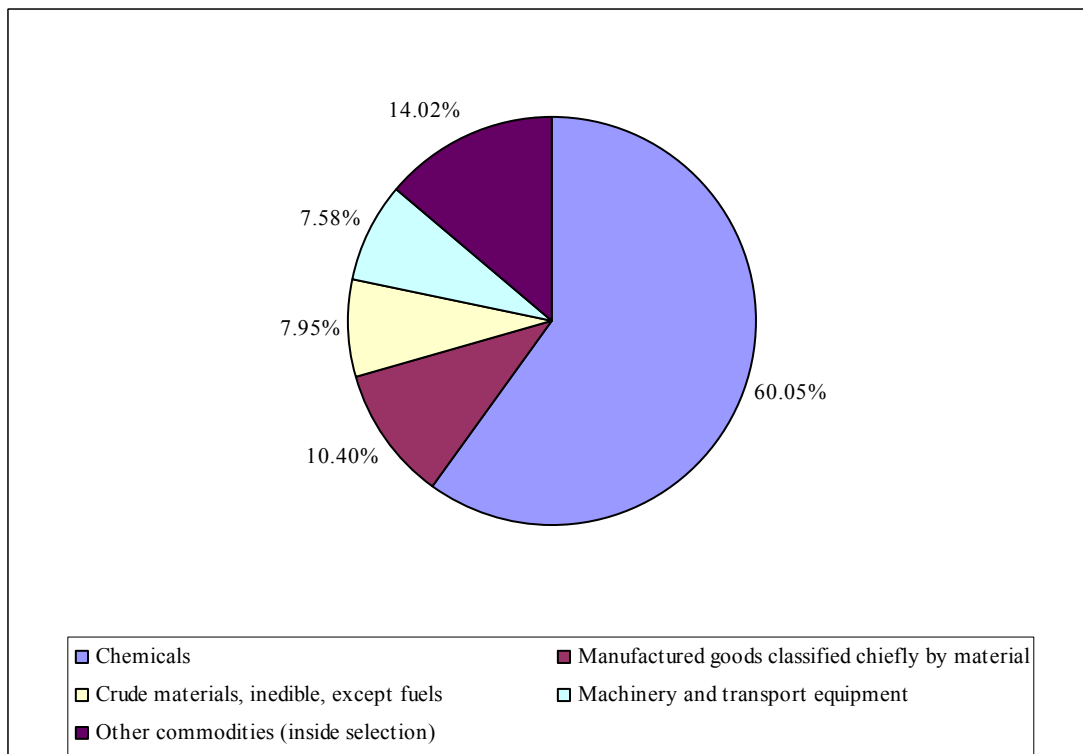
Source: United Nation Statistics (UNCOMTRADE), 2006

Figure 2.5: components of non-oil exports, Oman 1980

5.10%
3.01%
8.52%
12.47%
70.89%

- Machinery and transport equipment
- Miscellaneous manufactured articles
- Food and live animals
- Manufactured goods classified chiefly by material
- Other commodities
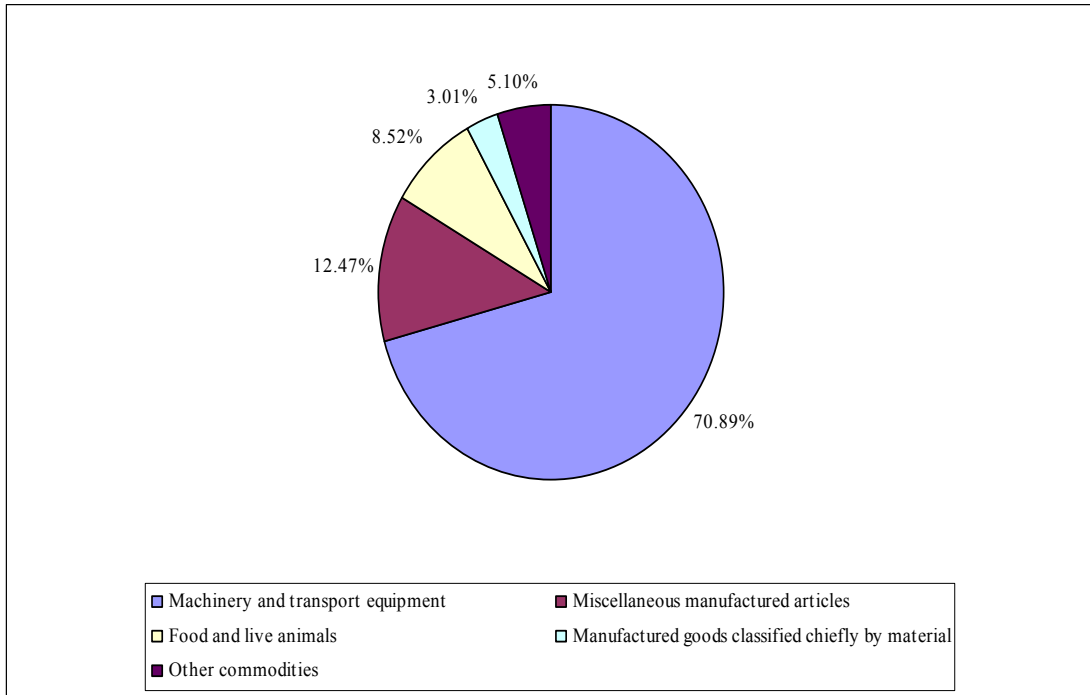
Source: United Nation Statistics (UNCOMTRADE), 2006

Figure 2.6: components of non-oil exports, Oman 2004

21.36%
30.04%
13.22%
18.01%
17.37%

- Miscellaneous manufactured articles
- Manufactured goods classified chiefly by material
- Food and live animals
- Machinery and transport equipment
- Other commodities
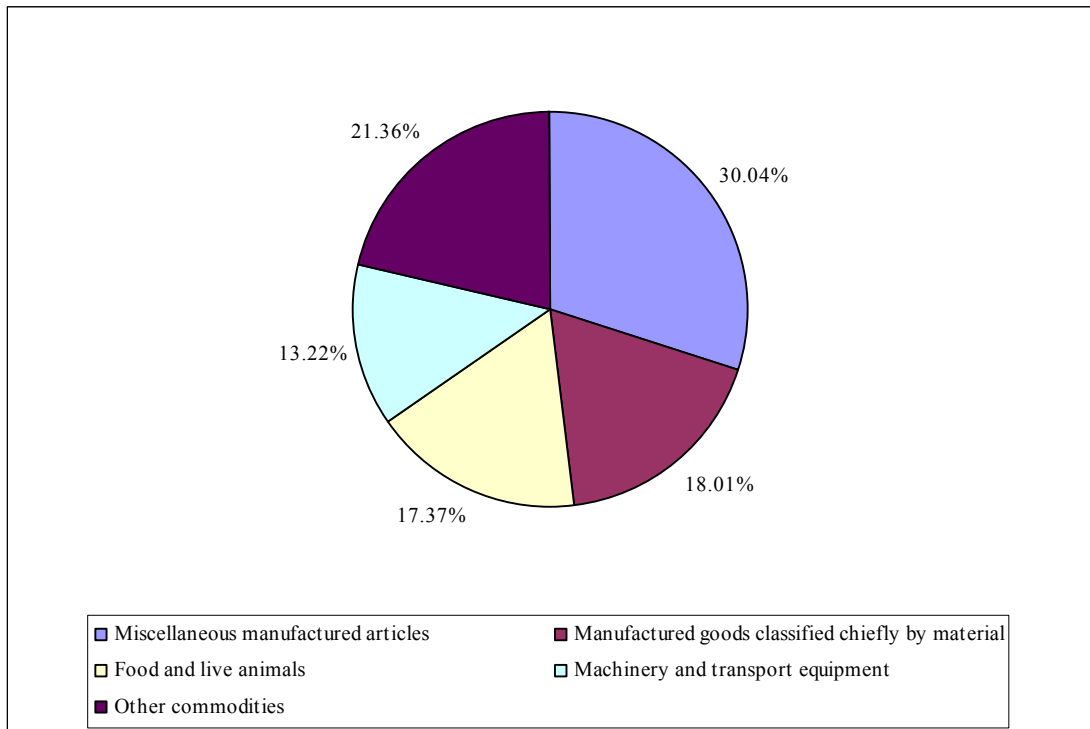
Source: United Nation Statistics (UNCOMTRADE), 2006

Figure 2.7: components of non-oil exports, Qatar 1980

2.29%
1.22%
5.82%
32.14%
58.52%

- Manufact goods classified chiefly by material
- Chemicals
- Machinery and transport equipment
- Miscellaneous manufactured articles
- Other commodities
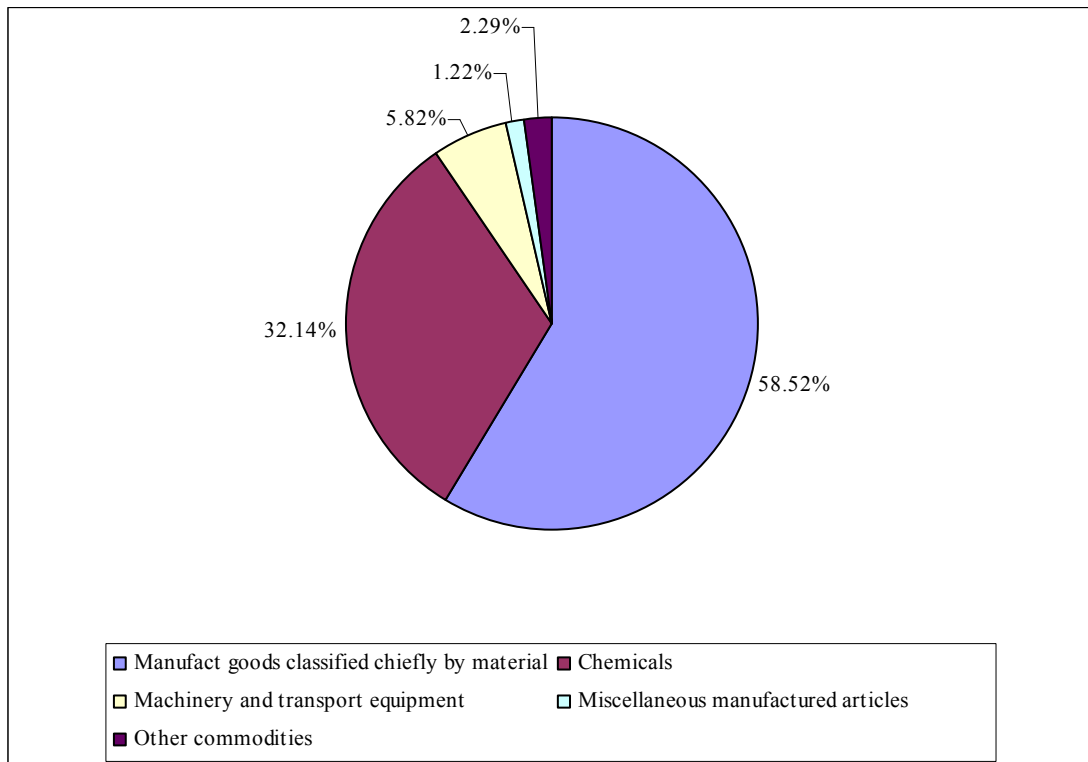
Source: United Nation Statistics (UNCOMTRADE), 2006

Figure 2.8: components of non-oil exports, Qatar 2004

6.10%
4.11%
8.14%
11.17%
70.48%

- Chemicals
- Miscellaneous manufactured articles
- Manufact goods classified chiefly by material
- Commod. & transacts. Not class. Accord. To kind
- Other commodities
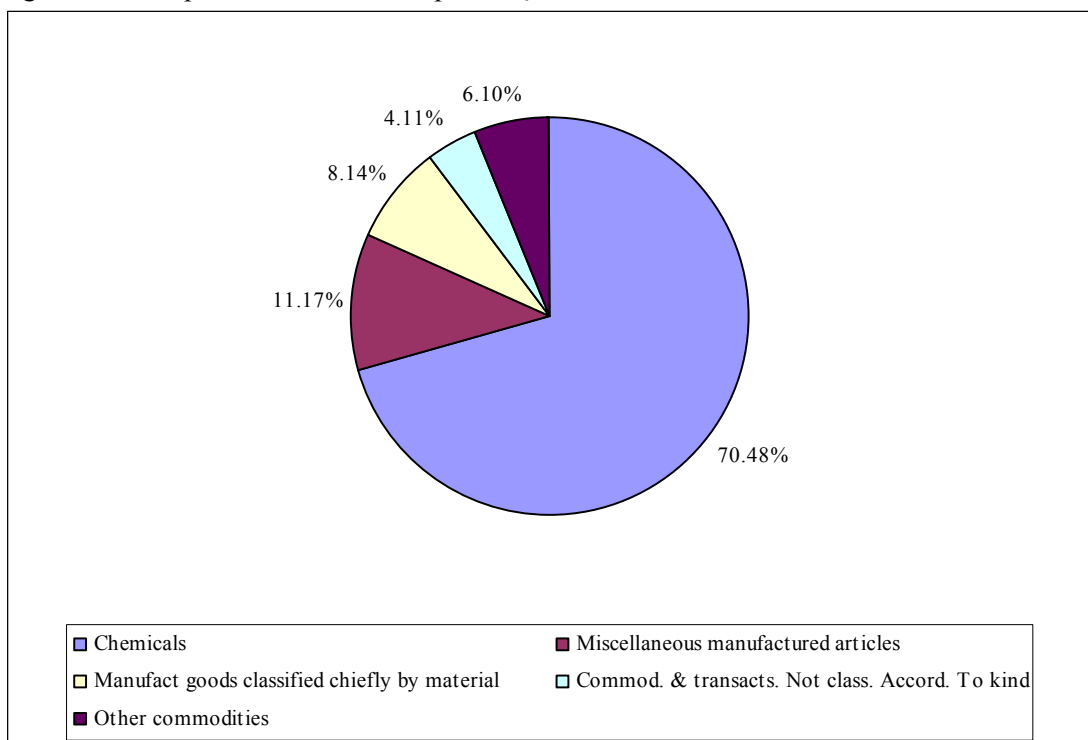
Source: United Nation Statistics (UNCOMTRADE), 2006

Figure 2.9: components of non-oil exports, Saudi Arabia 1980

15.51%
8.88%
9.07%
54.13%
12.41%

■ Machinery and transport equipment   ■ Chemicals
□ Miscellaneous manufactured articles   □ Commod. & transacts. Not class. Accord. To kind
■ Other commodities
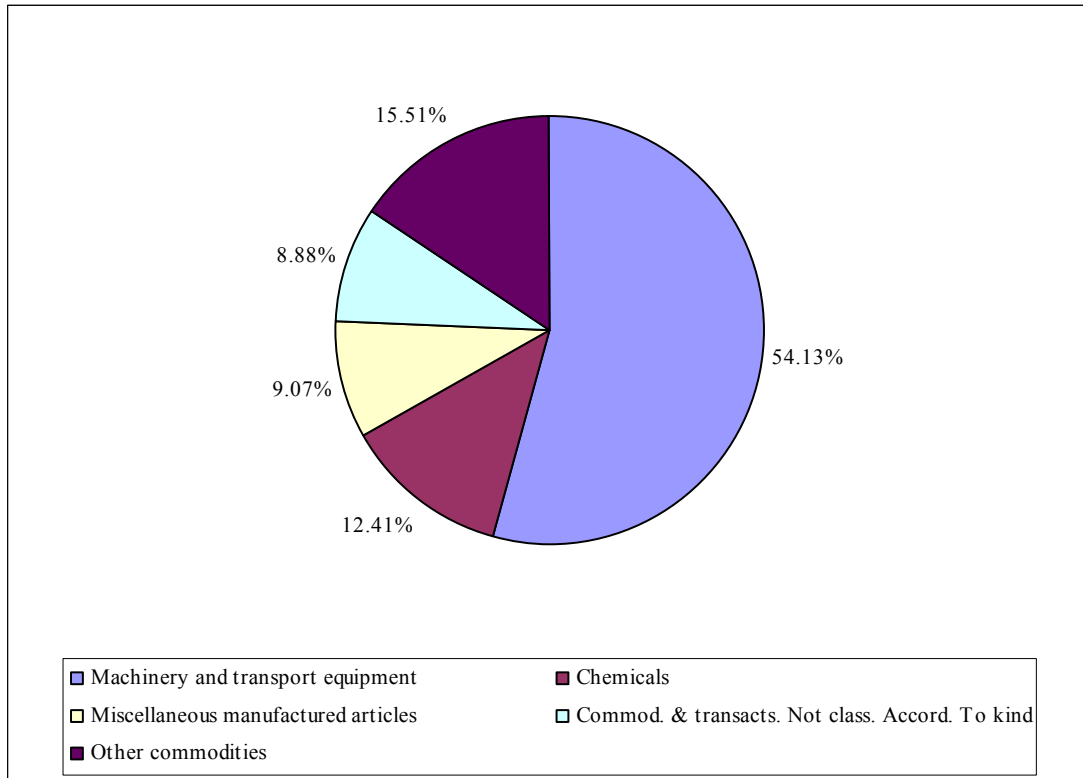
Source: United Nation Statistics (UNCOMTRADE), 2006

Figure 2.10: components of non-oil exports, Saudi Arabia 2004

9.22%
3.85%
5.81%
11.66%
69.46%

□ Chemicals   ■ Manufactured goods classified chiefly by material
□ Machinery and transport equipment   □ Crude materials, inedible, except fuels
■ Other commodities
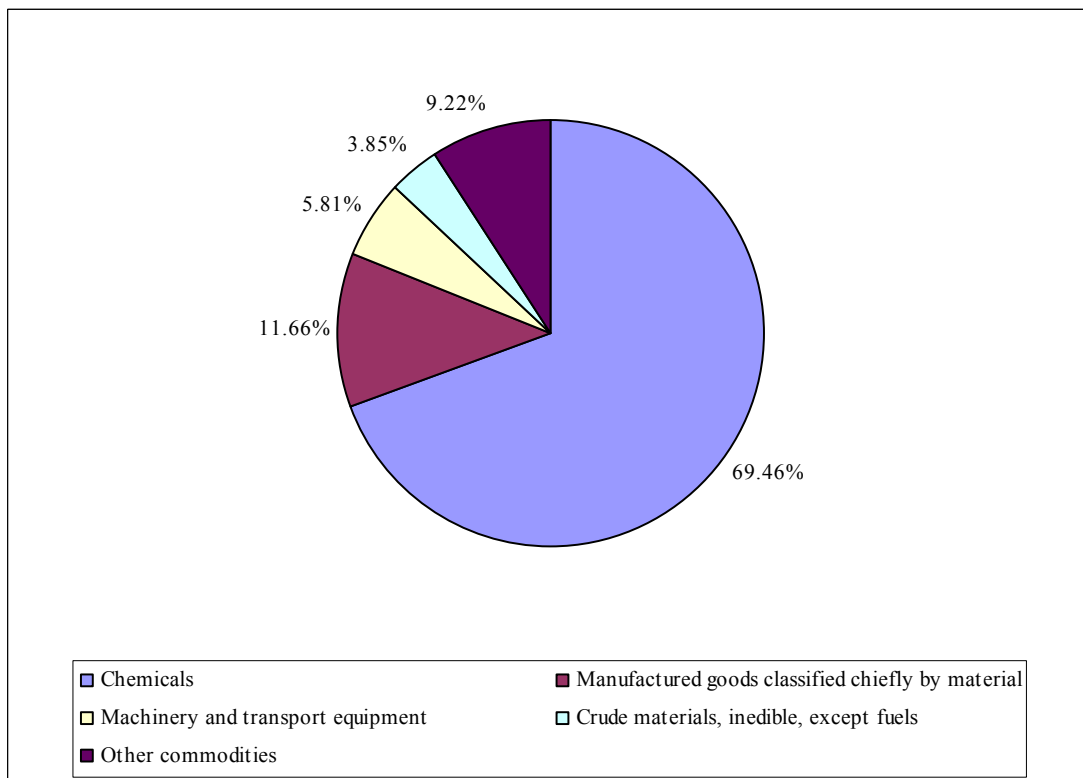
Source: United Nation Statistics (UNCOMTRADE), 2006

Figure 2.11: components of non-oil exports, UAE 1980

13.92%

7.98%

8.10%

12.25%

57.76%

- Manufactured goods classified chiefly by material ■ Machinery and transport equipment
- Food and live animals □ Miscellaneous manufactured articles
- Other commodities
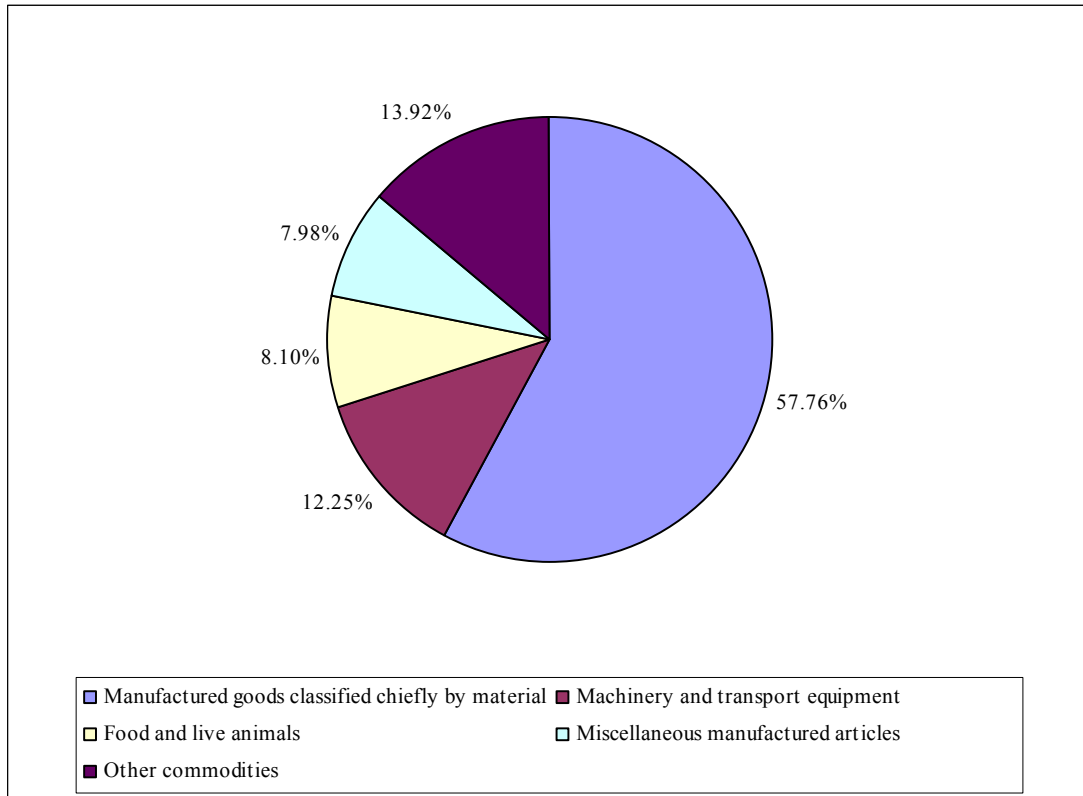
Source: United Nation Statistics (UNCOMTRADE), 2006

Figure 2.12: components of non-oil exports, UAE 2004

15.71%

9.82%

10.16%

34.19%

30.12%

- Manufactured goods classified chiefly by material ■ Machinery and transport equipment
- Chemicals □ Miscellaneous manufactured articles
- Other commodities
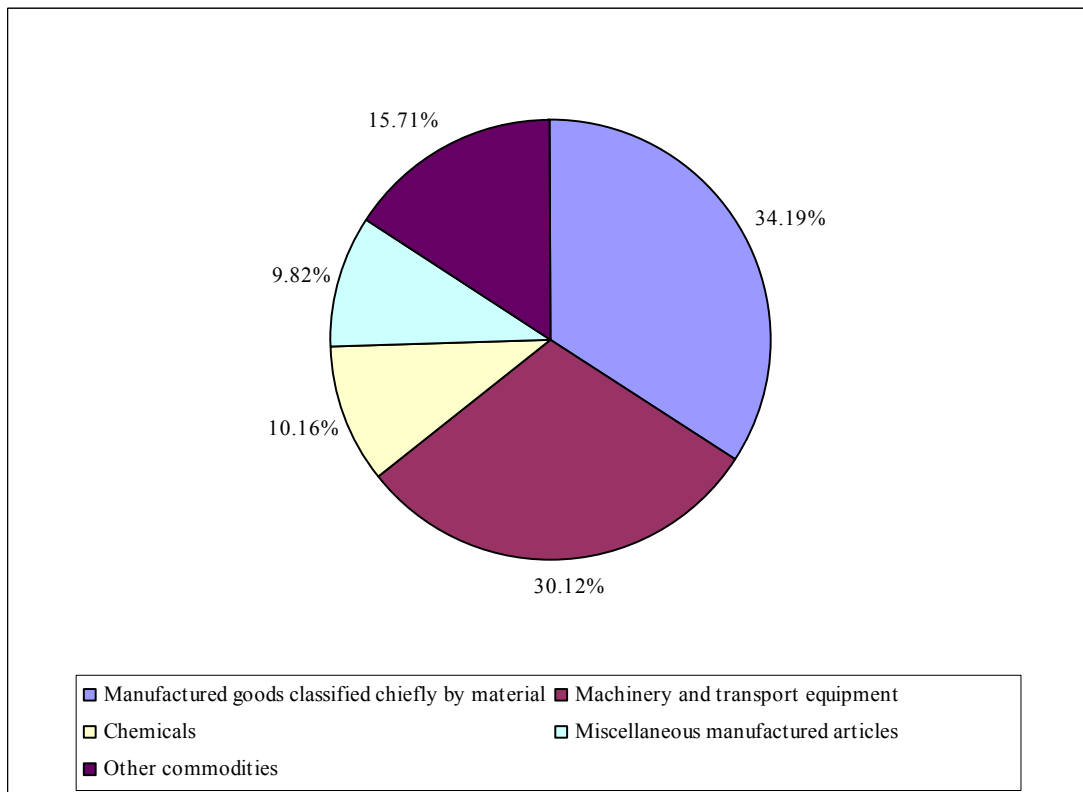
Source: United Nation Statistics (UNCOMTRADE), 2006

Figure 2.13: Bahrain's non-oil exports (US$)
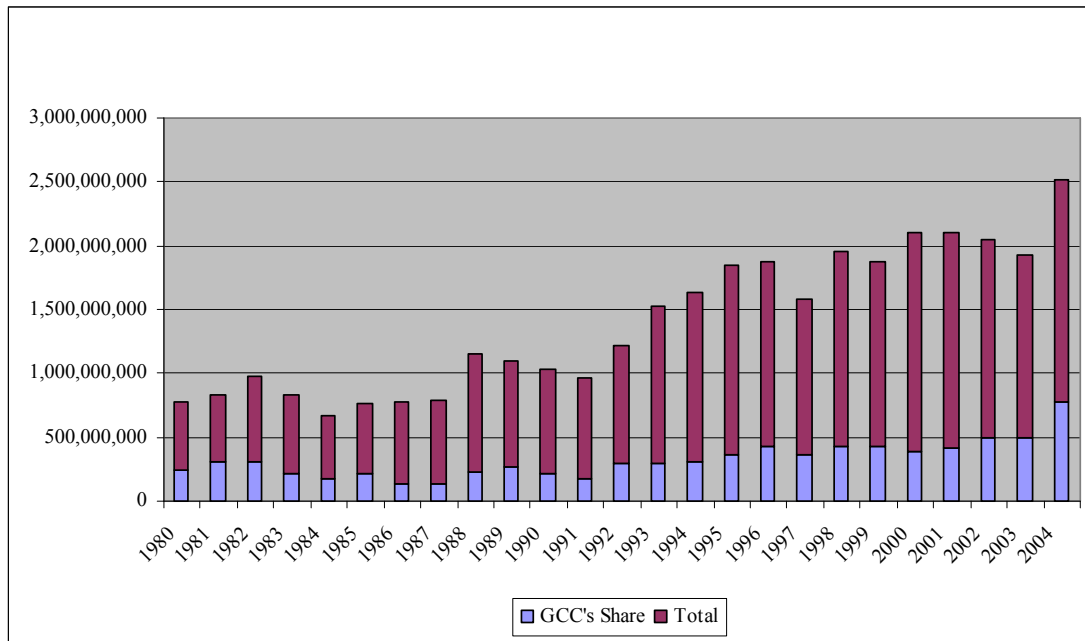
Figure 2.14: Kuwait's non-oil exports (US$)
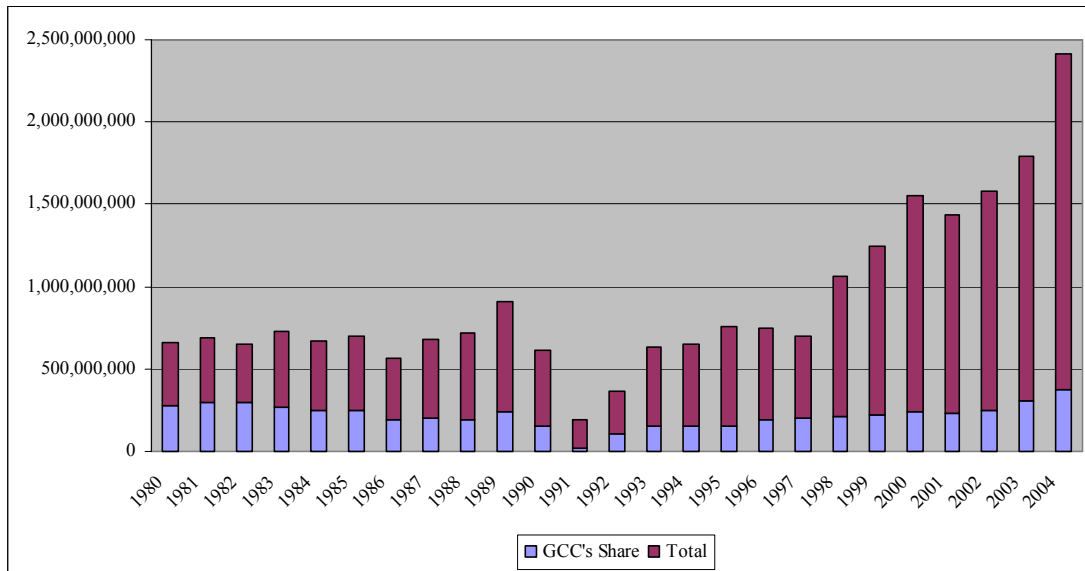
Figure 2.15: Oman's non-oil exports (US$)
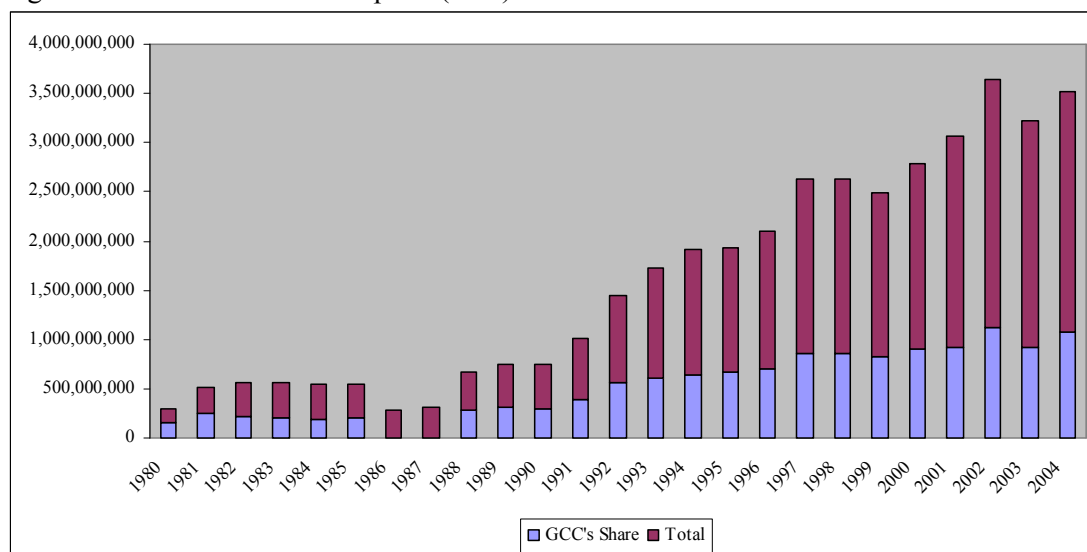
Figure 2.16: Qatar's non-oil exports (US$)
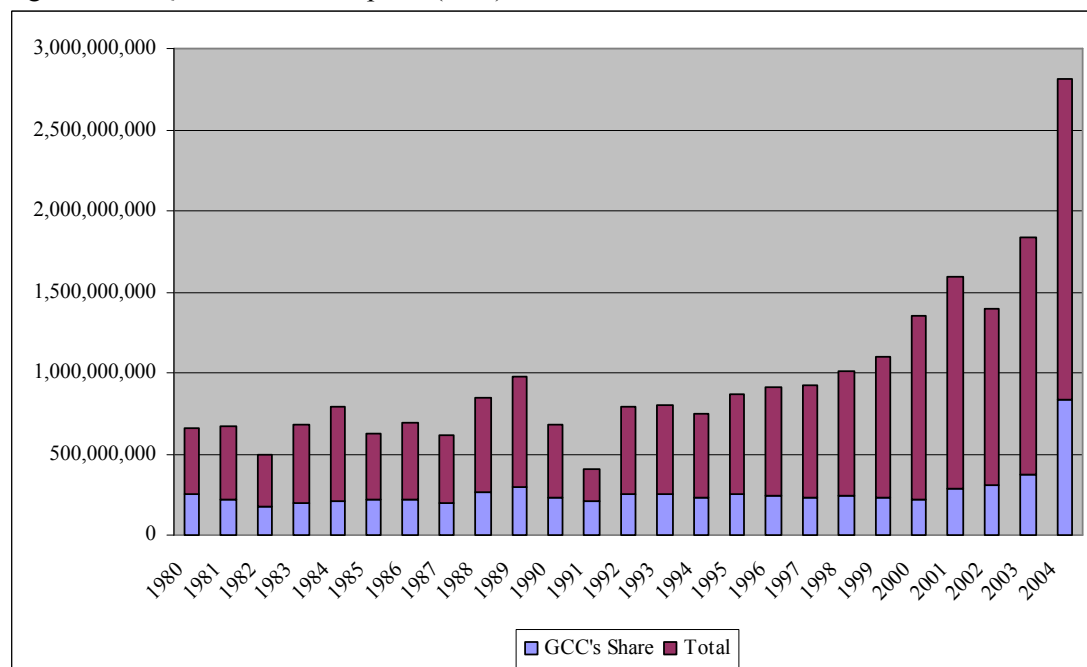
46

Figure 2.17: Saudi Arabia's non-oil exports (US$)
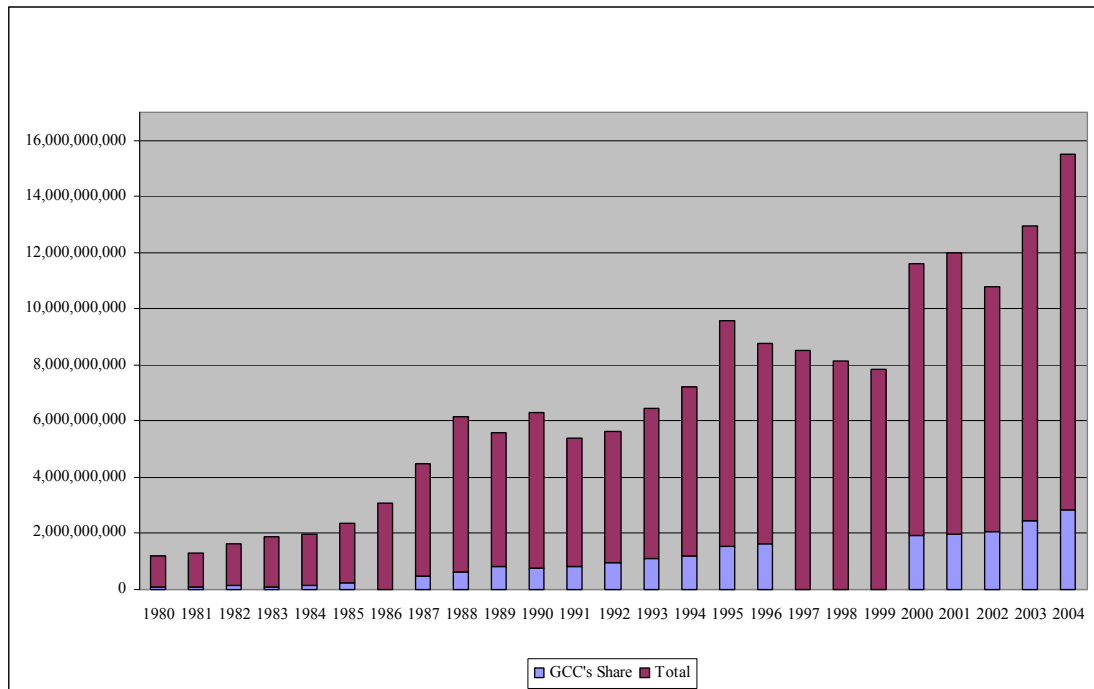
Figure 2.18: UAE's non-oil exports (US$)
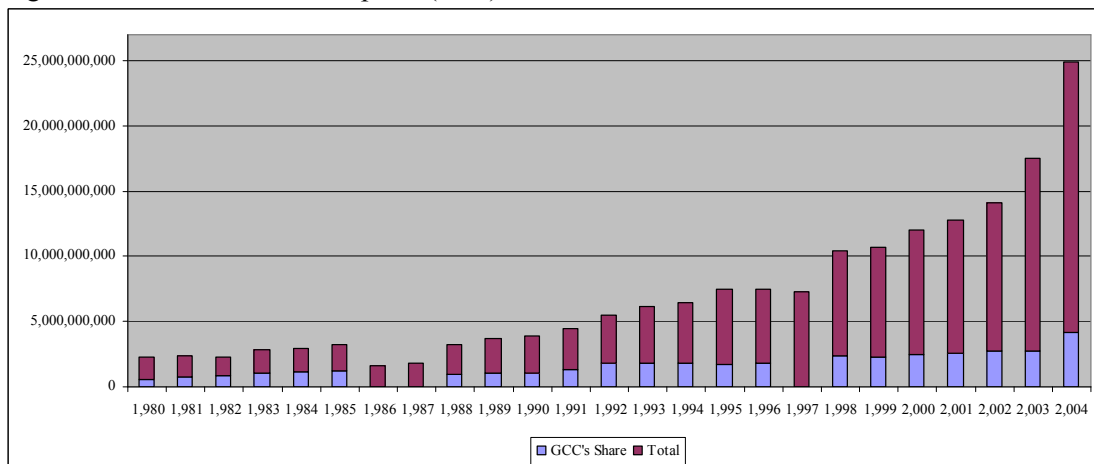
Figure 2.19: Ratios of oil and non-oil exports relative to total exports, Bahrain 1980

non oil, 13.43%

Oil, 86.57%
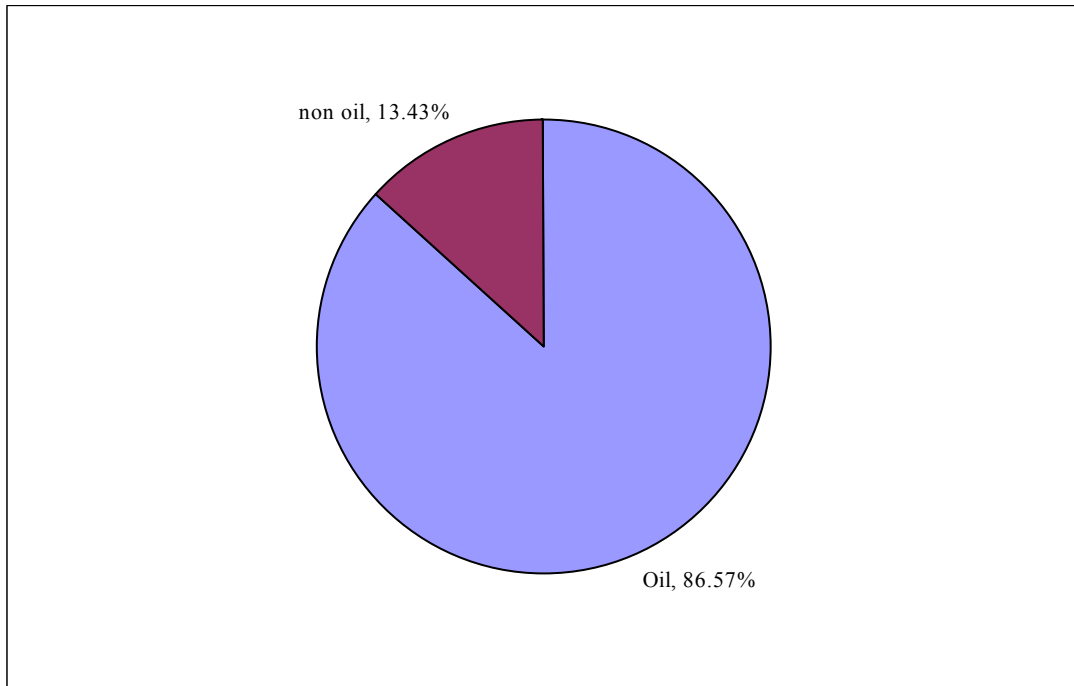
Figure 2.20: Ratios of oil and non-oil exports relative to total exports, Bahrain 2004

Oil, 45.82%

non oil, 54.18%

48
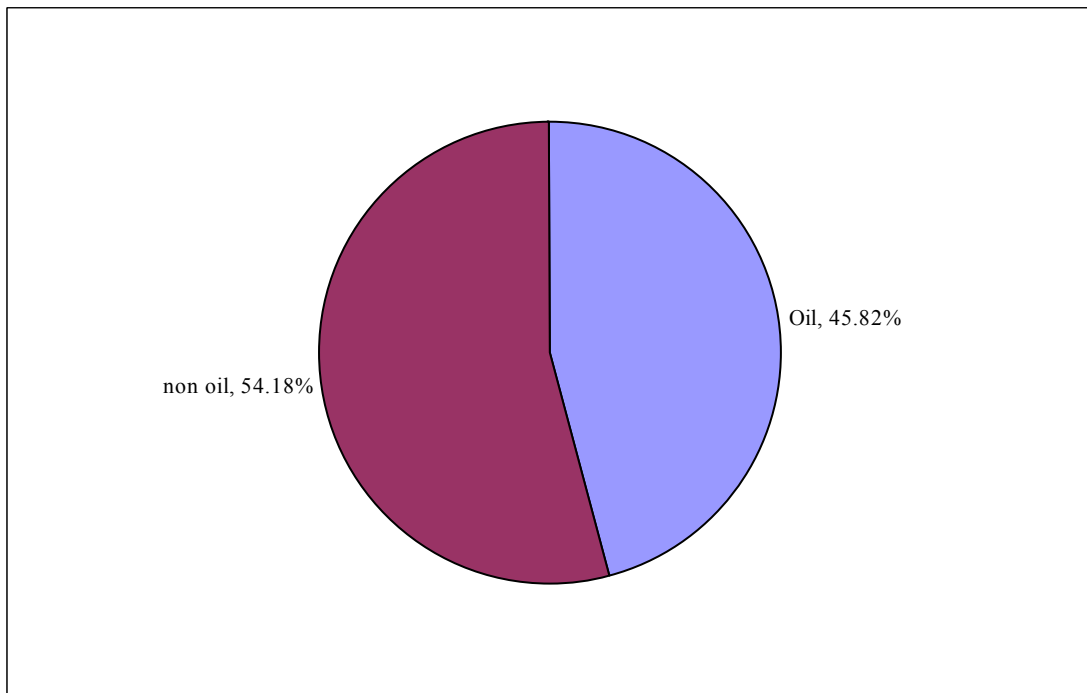
Figure 2.21: Ratios of oil and non-oil exports relative to total exports, Kuwait 1980

Non oil, 2.50%

Oil, 97.50%
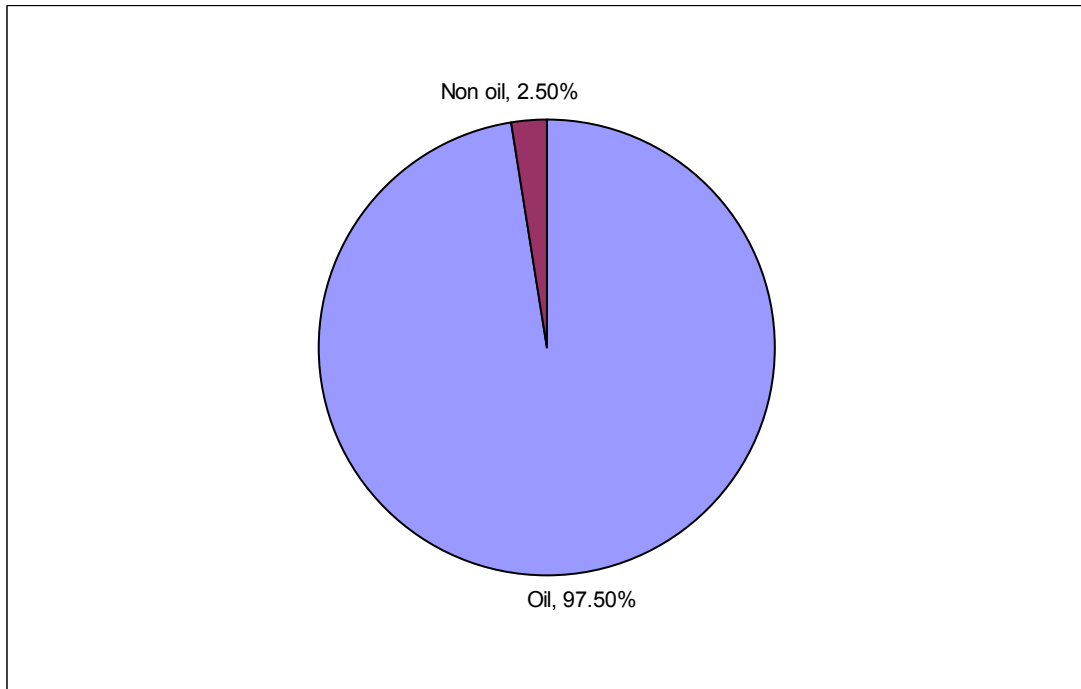
Figure 2.22: Ratios of oil and non-oil exports relative to total exports, Kuwait 2004

Non oil, 7.39%

Oil, 92.61%
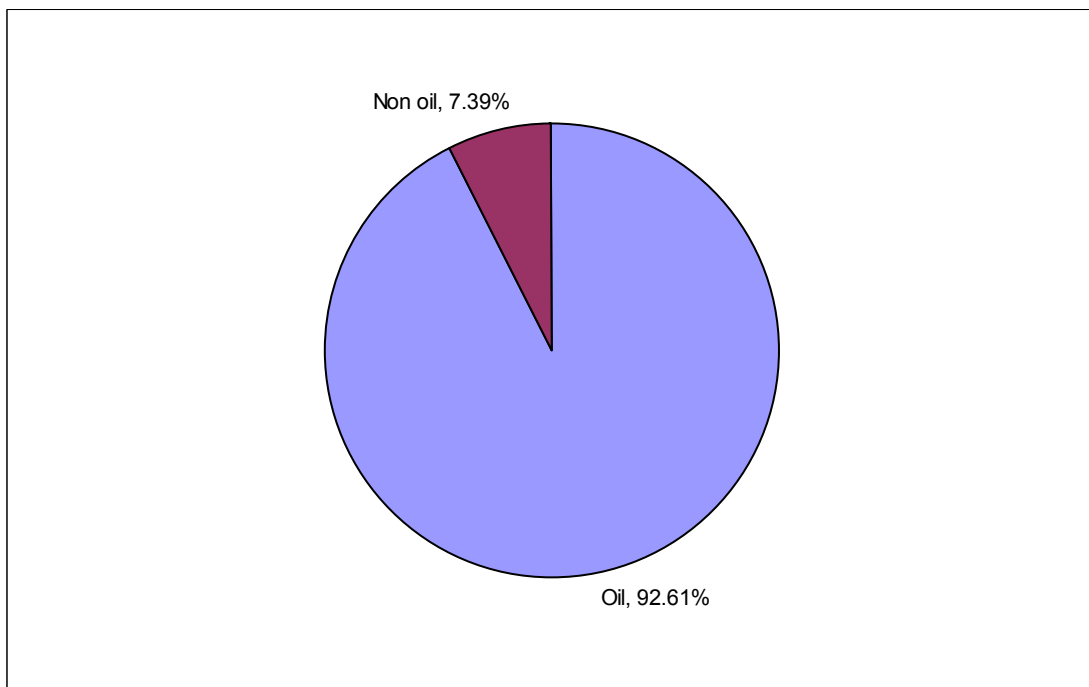
Figure 2.23: Ratios of oil and non-oil exports relative to total exports, Oman 1980

Non oil, 2.20%

Oil, 97.80%
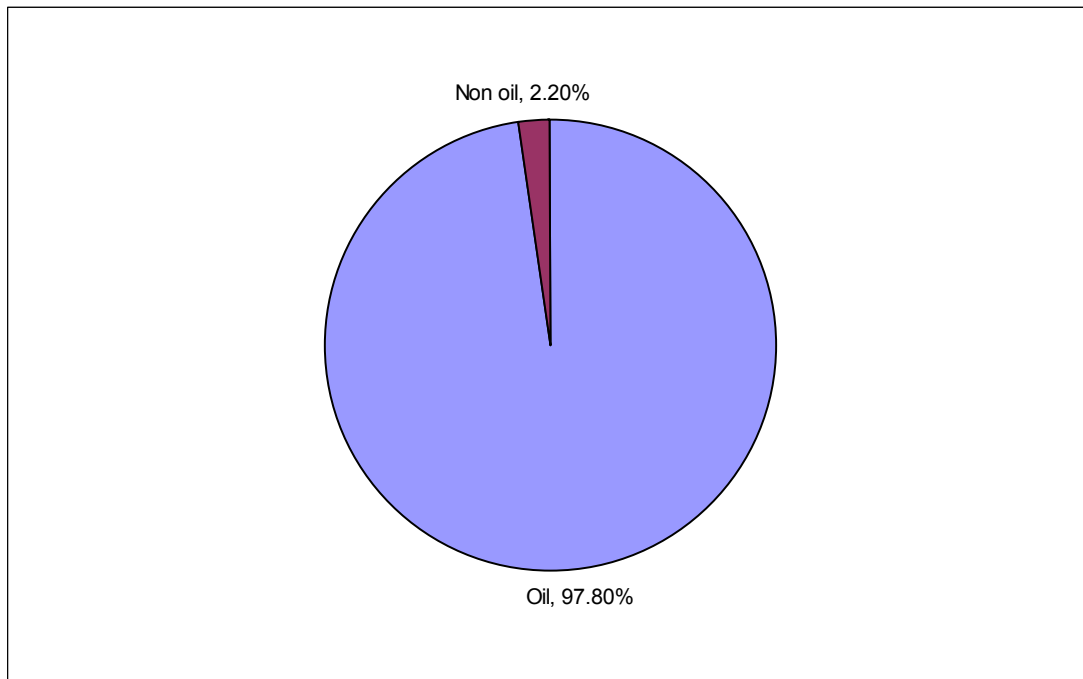
Figure 2.24: Ratios of oil and non-oil exports relative to total exports, Oman 2004

Non oil, 7.78%

Oil, 92.22%
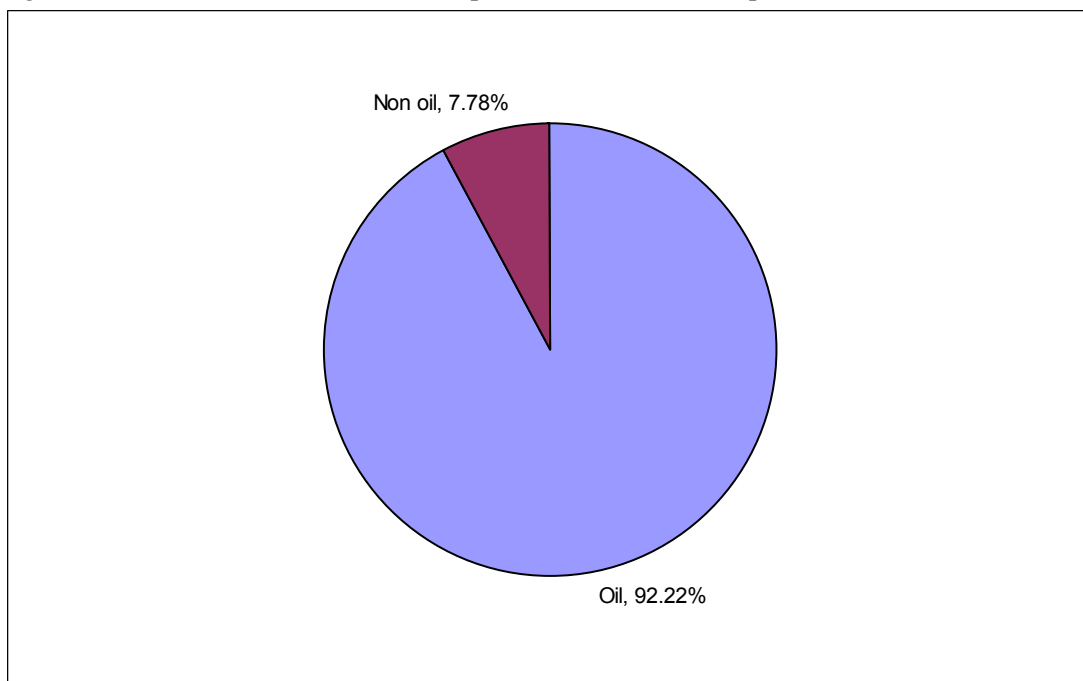
Figure 2.25: Ratios of oil and non-oil exports relative to total exports, Qatar 1980

Non oil, 3.84%

Oil, 96.16%
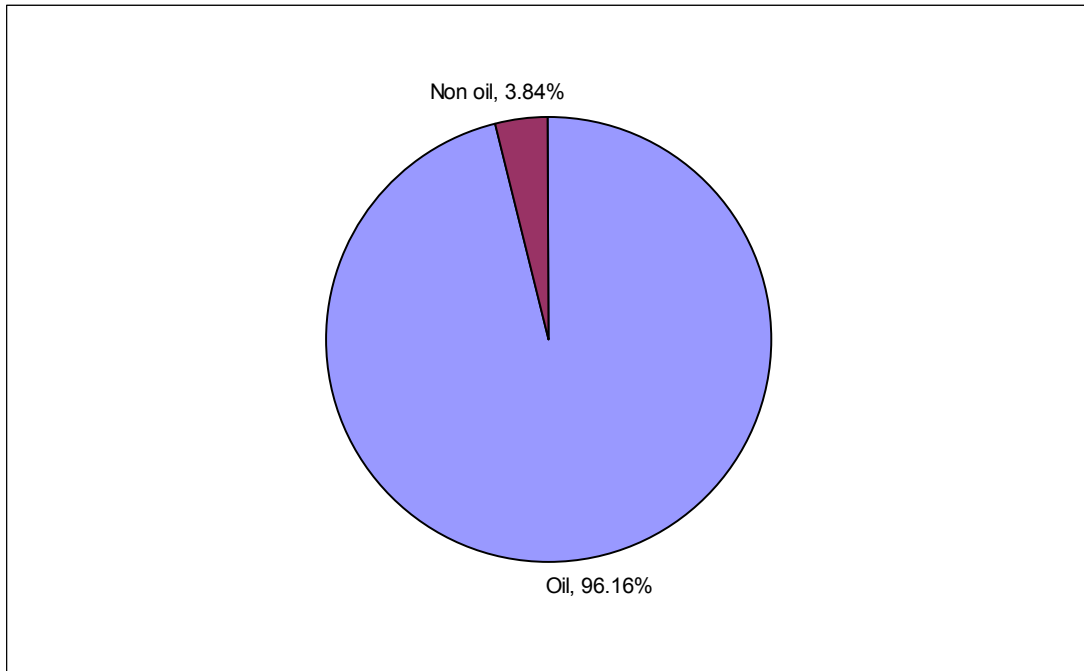
Source: United Nation Statistics (UNCOMTRADE), 2006

Figure 2.26: Ratios of oil and non-oil exports relative to total exports, Qatar 2004

Non oil, 12.62%

Oil, 87.38%
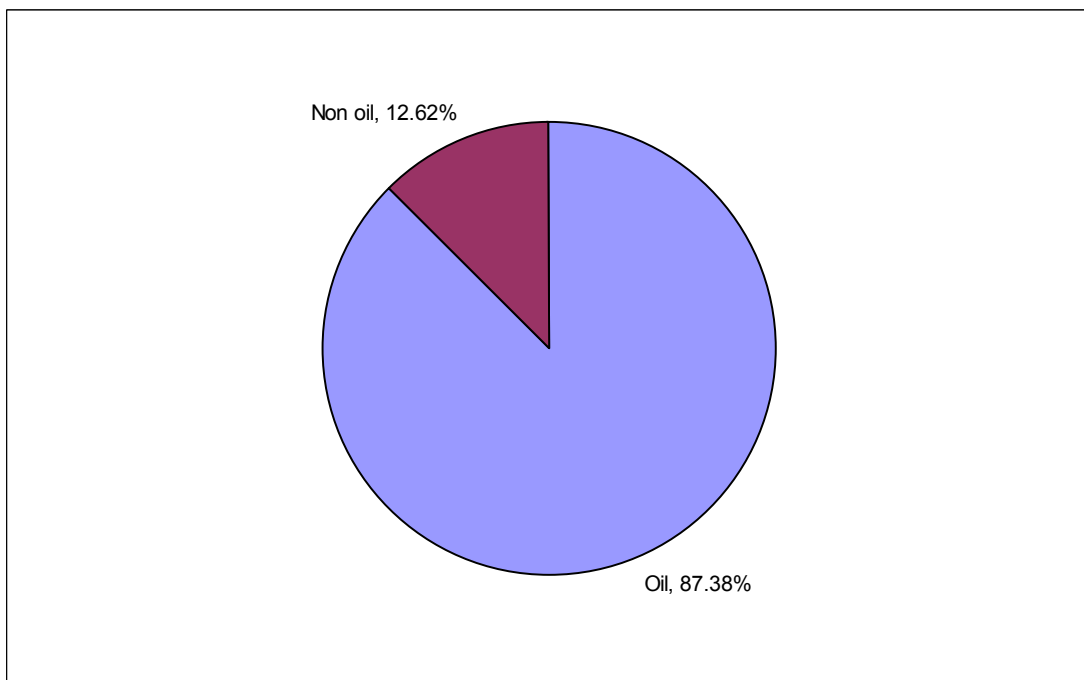
Source: United Nation Statistics (UNCOMTRADE), 2006

Figure 2.27: Ratios of oil and non-oil exports relative to total exports, Saudi Arabia 1980

Non oil, 0.63%

Oil, 99.37%
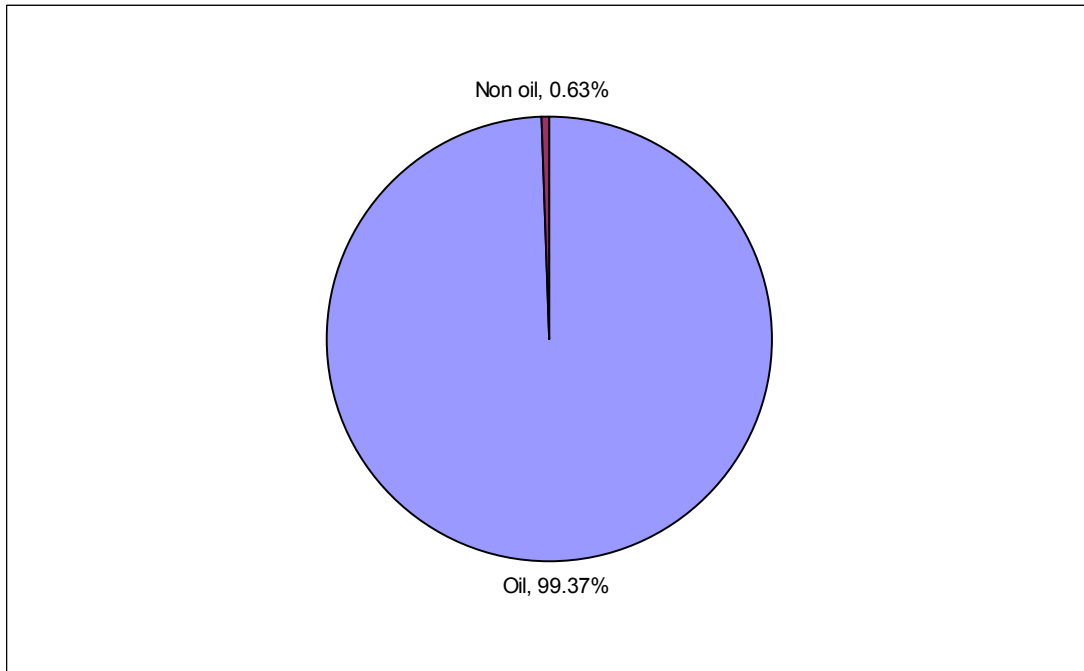
Figure 2.28: Ratios of oil and non-oil exports relative to total exports, Saudi Arabia 2004

Non oil, 13.08%

Oil, 86.92%
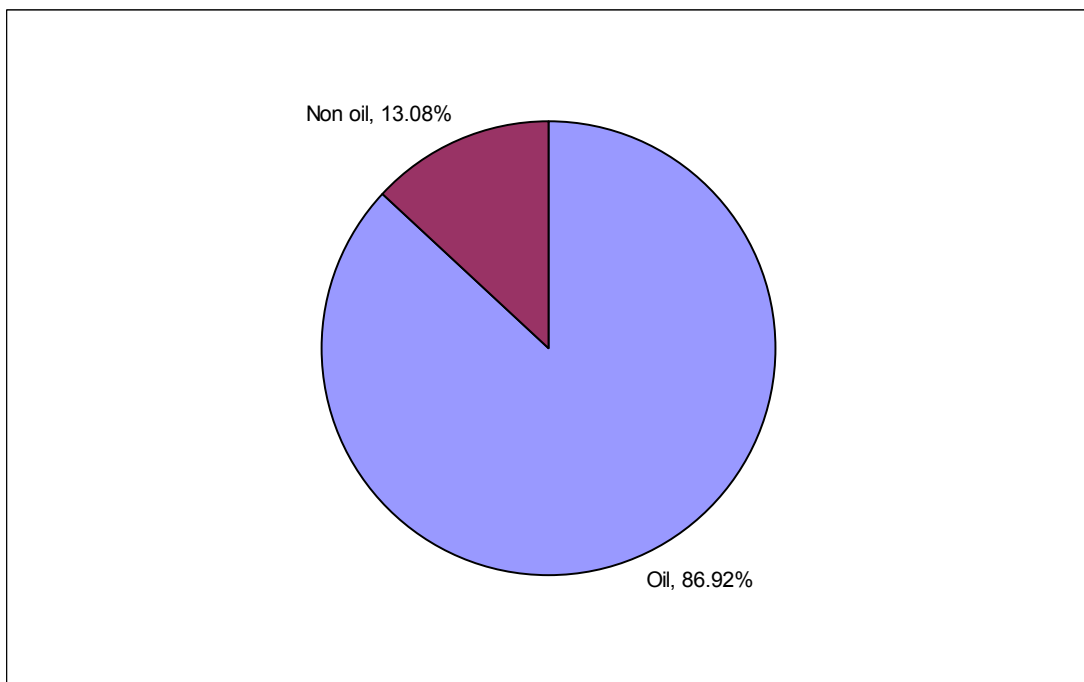
Figure 2.29: Ratios of oil and non-oil exports relative to total exports, UAE 1980

Non oil, 4.54%
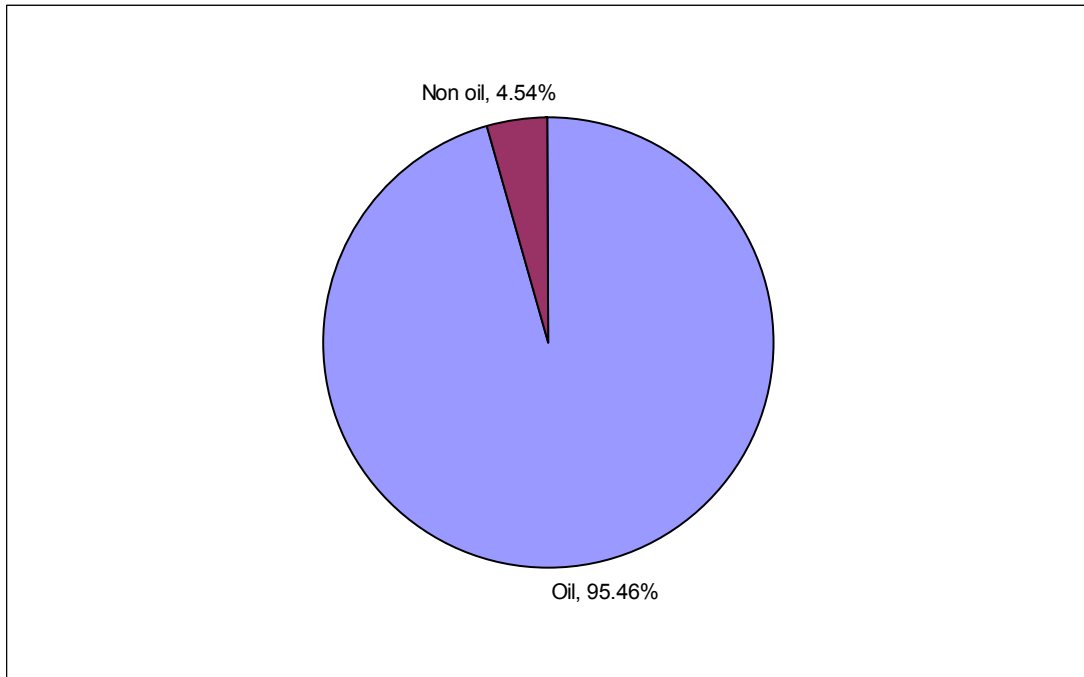
Oil, 95.46%

Figure 2.30: Ratios of oil and non-oil exports relative to total exports, UAE 2004

Non oil, 36.42%

Oil, 63.58%
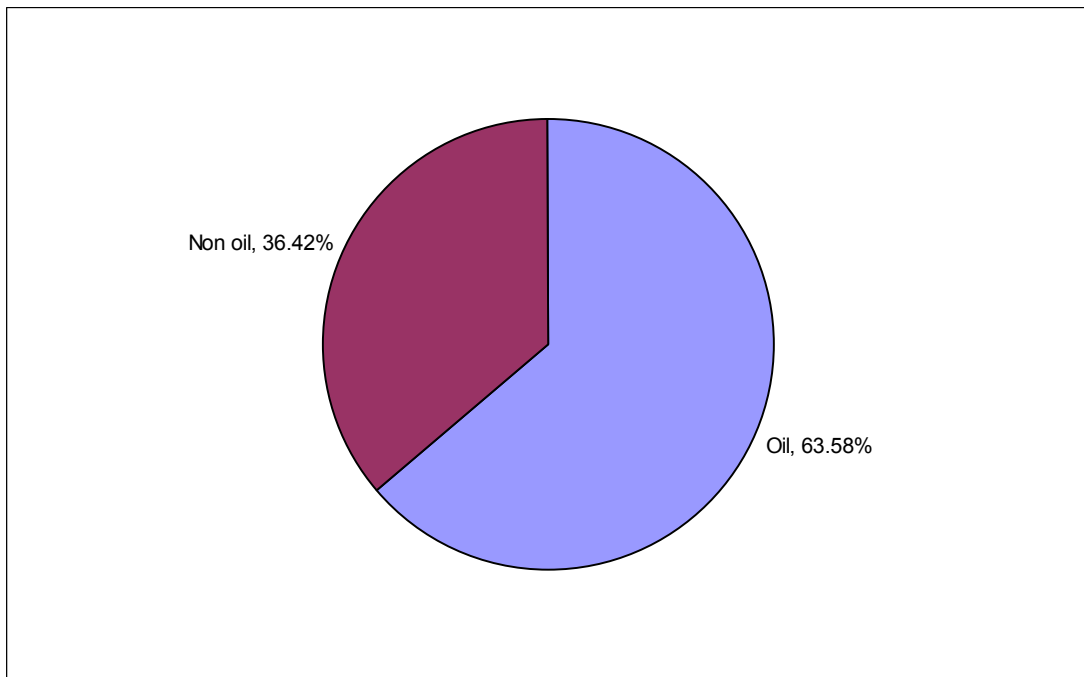
Figure 2.31: Intra-GCC non-oil exports in relation to oil prices (1980-2004)*

54
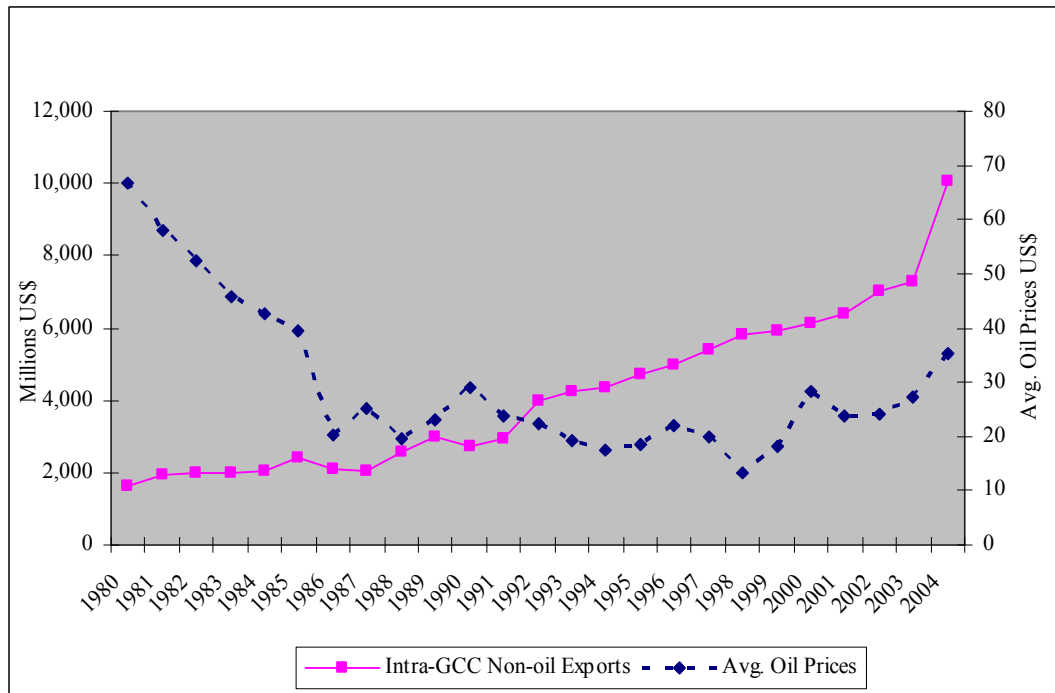
Appendix 2.A

Table 2.A.1. List of Participated Countries

GCC Members:	India
Bahrain	Indonesia
Kuwait	Ireland
Oman	Italy
Qatar	Jordan
Saudi Arabia	Korea
United Arab Emirates	Malaysia
	Netherland
Non-GCC countries:	Norway
Australia	Pakistan
Austria	Singapore
Belgium	Spain
Canada	Sudan
China	Sweden
Cyprus	Switzerland
Denmark	Syria
Egypt	Thailand
France	United Kingdom
Germany	USA
Greece	Yemen
Hong Kong	

Table 2.A.2. Oil and Gas Share in GDP (percent)

	Bahrain	Kuwait	Oman	Qatar	Saudi Arabia	UAE
1980	30.45	65.27	69.65	66.20	62.89	64.43
1981	25.55	60.99	72.20	59.91	65.69	59.15
1982	25.55	48.31	69.43	40.23	54.04	50.29
1983	19.18	49.75	50.91	45.85	46.88	44.81
1984	19.64	50.74	50.68	45.84	39.46	44.81
1985	16.69	50.26	47.85	40.01	34.53	45.90
1986	13.92	35.95	31.35	27.79	29.47	32.01
1987	17.30	38.12	46.93	29.60	23.64	37.40
1988	17.15	35.93	44.41	27.12	21.89	34.33
1989	15.48	21.40	45.77	29.40	27.56	39.01
1990	17.24	44.76	49.43	38.03	35.99	46.72
1991	14.23	19.25	42.41	33.96	36.02	42.32
1992	18.14	42.71	42.73	35.84	35.05	42.08
1993	15.57	33.58	37.32	32.57	33.73	36.37
1994	14.17	31.25	36.76	31.97	33.13	32.02
1995	15.38	40.69	38.31	36.91	31.09	30.87
1996	18.00	43.81	42.21	38.73	34.28	32.75
1997	18.56	39.46	40.40	42.27	32.89	30.00
1998	13.51	29.99	31.17	34.84	24.12	21.35
1999	18.10	36.30	39.43	40.74	29.09	24.89
2000	27.90	48.82	48.90	60.43	37.13	33.74
2001	24.82	43.91	42.83	57.00	33.55	27.88
2002	24.69	41.21	41.92	56.76	33.51	27.88
2003	25.20	46.57	41.97	57.59	38.07	31.95
2004	28.24	47.73	42.43	62.15	42.21	32.84

Source: Joint Arab Economic Reports, 1980-2004

3 Business Cycles Synchronization among the GCC countries: the Role of Trade, Specialization and Financial Openness.

3.1 Introduction

The six members of the Gulf Cooperation Council (GCC) have been seeking economic integration since its establishment in 1981, where a monetary union with a single currency is expected by 2010.[44] Major benefits of forming a currency union could include elimination of the currency conversion costs, contributing to lower transaction costs. In addition, membership of a currency union would represent a more credible commitment, therefore lowering uncertainty associated with currency exchange rates. A larger market will probably lead to greater competition which may contribute to increasing economies of scale and lower prices. The major cost would be the loss of the national monetary policy (Mundell, 1961), where a supranational authority takes charge. Such a cost would be lowered as the business cycles between members become more synchronized. For instance, if economic shocks among member countries are asymmetric, monetary policy cannot be tailored to handle one country's individual shock. In addition, countries facing similar shocks but experiencing different speeds of adjustment would probably incur a higher cost from losing monetary independence.

"*..the countries that have the largest co-movements of outputs and prices with potential anchors are those with the lowest costs of abandoning monetary independence*", say Alesina *et al.*(2002). Therefore, assessing the business cycles co-movement among candidates of a common currency would be important in evaluating the costs and benefits of adopting a single monetary system. In order to analyze the costs and benefits, it would be highly important to analyze the determinants of the business cycles synchronization. Among the major determinants are bilateral trade, patterns of specialization, and financial openness. There is a wide range of literature devoted to these determinants, but there is no definite answer on why some countries experience synchronized outputs while others do not. Empirically, evidences have been conflicting, possibly owing to the econometric models applied, country coverage and/or sample period.

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[44] The UAE has recently ditched its plan to join the proposed monetary union, while Bahrain, Kuwait, Qatar, and Saudi Arabia are committed to pursuing the common currency by 2010.

Since the establishment of the GCC, outputs of the members have been associated with high volatilities owing to the dependence on oil exports as a source of income.[45] Given such output volatility, the adoption of a single monetary authority would require more attention to outputs synchronization. Therefore, the main objective of this essay is to investigate empirically the relationship between trade, patterns of specialization and financial openness and how they affect the business cycles synchronization among the GCC countries and their major trading partners. These factors will be evaluated in the context of a system of simultaneous equations approach, suggested by Imbs (2004), which provide an adequate investigation of the complex system of interactions among trade, specialization, financial openness and output synchronization. In other words, this system of equations would make it possible to identify the direct impact of the above factors as well as any indirect impact working through interactions between trade, specialization and financial openness.

The major findings of this paper are as follows. First, higher trade has a significant positive association with business cycle synchronization between the GCC countries and their trading partners, but not between the GCC countries themselves. In addition, higher trade shows significant associations with different patterns of specializations, which may translate into lower output synchronization. Second, different patterns of specialization are found to have a significant association, directly as well as indirectly, with lower business cycles synchronization among the GCC countries. Third, higher financial openness is associated with a direct impact on higher output co-movement between GCC countries and their major trading partners, but was not shown to play a significant role among the GCC countries. Controlling for alternative measure of output synchronization and trade intensity confirms the robustness of the above findings.

This essay makes three major contributions to the empirical literature. First, to my knowledge, this is the first study to have analyzed the determinants of trade, specialization, and financial openness on the business cycles synchronization among the GCC countries. Due to the limitation of existing measures of financial openness,

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[45] See figures 3.1-3.6 for an overview of real GDP growth for GCC countries.

the second contribution in this essay is the construction of a measure of financial openness for the GCC countries from 1981 to 2004. This will be based on information from the IMF's Annual Reports on Exchange Arrangements and Exchange Restrictions and following the methodology used by Miniane (2004). When measuring the impact of trade intensity on business cycles synchronization, it is possible that two countries experience synchronized outputs, not because of their bilateral trade, but due to their trade with the same trading partners. The third contribution is to complement the trade intensity measure by constructing a bilateral measure of *dissimilarities* of trading partners.

This essay is organized as follows. The next section is an overview of the business cycles across the GCC countries. The third is devoted to the related literature review. Section 3.4 describes the empirical model and data description. Section 3.5 presents the empirical evidence, while section 3.6 is devoted to testing the robustness of the results. The last section concludes.

3.2   Business cycles among the GCC countries

The high dependence on oil as a source of income is probably one of the most distinctive aspects of the GCC economies that may influence comovement of their outputs. Another distinctive aspect is the large government size and expenditure that are highly dependent on natural resources as a source of income, where budget surpluses and deficits have mostly accompanied periods of high and low oil prices, respectively. Most of the government expenditures are devoted to development projects in infrastructure, health care, education and service.[46] The private sector, which is mainly characterized by non-oil activities, is also tied to government spending, which make it indirectly vulnerable to changes in oil price.[47] Therefore, a diversification of income away from natural recourses as well as reducing the contribution of the public sector would be an important determinant of comovements of GCC business cycles. While this essay will consider the role of oil and

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[46] See table 3.A.1 (appendix A) for government expenditure relative to GDP across the GCC countries.
[47] For more details about the contribution of governments expedites on economic growth, as well as non-oil sector growth, see Al-obaid Al-Yousif (2000), Treichal (1999), Ghali and Al-Shamsi (1997), Chalk(1997) and Fasano and Wang (2001).

diversification across the GCC, the role of government size and expenditure are beyond the aim of the essay.

A first step toward analysing output correlations would be to look at the real GDP growth for each GCC member. Figures 3.1-3.6 show high outputs volatility from 1981-1995, followed by a much more stable growth. Tables 3.1.1 through 3.1.6 present the real GDP correlations among the GCC countries, de-trended using the Hodrick-Prescott (HP) filter, in which each table represents a period of 4 years.[48]

The period 1981-1984 shows that most countries, apart from Oman, experienced fairly high positive correlations. Overall, more than 86 percent of the correlations between country pairs are positive, with an average correlation of 0.55. Negative correlations dominate country pairs during the period 1985-1988, which has been associated with a severe drop in oil prices, in which 73 percent of the correlations are negative. Not unexpectedly, 60 percent of the country pair correlations are negative during the period 1989-1992 which has been associated with the Gulf War. Later periods, with rising oil prices, show an increase in the number of positive correlations especially for the period 1997-2000 in which all country pair correlations are positive and high-ranging, between 0.51 and 0.996. Although 53 percent of the correlations are negative during the period 2001-2004, they are only associated with country pairs including either Oman or Qatar.

A number of studies argue that some of the requirements for launching a common currency in the GCC are not satisfied. Laabas and Limam (2002) find a slow convergence in macroeconomic fundamentals and that business cycles are unsynchronized.[49] Sturm and Siegfried (2005) show that there is a high monetary convergence among the GCC members, but lower fiscal convergence, where the level of deficits/surpluses varies significantly among the members. In an empirical study to assess the suitability of establishing a GCC monetary union, Abu-Qarn and Abu-

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[48] The HP filter is a data-smoothing technique that is commonly applied to remove short-term fluctuations that are associated with the business cycle, thereby revealing long-term trends. The filter has been proposed originally by Leser (1961), whose work is building on the graduation method developed by Whittaker (1923) and Henderson (1924). It requires a smoothing constant as an input, which is usually fixed in an *ad hoc* way. A value of 100 is recommended for annual data and 1600 for quarterly data.

[49] Based on the generalized purchasing power parity.

Bader (2006) argue that the GCC members are not yet ready to establish a well functioning monetary union. They show that only demand shocks are symmetric, while there is a lack of significant correlation among supply shocks. In addition, they argue that there is no evidence of synchronized long-run and short-run movement in output. In a related contribution, Alturki (2007) argues that GCC countries show no correlation between the cyclical components of their GDP's. Similarly, Alabdulwahab (2008) concludes that the GCC countries face symmetric oil shocks, but there is a low correlation among supply shocks.[50]

The above review shows a somewhat unstable output co-movement among the GCC members. Understanding what determines their co-movement is a vital empirical question. The next section presents a review of the major determinants of business cycles synchronizations.

3.3   Determinants of business cycles synchronization: a Literature review

An important question in business cycles synchronization literatures is the following: What determines the business cycles co-movement across countries? There is a wide range of literature devoted to this question, but there is no definite answer on why some countries experience synchronized outputs while others do not. Empirically, evidence has been conflicting, possibly owing to the econometric models applied, country coverage and/or sample period.

Wynne and Koo (2000) propose two explanations for what may cause the business cycles to be different across countries. First, countries may face different economic shocks. Second, common shocks, e.g. oil shocks, can hit countries or regions, but it is possible that countries may have different responses and reactions to these common shocks. Such differences in response are probably the result of the differences in the economic policy in each country, or the differences in the output structure, specialization, in each country. Another approach to explain business cycles, according to Karras (1994), is to classify economic shocks into demand shocks and supply shocks. The Keynesian approach assumes that demand shock is the main factor affecting business cycles. Real business cycle theory, on the other hand,

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[50] Using a SVAR approach.

assumes that supply shock is the major channel affecting business cycles. Analyzing the business cycles of France, Germany, and the United Kingdom, Karras (1994) argues that both demand and supply shocks do significantly impact their business cycles.

When analyzing the business cycles of a group of countries, it is important to identify the factors that could impact the synchronization of business cycles among them. A growing number of theoretical and empirical studies have been devoted to the determinants of output synchronization and volatility, many of which focus on two main channels. The first is the economic interdependence across countries, which mainly takes the forms of trade and financial integration. The stronger the economic integration between two countries, the higher the business cycles correlation between them. The second channel is the degree of similarity in terms of specialization across countries, where more similarity is associated with higher output correlation. Relevant literature on the impact of trade, specialization and financial openness on business cycles synchronization is discussed below.

3.3.1   The Role of Trade

The issue of trade and its impact on business cycles has become important since the formation of the European Monetary Union (EMU). Theoretical and empirical research on the factors affecting the business cycles has been widely focused on the trade channel. However, theoretical explanations about the effect of bilateral trade on business cycles synchronization are ambiguous. Trade can affect business cycles synchronization in different ways, as the impact of trade openness depends greatly on patterns of trade specialization and the nature of shocks. Openness to trade may result in countries becoming more specialized in certain industries according to their comparative advantage (Ricardian and Heckscher-Ohlin paradigm).

Stockman (1988) argues that sector-specific shocks and national shocks are two channels affecting a business cycle. If demand is the main channel driving business cycles, then business cycles tend to be positively correlated between trading partners, owing to the possible spillover of aggregate demand shocks. On the other hand, if sector-specific shocks are the main channels affecting a business cycle,

increased trade integration can lead to an asymmetric business cycle if it encourages more specialization in different production activities, inter-industry trade, with comparative advantage (Krugman, 1993). However, business cycles could be more symmetric if trade integration leads to intra-industry specialization across countries (Razin and Rose, (1994). Imbs (2001) summarises the effect of trade on business cycles into three - direct and indirect - effects. First, a direct effect is based on the standard Keynesian argument, where fluctuations in aggregate domestic demand of foreign goods would have an effect on a partner country. A second (direct) effect occurs through intra-industry trade, e.g. through trade in intermediate goods. A third (indirect) effect occurs via specialization, where it affects a business cycle through sector channels and their impact on intra-industry trade.

Empirically, there is no agreement on which effect dominates. Many empirical papers have found that pairs of countries that trade more experience a higher degree of business cycles synchronization. Frankel and Rose (1998), major contributors to the literature, argue that higher trade intensity has a robust association with higher synchronized business cycles.[51] However, Frankel and Rose (1998) did not control for which trade channel, intra/inter-industry trade, has the largest impact on the output synchronization. Similarly, Clark and van Wincoop (2001), in a study investigating the business cycles among US states and European countries, controlled for sectoral specialization, level of trade, monetary policy and fiscal policy, and found that higher trade is associated with higher synchronized business cycles.

Further support is found in recent papers. Baxter and Kouparitsas (2005) applied extreme bounds analysis on a dataset including over 100 counties and controlled for trade, sectoral structure, similarity in export and import baskets, factor endowments and gravity variables. They found that bilateral trade is the most important factor associated with business cycles synchronization.[52] Calderon *et al.*(2007) extended the study of Frankel and Rose (1998) and controlled for the similarities in the structure of production among a sample of 147 industrial and developing countries. When examining each group individually, they found a significantly higher impact of trade intensity among industrial countries than among

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[51] Frankel and Rose (1998) provide empirical evidence by regressing pairwise correlation of GDP on bilateral trade intensity for a sample of 21 OECD countries.
[52] The Extreme bound analysis has been advocated by Leamer (1983).

developing ones. After controlling for production similarity, trade intensity is found to have a higher impact on business cycles correlations for countries with similar production structures. Imbs (2001) focused on sector similarities and bilateral trade intensity among countries, and found that trade has at best a very small impact on output correlations. The result holds for OECD countries and for a sample of 136 countries.

On the other hand, the authors of several empirical papers argue that trade is not the main motivator of international business cycles. Kose and Yi (2001) examine the ability of the standard international business cycle model to replicate the estimates of higher bilateral trade on business cycles synchronization, but they find that the Armington-aggregator-based international business cycle model didn't provide support for these results. Similarly, Kose *et al.* (2003a) examined the impact of globalization on business cycles synchronization using a sample of industrial and developing countries during the period from 1960-1999. Their results suggest that trade openness seems to have a weak negative impact on output synchronization, and this could be because more open economies can be more exposed to external shocks. In addition, countries that experience more volatile terms-of-trade shocks are associated with low synchronization with world output. In a later contribution, Kose and Yi (2004) apply a three-country-model business cycle model , and argue that the failure of the model is due to the small share of trade relative to GDP and the country's total trade.

3.3.2   The Role of Specialization

A second determinant of business cycles synchronization is the similarity of economic structures between countries. In general, business cycles among pairs of countries tend to be positively correlated as countries became specialized in similar activities. If sector-specific shocks are dominant, then countries' business cycles would tend to correlate positively. Stockman (1988), among early studies, shows that common sectoral shocks are important determinants of business cycles.

In a recent study, Kraay and Ventura (2007) argue that business cycles among rich countries are less volatile and more synchronized with the world cycles than with

that of poor countries. The explanation for this could be due to the pattern of specialization in rich and poor countries which specialize according to their comparative advantage. Rich countries tend to specialize in industries that rely on advanced technology and skilled labour, while poor countries specialize in industries relying on less advanced technologies and low-skilled labour.

Fatas (1997) supported the argument that it is the degree of regional specialization, in addition to economic policy coordination, that determines the shape of business cycles across countries.[53] Kalemli-Ozcan *et al.*(2001) regressed measures of asymmetry in GDP fluctuations for OECD countries and US states on the industrial specialization index, and found that higher specialization in production is associated with less correlated outputs. Reaching a similar conclusion, Imbs (2001) provided robust evidence based on a study covering 49 countries in which similarity of sectoral production among countries is highly associated with more synchronized business cycles. One reason behind specialization is the need to utilize comparative advantages. However, a major factor affecting specialization is the presence of production risk, where specialization in a small range of goods or services may make countries more exposed to high variations in GDP, therefore a loss of economic welfare.

3.3.3   The Role of Financial openness

Financial openness and integration is a third important factor contributing to the business cycles volatility and correlation. Cross-border capital flows over the last two decades have been a major issue in the process of globalization. Since the early 1980s, capital flows have risen from less than 5 percent to about 20 percent of GDP for advanced countries. For emerging countries, capital flows rose about fourfold and currently represent about 5 percent of their GDP (Kose et al., 2003a). Different empirical studies have suggested that financial liberalization can lead to various benefits, including financial development, more efficient allocation of resources and better opportunities for risk diversification. Mundell (1973) argued that, as long as

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[53] Fatas examined business cycles at the regional and national levels in Europe from 1966-1992 using employment data.

countries are insured through private financial markets, similarity of shocks should no longer be a perquisite for sharing a common currency.

However, the economic theory does not provide a definitive answer about the effect of financial openness on output synchronization, where there are mixed opinions about its role. One possible explanation is the difficulties in measuring financial openness in addition to the shortage and limitation of available data. In addition, studies differ in their sample period and country coverage selections which include either industrial or developing countries or both. The choice of the econometric specification is another contribution to the differences among studies.

One view is that increased financial integration has a negative impact on business cycles synchronization. Krugman (1993) argued that financial integration may lower output synchronization among countries by fostering specialization in activities with comparative advantage, therefore becoming more exposed to industry-specific shocks. Similarly, Obstfeld (1994b) argued that financial integration may induce specialization in risky assets, and demonstrated that international risk-sharing can yield substantial welfare gains through its positive effect on expected consumption growth, where investments shift to more risky and higher yield assets. On the other hand, countries specializing in a limited range of economic activities with no diversified portfolios may suffer from high volatility in output. Backus *et al.*(1994) argued that when there is a complete capital market, output correlation becomes asymmetric as capital shifts to its most productive location that is hit by positive productivity shock. Baxter and Crucini (1995) found that higher financial integration has been associated with a rise in output volatility and a fall in consumption volatility.

Kalemli-Ozcan *et al.* (2001) argued that economic and financial integration could lead to more asymmetric shocks, but not necessarily to more asymmetric income shocks, as a consequence of increased cross-country ownership of assets. They showed that integrated countries may have better options to insure their income, and would therefore tend to specialize in different industries. In such cases, integrated countries may experience lower output correlation following exposure to different industry-specific shocks. In a later study, Kalemli-Ozcan *et al.* (2003) showed that risk-sharing, attained through financial integration, is positively associated with

higher specialization. If this is the case, financial integration would have an impact on business cycles synchronization, depending on the type of specialization. For instance, it is possible that output may become more synchronized if financial openness induces specialization in similar sectors.

To gain a better understanding about the impact of financial integration on output synchronization, it is important to consider the level of financial sectors development. Using data for a sample of 74 countries from 1960-97, Easterly *et al.*(2001) found that development of domestic financial sectors contributes to lower economic volatility. Similarly, Kose *et al.* (2003a) estimated the impact of capital account restrictions and found that countries with restricted capital flows have a lower business cycles correlation.

3.3.4 Interaction between Trade, Specialization and Financial openness

Recent papers have investigated the combined role of part or all of the above factors in determining the co-movement of business cycles. Using a simultaneous equations approach, Imbs (2004) estimated the impact of trade, specialization, and financial openness on the business cycles synchronization. Confirming previous studies, trade is associated with higher business cycles synchronization, where part of this effect is working through intra-industry trade. In addition, the results suggest that financially integrated countries display more synchronized business cycles, even if they are more specialized. Following a similar approach, Schiavo (2008) investigated the role of trade, specialization and financial openness, using a dataset for 20 developed countries over the period 1991-2002. He found robust evidence that capital market integration does contribute to higher business cycles synchronization. In a later contribution, Imbs (2006) used a new dataset measuring bilateral asset holdings, and applied a simultaneous equations approach to distinguish between the direct and indirect impact of financial integration on business cycles.[54] Financial liberalization is found to have some positive impact working directly and through goods trade.[55]

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[54] The data are gathered by the IMF in the context of a coordinated Portfolio Investment Survey (CPIS).

[55] Similar findings are found in an empirical study based on data from 1960-1999 and covering 76 countries. Kose *et al.*(2003) controlled for different measures of trade openness and financial integration and found that trade and financial market integration do enhance global spillovers of macroeconomic fluctuations.

In an empirical study based on data from 1960-1999 and covering 76 countries, Kose *et al.* (2003a) controlled for different measures of trade openness and financial integration and found that trade and financial market integration do enhance global spillovers of macroeconomic fluctuations.

3.3.5   The Role of Regional Agreements

Regional agreements such as a monetary union and sharing a common currency play an important role on business cycles synchronization. The coordination of economic policies, fiscal and monetary, is an important factor in determining the size and shape of business cycles across members of a regional agreement, which could work through impacting trade, specialization and/or financial integration. Rose (2000), and Frankel and Rose (2002) found that a currency union leads to a significant increase in intra-trade. In a similar conclusion, Glick and Rose (2002) estimated the effect of currency union on trade using a sample of about 200 countries from 1947-1997. The result was that membership in a currency union is associated with a doubling of bilateral trade. Increase in trade intensity, an expected potential gain, could be a channel for transmitting output shocks among members which may therefore increase business cycles synchronization. If this is the case, the need for an independent monetary policy will became less important as a stabilization tool.

In addition, joining a currency union will bring the benefit of more credible commitment to exchange rate and coordinated policies, which could be associated with more synchronized business cycles. Artis and Zhang (1999), in a study to examine if business cycles are associated with the exchange rate system, found that synchronized business cycles are partially associated with stable exchange rates. Furthermore, a higher integration taking the form of trade or FDI may contribute to a higher spread of productivity shocks and technology sourcing.[56]

3.4   **Empirical analysis**

This section will be devoted to an empirical estimation of the impact of trade, specialization and financial openness on the business cycles synchronization. Trade,

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[56] See (Coe and Helpman, 1995) for more about the role of trade, and (Lichtenberg, 1998) for more about the role of FDI.

in principle, is expected to have a positive impact on output synchronization. However, the low share of intra-trade among GCC countries makes it difficult to have a clear expectation. In addition, the type of trade, inter- or intra-industry, will affect the direction of impact on output synchronization.

Natural resources play an important role in the GCC economies, where some countries are expected to run out of oil sooner than others. Therefore, economic diversification and reduction of natural resources dependency is a major goal of economic policy. Specialization and a diversification plan in each country are expected to play an important part in determining the output synchronization. If members of the GCC undertake different paths of diversification from dependence on oil, it would then be expected that specialization will make the members' outputs less synchronized. If, on the other hand, the GCC members are pursuing similar specialization paths, this would contribute to a positive impact on output synchronization.

Since financial openness is greater among GCC countries, it is expected that it would play an important role on the business cycles synchronization. The direction of the impact would be highly dependent on its impact on trade and specialization, and whether it promotes inter/intra-industry trade and specialization in similar/different activities. A positive impact is expected if financial openness is promoting higher specialization in similar activities and intra-industry trade.

3.4.1 Methodology

The empirical approach will adopt the simultaneous equations approach, as suggested by Imbs (2004), to identify the role of trade, specialization and financial openness in determining output correlation among GCC countries and their major trading partners. The approach will make it possible to better investigate the interaction among these factors, therefore distinguishing between the direct and indirect impact of each factor on the business cycles synchronization. The system of equations takes the following form:

$$\rho_{i,j,t} = \alpha_0 + \sum_{t=2}^{T}\theta_t + \alpha_1 T_{i,j,t} + \alpha_2 S_{i,i,t} + \alpha_3 F_{i,j,t} + \alpha_4 GCC_{i,j} + \alpha_5 I_{1,i,j,t} + \varepsilon_{1,i,j,t} \quad (3.1)$$

$$T_{i,j,t} = \beta_0 + \sum_{t=2}^{T}\theta_t + \beta_1 S_{i,j,t} + \beta_2 F_{i,i,t} + \beta_3 GCC_{i,j} + \beta_4 I_{2,i,j,t} + \varepsilon_{2,i,j,t} \quad (3.2)$$

$$S_{i,j,t} = \gamma_0 + \sum_{t=2}^{T} \theta_t + \gamma_1 T_{i,j,t} + \gamma_2 F_{i,j,t} + \gamma_3 GCC_{i,j} + \gamma_4 I_{3,i,j,t} + \varepsilon_{3,i,j,t} \tag{3.3}$$

$$F_{i,j,t} = \delta_0 + \sum_{t=2}^{T} \theta_t + \delta_1 T_{i,j,t} + \delta_2 GCC_{i,j} + \delta_3 I_{4,i,j,t} + \varepsilon_{4,i,j,t} \tag{3.4}$$

where i, j refers to country pairs, i represents a GCC country only and j represents countries belonging to GCC and non-GCC. The analysis is based on annual unbalanced data, where t represents periods (1-6).[57] ρ measures output correlation, T is bilateral trade intensity, S is a specialization index capturing how different the economic sectors are between country pairs, and F is a bilateral financial openness index measuring the level of openness in capital transactions in country i with respect to country j. All previous variables are assumed to be endogenous, and expressed in logs, expect for output correlation coefficient. θ_t represent time fixed effect. $\varepsilon_{i,j,t}$ is error term.

I_1, I_2, I_3 and I_4 are additional exogenous determinants for output correlation, trade, specialization and financial openness, respectively.[58] Exogenous variables with an expected direct impact on business cycles synchronization are included in I_1, which are average percentage changes in price of oil in absolute value, and the product of the share of oil in output in country i and j. The inclusion of oil price and the share of oil in output are intended to control for how each country would respond to fluctuation in oil prices. It is expected that fluctuation in oil prices would be negatively associated with output synchronization, given that the GCC's major trading partners are net importers of oil, and therefore would be exposed differently to changes in oil prices. Furthermore, it is expected that countries with higher oil share in their output would react differently from countries with a lower oil share. A higher oil share in each country is expected to contribute to more synchronized business cycles.

Equation (3.1) is an extended version of the model presented by Frankel and Rose (1998), where they focused on the impact of trade intensity on business cycles correlation, which consisted of both inter- and intra-trade. Direct impacts of trade, specialization, financial openness and GCC membership are captured in this equation.

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[57] 1981-1984 (period 1), 1985-1988 (period 2), 1989-1992 (period 3), 1993-1996 (period 4), 1997-2000(period 5), 2001-2004 (period 6).

[58] Difference between I_2, I_3 and I_4 is at least required.

The inclusion of trade is based on the Keynesian argument that fluctuation in aggregate domestic demand of foreign goods would have an effect on a partner country's output, in addition to the wide literature supporting the high association between trade and output co-movement.[59] The inclusion of specialization is to control for the assumption that countries with similar sectors face similar output shocks. Finally, financial openness is included to control for the potential impact of financial liberalization on allocation of resources and assets diversification. The interpretation of the coefficients in equation 3.1, α_2 for instance, is that doubling trade intensity results in an increase in business cycles correlation by [α_1 x ln(2)].

Trade intensity in equation (3.2) is explained by specialization and financial openness indexes between country pairs. The specialization index is intended to work as a proxy for intra-industry trade, where, for instance, a high (S) would represent a low intra-industry trade. The financial openness index represents the impact on trade attained through lower capital transactions, e.g. trade credit. The so-called gravity variables are included in I_2, which consists of countries' GDPs, population, geographical distance, a dummy for sharing a common border, and a time trend. These variables have been extensively used in the literature due to their exogeneity and high predictive power on trade flows.[60]

Specialization in equation (3.3) is driven by trade and financial openness, where classical economic theory predicts that an increase in trade, inter-industry, may lead to fewer economic similarities among pairs (high S), therefore becoming more vulnerable to industry-specific shocks. On the other hand, if trade is dominated by intra-industry trade, then higher trade would contribute to higher similarities across countries (low S). Financial openness is included to control for the assumption that access to international capital markets may afford economic specialization, especially in sectors that are needful of external funds. As discussed in the literature, the impact of financial openness on specialization is not clear, as it could induce specialization in different or similar economic activities, and therefore affect output synchronization indirectly.

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[59] See Frankel and Rose (1998), Imbs (2001, 2004), Clark and van Wincoop (2001), Baxter and Kouparitsas (2005) and Calderon *et al.*(2007).
[60] See for instance, Frankel and Rose (1998)

It is also important to control for the stages of development and the level of income, which are highly associated with the level of specialization, and which could therefore explain output synchronization. Baxter and Kouparitsas (2003) compared industrialized and developing countries in terms of the dispersion in production and trade, and found that industrialized countries have low dispersion while developing countries have very high dispersion. It is argued that low-income countries tend to be more specialized than rich countries. For instance, less-developed countries may have a larger agriculture sector than more-developed countries. Therefore, exogenous determinants for I_3 are the difference between GDP per capita for country-pairs in addition to their product. Furthermore, differences of GDP per capita would control for the assumption that richer countries with similar income levels (lower difference in GDP per capita) might have similar consumption patterns.[61]

Financial openness in equation (3.4) is assumed to depend on trade intensity to control for the assumption that the pre-existence of trade linkages may lead to higher capital openness and flows. Exogenous determinants in I_4 include measures of development and economic diversification.[62] The first is GDP per capita for main country, i, to control for the level of development which is expected to contribute to higher financial openness. The second is the share of oil sector in GDP, which would work as a proxy for how a country is dependent on oil, where it is expected that countries with a lower ratio of oil would be more motivated to open their financial system in order to promote economic diversification. A time-trend variable will be included to account for the issue that lower financial restrictions were imposed as time passed.

A dummy representing the membership in the GCC is introduced in each equation in order to better address the role of the GCC membership in business cycles

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[61] For instance, developed countries would have a higher portion of income being spent on luxury items than developing countries, while low-income countries would have more income being spent on necessity goods.

[62] Part of the differences in I_4 compared to I_3 is that financial openness is mainly driven by country-specific factors.

synchronization, as well as its association with trade[63], specialization and financial openness.

3.4.1.1 Direct and indirect channels determining business cycles synchronization

This system of equations would make it possible to identify the direct impact of trade, specialization and financial openness on business cycles synchronization. In addition, it allows for identifying possible indirect impact working through interactions between trade, specialization and financial openness.

The direct impact of trade intensity is captured by α_1 and can originate in interaction with specialization ($\alpha_1 \beta_1$), financial openness ($\alpha_1 \beta_2$), GCC membership ($\alpha_1 \beta_3$), or other exogenous determinants of trade ($\alpha_1 \beta_4$). The indirect effects of trade are working through specialization and financial openness, which are captured by the value on $\gamma_1 \alpha_2$ and $\delta_1 \alpha_3$, respectively.

The specialization's direct effect is captured by α_2 and originates from interactions with trade ($\alpha_2 \gamma_1$), financial openness ($\alpha_2 \gamma_2$), GCC membership ($\alpha_2 \gamma_3$) or the exogenous variables in I_3 ($\alpha_2 \gamma_4$). The indirect effects, on the other hand, would be working through intra-industry trade ($\beta_1 \alpha_1$) in equation (3.2).

Finally, direct effect of financial openness is captured by α_3 and originates from trade ($\alpha_3 \delta_1$), from GCC membership ($\alpha_3 \delta_2$) and from other exogenous variables ($\alpha_3 \delta_3$). The indirect impacts are captured by $\beta_2 \alpha_1$ and $\gamma_2 \alpha_2$, working through trade and specialization, respectively.

3.4.2 Data Description

This essay investigates the business cycles behaviour within two samples. The first, unbalanced data, includes members of the GCC and 18 of their major trading partners.[64] Major trading partners have been included in order to control for the

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[63] Rose (2000) Frankel and Rose (2002) and Glick and Rose (2002) argue about the importance of controlling for regional/currency union membership in the gravity model.
[64] See Appendix 3.A for list of countries.

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possibility that two countries are correlated mainly because of integration with a third country. The second group will consist of the GCC countries only.

The data sample will be based on yearly observations from 1981 to 2004 and will be divided into 6 sub-sample periods, each period consisting of 4 years. [65] Business cycles synchronization is measured using the correlation between yearly real GDP series filtered using the Hodrick-Prescott (HP) Filter. GDP data are obtained from the World Bank's World Development indicators. Some studies have applied different measures of economic activities such as the industrial production index and total employment and unemployment rates. Such indexes can't be applied owing to data unavailability.

Bilateral trade intensity is employed using two different proxies:

$$1. \quad T_{ijt}^1 = \frac{(X_{i,j,t} + M_{i,j,t})}{(GDP_{i,t} + GDP_{j,t})}$$

$$2. \quad T_{ijt}^2 = \frac{(X_{i,j,t} + X_{j,i,t})}{(X_{i,t} + X_{j,t})}$$

where $X_{i,j,t}$ denotes nominal export value from country i to j during period t; $M_{i,j,t}$ denotes total imports of country i from country j; $X_{i,t}$ denotes total exports from country i to the world; and finally, *GDP* denotes nominal GDP values. The first measure is similar to the measure used by Frankel and Rose (1998). Bilateral trade data are obtained from the United Nation COMTRADE database.

Similarity in pattern of specialization, $S_{i,j,t}$, is calculated by following Krugman's (1991) absolute value index:

$$S_{i,j,t} = \sum_{n=1}^{N} |s_{ni} - s_{nj}|.$$

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[65] 1981-1984 (period 1), 1985-1988 (period 2), 1989-1992 (period 3), 1993-1996 (period 4), 1997-2000(period 5), 2001-2004 (period 6)

where s_{ni} and s_{nj} denote the GDP shares for industry n in country i and j. $S_{i,j}$ reaches its maximal values for two countries when there are no sectors in common. Thus, the more similar two countries are in terms of specialization, the smaller is the value of this index. Annual data (1981-2004) on GDP shares are obtained from the United Nations common database using one-digit sectoral value-added data for all sectors in the economy.[66] The sectors in the economy are classified according to the following:

- Agricultural, hunting, forestry, fishing;
- Mining and quarrying;
- Manufacturing;
- Electricity, gas and water supply;
- Construction;
- Wholesale, retail trade, repair of motor vehicles, motorcycles and personal and household goods;
- Transport, storage and communications
- Financial intermediation, real estate, renting and business activities
- Other activities.

While measures of trade intensity and specialization are quite straightforward, measures for financial openness are generally harder to construct. The bilateral financial openness index will be estimated based on capital account restrictions information published on the IMF's *Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER)*. Starting from the 1996 edition, the IMF divides capital account transactions into 13 subcategories, resulting in much more suitable capital control measures.[67] To construct dummies in each category for editions prior to 1996, I follow the methodology suggested by Miniane (2004), where text information is used to complete as many of the 13 subcategories as possible. An additional category is added to control for the presence of a special capital account access granted to GCC members only, which enforces the bilateral property of the

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[66] See tables 3.5-3.10 for percentage of sector contribution to GDP.

[67] Composed of capital market securities, money market instruments, collective investment securities, derivatives and other instruments, commercial credits, financial credits, guarantees, sureties, and financial backup facilities; direct investment, liquidation of direct investment, real estate transactions, personal capital movements, provisions specific to commercial banks and other credit institutions; and provisions specific to institutional investors.

index. More detailed explanation about the index construction is presented in appendix 3.B. Unlike the measures of trade intensity and specialization, caution is required when interpreting impacts of financial openness as the index is a *de jure* measure. Overall, GCC countries still impose different forms of control and restriction where Bahrain is considered to be least restrictive and Saudi Arabia to be most restrictive.

3.4.3 Empirical Evidence

Before moving to the regression results, Tables 3.2-3.4 show a summary of average statistics for the main variables of interest and the correlation among them, respectively. The correlation between 'GDP correlation' and 'trade' is positive and supports the assumption of positive interaction between trade and business cycles synchronization. The negative correlation between trade and specialization supports the assumption that higher trade induces specialization in different sectors.

Unexpectedly, specialization is positively correlated with the output synchronization, which does not follow the assumption that higher differences are associated with less output correlation. The correlation is even higher within the GCC sample. Financial openness and output correlation are positively correlated within both samples, supporting the argument that higher financial openness is associated with more synchronized output. Trade and financial openness show a logical correlation when looking at the GCC sample, where trade intensity and financial openness are related positively, but negatively correlated within the full sample.

Table 3.11 - Columns (a) and (b) - presents the empirical estimation of the simultaneous system of equations (3.1-3.4) for the full and GCC samples, respectively.

3.4.3.1 The direct impact of trade, specialization, and financial openness

Trade intensity has the expected positive impact on business cycles correlation, which is broadly consistent with those in the empirical literature. For instance, Frankel and Rose (1998) report trade coefficient that range between 0.047 and 0.113, while Imbs

(2004) has coefficient ranges between 0.057 and 0.116.[68] The result implies that GCC members and their trading partners would experience a more synchronized business cycle as they trade more. In other words, the coefficient estimate, 0.075, implies that doubling trade will raise output synchronization by 0.05.

Direct impact of specialization in equation (3.1), is negative and highly significant, showing that more specialized countries tend to experience less synchronized outputs. In other words, GCC members and their major trading partners would experience higher synchronized outputs as they experience similar patterns of specialization. A similar conclusion is obtained by Imbs (2001, 2004).

Financial openness is showing a positive association with more synchronized business cycles. Outputs of the GCC members with more open financial systems are associated with higher correlation with other countries' outputs. Financial openness can be partially viewed as a trend toward risk-sharing which has been argued to contribute to lower output volatility, therefore leading to higher outputs synchronizations among countries. The result is also in support of arguments that lower capital account restrictions and development of the domestic financial market are contributing to lower output volatility. [69] Overall, the impact of trade, specialization and financial openness are similar to those reported by Imbs (2004, 2006).

3.4.3.2   The indirect impact of trade, specialization, and financial openness

While trade has shown a positive association with output synchronization, indirect impact of trade, working via specialization in equation (3.3), turned out positive and significant, though small. This result implies that there is a trade-induced specialization, therefore contributing to less synchronization of business cycles. The impact of trade on specialization is in line with the argument proposed by Eichengreen (1992) and Krugman (1993) that higher trade would lead to higher specialization, and therefore to lower business cycles synchronization. In equation (3.4), trade seems to have an ambiguous relationship with financial openness. Trade turned out to have the wrong, negative, impact on financial openness, when it is

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[68] Also see Clark and van Wincoop (2001) and Kose and Yi (2002) for further similar results.
[69] See Easterly *et al.* (2001), Kalemli-Ozcan *et al.* (2003), Kose *et al.* (2003) and Schiavo (2008)

assumed that trade relations may promote financial openness. This is not unexpected and can be clarified by the significant sign on the GCC dummy, showing that less restriction on capital transactions are granted to GCC members, regardless of trade connections.

Equation (3.2) presents the indirect impacts of specialization working through trade, which is in line with the argument proposed by Krugman (1993), but opposite to the finding in Imbs (2004) in terms of the direction of the impact. A positive, large, and highly significant coefficient on specialization implies the prevalence of inter-industry over intra-industry trade, where GCC countries and their trading partners tend to trade more as they became more specialized in different sectors. The resulting increase in trade intensity is expected to encourage higher output synchronization. It is interesting that the specialization's indirect impact on trade mitigates its direct negative impact on synchronization. The result is logical given the major differences between the GCC's exports and imports which are mainly from the oil and non-oil sectors, respectively.[70]

Financial openness within the trade equation turned out to be negative, which is unexpected. A logical explanation could be the fact that higher levels of financial openness are granted to other GCC members, which trade less among themselves than with their major trading partners. Within the specialization equation, financial openness is showing a positive association with higher specialization, which therefore translates into lower output synchronizations.[71] In other words, the results can be interpreted as suggesting that access to foreign capital is being used as an insurance against production risk and therefore enhancing specialization in different sectors. However, the impact of financial openness should be interpreted with caution as the measure is a *de jure* rather than a *de facto* measure. More discussion will be devoted to this issue in the robustness analysis.

The regional dummy, GCC, in equation (3.1) returned negative sign, though insignificant, which potentially indicate lower output synchronization between the

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[70] Calderon *et al.*(2007) found that the similarity of economic structures explain about 40percent of the difference in the impact of trade intensity on business cycles synchronization between industrial and developing countries.

[71] The finance-induced specialization is in line with the results presented in Kalemli-Ozcan *et al.*(2001,2003).

GCC countries than between the GCC and their trading partners. The insignificance of the regional dummy goes inline with the findings of Baxter and Kouparitsas (2005) who argue that currency union is not a robust predictor of business-cycles correlation.[72] The GCC's negative and insignificant sign is not unexpected given the findings of the earlier GCC literature that claimed a low or zero correlation among their outputs and supply shocks. For GCC countries where output is dominated by production of oil, changes in the price of oil would represent a shock on both aggregate supply and aggregate demand. When prices of oil increase, it is likely to impact the supply side by raising the incentive to produce more oil, while impacting the demand side by raising real income, expenditures and imports. When oil prices drop, on the other hand, the demand side may not necessarily experience a negative shock since GCC countries mostly rely on fiscal policy instruments to deal with shocks. Each country may pursue different fiscal polices to insure its economy against negative shocks, which then lead to different speeds of adjustment. This argument finds support in Fasano and Wandg (2001) who argue that the timing, extent and rules of spending differ across the GCC, which leads to different patterns. Similarity, Sturm and Siegfried (2005) find a slow fiscal convergence among the GCC countries. In a recent contribution, Alabdulwahab (2008) concludes that the GCC countries face symmetric oil shocks, but a low correlation among supply shocks.

Although there is a lack of direct association between the GCC membership and output synchronization, the GCC dummy shows highly significant signs within the remaining equations. As expected, the GCC dummy is positive and highly significant within the trade equation, implying a higher trade intensity among the GCC members. Within the specialization equation, the GCC dummy clearly captures the fact that GCC members are mainly oil producers which translates into higher similarities (low S), which then contributes to higher output synchronization. Finally, the estimate for equation (3.4) shows that members of the GCC are granted higher financial openness, which indirectly raises the positive impact of financial openness on the synchronization of the business cycles.

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[72] Baxter and Kouparitsas (2005) investigate the determinants of business cycles comovement between countries using dataset of over 100 countries, both developed and developing.

Most of the exogenous variables in the four equations turned out to be significant. The variable measuring the fluctuation in oil prices in equation (3.1) is positive, indicating an association between oil price fluctuations and output synchronizations. In other words, the output for GCC countries and their trading partners tend to correlate more as fluctuation in oil prices increases. The product of oil share in the country pairs turned out to be insignificant.

In equation (3.2), most of the gravity variables are highly significant. Exporter's GDP is positive, supporting the positive association between higher income and higher trade, while exporter's population is showing a negative association with trade, which indicates a tendency to trade less as the country size increases.[73]

In equation (3.3), the gap between the GDP per capita between country pairs, controlling for differences in stage of development, is highly significant but retains an unexpected sign, showing that higher differences in income per capita between country pairs, at different stages of development, are associated with fewer structural differences. On the other hand, the product of GDP per capita between pairs indicates less difference as the incomes increase for both pairs.

For the financial openness equation, GDP per capita is positive and highly significant indicating that financial openness follows development, as measured in terms of income. Finally, a positive and significant coefficient on the share of oil implies an association with higher openness in the financial system. It would have sounded more logical to argue that a falling share of oil would motivate a country to lower restrictions on its financial systems in order to attract foreign funds. More attention will be devoted to this issue in later estimates.

In summary, the above results show that, among the factors of interest, it is the different patterns of specialization that induce the highest impact on business cycles synchronization, both directly and indirectly. Though smaller in magnitude, trade does show a significant association with positive synchronization both directly and indirectly. Higher financial openness implies a rise in output synchronizing as well as

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[73] Bergstrand(1989) and Baier and Bergstrand (2002) argue that a rise in population in both exporter and importer countries reduces the capital–labour endowment ratios of both countries. If exports are capital-intensive, a higher population would be associated with lower trade (relative to national outputs).

promoting specialization in deferent sectors. The following is a further analysis within the GCC sample.

3.4.3.3 Business cycles synchronization among the GCC countries

Analysing the business cycles synchronization among the GCC countries would provide another picture about the impact of trade, specialization and financial openness. The analyses in this context would be interesting in terms of examining the direct as well as indirect impact of these factors on output synchronization, providing more insight into how each factor would contribute to business cycles synchronization. In general, results have changed in most of the equations.

The most remarkable change was on the impact of trade in equation (3.1), where the coefficient has turned negative, but is no longer significant. Such a result is not unexpected and it is mainly because bilateral trade among GCC countries is quite small relative to GDP and relative to total trade; it therefore has limited impact on business cycles synchronization. The weak association between trade and business cycles can be also be explained by the work of Kose and Yi (2004) who retain the weak impact from trade on both the country's size and trade's size. They argue that the association between higher trade and output co-movement would be lower among smaller countries. In addition, when trade is small among country pairs compared to trade with the rest of the world, then a large percentage increase in trade intensity does not translate into a large increase in absolute terms. Therefore, it is not surprising that an increase in trade may not have an impact on output synchronization, given the size of GCC countries and trade among them. Another explanation could pertain to the fact that all GCC members are developing countries, where the association between trade and business cycles synchronization is expected to be weak (Calderon et al., 2007).[74] Further explanation will be discussed below.

The direct impact of specialization returned the same direction of impact with slightly larger size. Higher differences in specialization among GCC countries are contributing to less synchronized business cycles. In other words, pursuing different

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[74] Calderon *et al.*(2007) perform an empirical analysis of the association of trade intensity and business cycles synchronization for a sample of 147 developed and developing countries. Their result shows a weak impact of trade when analyzed within a sample of developing countries.

paths in specialization may lower the feasibility of forming a common currency area as different countries would probably experience unsynchronized business cycles.

The coefficient on the financial openness in equation (3.1) shows the same positive sign, but smaller and no longer significant, implying it is not efficient or high enough to have a direct impact on output synchronization among the GCC countries. Another logical explanation for the insignificant result could be the limitation of the constructed financial openness measure as it is a *de jure* rather than a *de facto* measure. Later estimates would provide more insights about the robustness of the financial openness index.

Looking at the indirect impact, trade continues to associate significantly with different patterns of specialization, contributing to an indirect negative impact on the output correlation among the GCC members. This implies that higher intensive bilateral trade is contributing to different patterns of specialization among the GCC countries. A useful strategy, which needs further research, is to stimulate an intra-industry trade that would contribute to higher similarities and, therefore, synchronized business cycles.

Unlike its impact within the full sample, trade is now associated with a positive impact on financial openness, which follows the expectations of this paper. A country would be motivated to lower restrictions on its capital market as trade becomes more intense with its trading partner. This goes in line with the argument presented by Obstfeld and Rogoff (2000) that goods markets may partially explain the functioning in the cross-border capital market.

The impact of specialization, working through trade, continues to stress the prevalence of inter-industry over intra-industry trade. Such a result implies that GCC countries trade more as they become specialized in different industries. Furthermore, it goes in line with the fact that non-oil goods dominate bilateral trade among GCC countries. This result provides a partial explanation of why trade is having a weak association with business cycles synchronization, where empirical evidence suggest

that the impact of trade on synchronization would be higher for countries with a higher share of intra-industry trade.[75]

Financial openness working through trade is now returning a positive but no longer significant. Although nationals of the GCC countries are granted exclusive treatment in conducting business within the GCC, financial openness seems to have no impact on trade.[76] One explanation for the insignificance of the finance openness index could be because the decision to lower capital restrictions by one country is granted to all other GCC members regardless of trade connections. Unlike its effect within the full sample, it seems that placing fewer restrictions on capital transactions has no significant association with patterns of specialization. Focusing on the direction of impact, the negative sign is in line with the argument by Krugman (1993) that specialization according to comparative advantage is enhanced by access to finance.

Overall, specialization is the only factor associated directly with the business cycles synchronization among the GCC countries. Higher differences in the patterns of specialization are highly associated with asymmetric output correlation. Trade, on the other hand, is showing a significant impact working through specialization, which translates into negative impact on output synchronization. Financial openness, on the other hand, is not showing any significant association with output synchronization, either directly or indirectly. Both of the trade and specialization impacts are in line with standard predictions of most classical trade models based on Ricardian and Heckscher-Ohlin. These theories argue that as countries trade more, they tend to specialize according to their comparative advantage.[77] If business cycles are driven by industry-specific shocks, then their impacts are contributing to lower output synchronization.

3.4.4   Sharing similar trading partners: is there is an impact?

The above result shows that trade and specialization channels are significantly associated with output synchronization, either directly or indirectly. Many of the GCC

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[75] See Calderon *et al.*(2007).
[76] Caution is required regarding this interpretation as the decision to lower capital restrictions by one country is granted to all other GCC members regardless of trade connections.
[77] See Dornbusch et al.(1997) for instance.

countries share the same trading partners such as the U.S, Japan and Korea. Table 3.A.2, appendix 3.A, presents the top four trading partners for the GCC countries, showing that Japan and Korea are among the major trading partners for all the GCC countries. It is possible, however, that a pair of countries has higher synchronized outputs, not because of their bilateral trade, but because both trade more with the same trading partners. If this is the case, the impact of trade on output synchronization would suffer from positive omitted variable bias, as suggested by Kose and Yi (2004).

In addition, specialization across a pair of countries may not be fully driven by a high volume of trade between them, but because of a high volume of trade with similar trading partners. Therefore, the measure of bilateral trade intensity might give a biased indication of the relation between bilateral trade and specialization. Earlier empirical work by Frankel and Rose (1998) and Imbs (2004), don't control for the impact of sharing similar partners, which could mean a bias in their estimates.

A bilateral measure of dissimilarity of trade partners (*DTP*) will be added to equations (3.1) and (3.3) in order to complement the trade intensity impact on output synchronization and specialization as follows:

$$\rho_{i,j,t} = \alpha_0 + \sum_{t=2}^{T}\theta_t + \alpha_1 T_{i,j,t} + \alpha_2 S_{i,i,t} + \alpha_3 F_{i,j,t} + \alpha_4 GCC_{i,j} + \alpha_5 DTP_{i,j,t}$$
$$\alpha_6 I_{1,i,j,t} + \varepsilon_{1,i,j,t} \tag{3.5}$$

$$T_{i,j,t} = \beta_0 + \sum_{t=2}^{T}\theta_t + \beta_1 S_{i,j,t} + \beta_2 F_{i,i,t} + \beta_3 GCC_{i,j} + \beta_4 I_{2,i,j,t} + \varepsilon_{2,i,j,t} \tag{3.6}$$

$$S_{i,j,t} = \gamma_0 + \sum_{t=2}^{T}\theta_t + \gamma_1 T_{i,j,t} + \gamma_2 F_{i,j,t} + \gamma_3 GCC_{i,j} + \gamma_4 DTP_{i,j,t} +$$
$$\gamma_5 I_{3,i,j,t} + \varepsilon_{3,i,j,t} \tag{3.7}$$

$$F_{i,j,t} = \delta_0 + \sum_{t=2}^{T}\theta_t + \delta_1 T_{i,j,t} + \delta_2 GCC_{i,j} + \delta_3 I_{4,i,j,t} + \varepsilon_{4,i,j,t} \tag{3.8}$$

where *DTP* is a measure of dissimilarity of trading partners between two countries, country 1 and country 2, which is calculated as follows:

$$DTP_{1,2,t} = \sqrt{\sum_{j=1}^{N} (T_{1j,t} - T_{2j,t})^2}$$

where *T* represents trade intensity as defined earlier, j represents major trading partners of the GCC countries and t indicates time.[78] This measure will get larger as a pair of countries trade more with different trading partners, and will reach a minimum value of zero when two countries experience the same trade intensity with the same trading partners. The dissimilarity of trade partners measure will be established among the GCC countries only, as the main interest of this essay is to understand the determinants of business cycles synchronization among the GCC countries. It is expected that sharing higher trade with the same major trading partners will translate into higher synchronized outputs. A positive or negative shock in any of the trading partners is expected to translate in a similar way to its partners. Similarities across countries are expected to react positively to sharing common trading partners.

Estimation results in Table 3.11, column (c), show that the measure of dissimilarity of trading partners is negative and significant, implying that trading more with different trading partners, high (*DTP*), is associated with lower synchronized business cycles. The result is logical and follows earlier expectations that sharing similar trading partners means exposure to similar shocks.

Controlling for the dissimilarity of trading partners in the specialization equation reveals its significance, though the sign is unexpected. Sharing high trade with different trading partners is associated with higher similarities across a pair of countries. In other words, similarities across pairs of countries are expected to increase as they trade more with different trading partners. Controlling for dissimilarity of trading partners leads to about a 25 percent reduction in the trade coefficient, indicating a slightly biased estimate of trade in earlier regression. It would be an interesting empirical exercise to further investigate the role played by sharing similar trading partners in patterns of specialization and output co-movement, but this would be beyond the aim of this essay.

Though insignificant within the GCC sample, financial openness has shown a change in its sign within the trade and specialization equation, which raises additional caution about its robustness.

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[78] Trading partners include all participating countries defined in appendix 3.A.

3.5 Robustness

In order to test for robustness of earlier results, an alternative measure of output synchronization and trade intensity are applied. As described earlier in the data description, the alternative measure of trade intensity will take the following form:

$$T_{ijt}^2 = \frac{(X_{i,j,t} + X_{j,i,t})}{(X_{i,t} + X_{j,t})}$$

where $X_{i,j,t}$ denotes nominal export value from country i to j during period t; $X_{i,t}$ denotes total exports from country i to the world.

The alternative constructed output correlation will be based on yearly observations divided into 4 subsample periods, each period consisting of 6 years, instead of 4 years.[79] Real GDP series are filtered using the Hodrick-Prescott (HP) Filter.

The results in Table (3.12) replicate the same specification in Table (3.11), but using the alternative measure of trade intensity, T^2. The result confirms the positive and significant role of trade within the full sample, column (a), while still showing an insignificant role within the GCC sample in column (b). Within the specialization and financial openness equations, the role of trade is very similar to pervious estimates. Specialization continues to be an important factor within the full and GCC samples, both economically and statistically. Financial openness is still significantly associated with higher output synchronization within the full sample, as well as within the specialization equation. Similarly to the results in Table 3.11, financial openness shows no sign of impact within the GCC sample.

Table (3.13) presents the estimates using output synchronization over 4 periods, which reveal partial changes. Trade confirmed its positive association with output synchronizations, as well as its association with higher specialization within the full sample. The results remain the same within the GCC sample, where higher trade is robustly associated with higher specialization.

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[79] 1981-1986 (period 1), 1987-1992 (period 2), 1993-1998 (period 3), 1999-2004 (period 4).

The major change within this estimate is in the direct impact of specialization on output synchronization. It loses significance and returns a different sign with smaller coefficient, which might be caused by the reduced number of observations. However, the role of specialization is still robustly significant within the GCC sample, confirming its major role in determining the co-movement of business cycles. Within the trade equation, the results confirm a robust association between a higher pattern of specialization and higher trade in both full and GCC samples.

Financial openness confirms its robust direct associations with output synchronization, trade and specialization equation. Within the GCC sample, the estimates confirm earlier results of weak association between finance and output synchronization, as well within the trade and specialization equations. The result re-emphasizes the need for caution when interpreting the impact of financial openness in addition to the need to construct a *de facto* measure that reflects a better impact of financial openness.

Finally, the measure of dissimilarity of trading partners is not showing a significant impact with output synchronization, but still returns the same level of significance within the specialization equation.

3.6 Conclusion

This paper investigates the determinants of business cycles synchronizations, focusing on the role of trade, specialization and financial openness. These factors are estimated using a system of simultaneous equations, which allows for identifying the direct as well as indirect impact of trade, specialization and financial openness. Trade has been shown to be a major channel for transmitting shocks across GCC countries and their trading partners, where the link is robustly positive. The specialization index is found to be an important channel impacting business cycles synchronization, but didn't pass the robustness test within the full sample. Controlling for financial openness reveals that most of its impact is direct. Higher financial openness is associated with higher output co-movement between GCC countries and their major trading partners.

Within the GCC sample, specialization has been shown to be the only channel associated directly with the co-movement of outputs. Unlike in many studies, trade

has shown no direct association with output synchronization, but does show an indirect impact through its association with higher specialization across the GCC. The process of financial openness has not shown any sign of association with the output synchronization, while showing no support for robust indirect impact.

An interesting finding in this paper is the prevalence of inter-industry over intra-industry trade in driving output synchronization, while higher trade is found to drive different patterns of specialization across countries. It would be an interesting empirical question to investigate which impact, higher trade or higher specialization, would dominate. An index measuring how much GCC countries trade with different trading partners revealed a positive association between sharing similar partners and higher output co-movement.

This research provides an important contribution to the debate on the GCC integration process, with the aim of launching a single currency by 2010. More research is needed to fully understand the role of trade, specialization and financial openness on business cycles synchronization among the GCC countries. Furthermore, the large government size and expenditure are expected to play and important role in output synchronization within the GCC. Understanding how these expenditures are associated with output growth and non-oil output in particular, would be an important empirical exercise for understanding the role of government in output synchronization among the GCC.[80] Upon availability, new measures of output such as unemployment and industrial production should be applied. In addition, more effective financial openness indices based on a *de facto* measure should be applied in order to better understand the role of financial openness.

An important area of future research would be to review the reaction of labour market in the face of output fluctuations. This is mainly due the unique status of the GCC labour market, which is an important employer of foreign labour. For instance, foreign labour accounts for about 80 percent of total employment in Kuwait, Qatar and UAE, while about 55 percent in Bahrain(Buiter, 2008). The main characteristic of the foreign labour market within the GCC is their high mobility and flexibility to

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[80] For more details about the contribution of governments expedites on economic growth, as well as non-oil sector growth, see Al-obaid Al-Yousif (2000), Treichal (1999), Ghali and Al-Shamsi (1997), Chalk(1997) and Fasano and Wang (2001).

adjust in the face of output shocks. On the other hand, the public sector is considered the main source of employment for national citizens, which is characterized by low adjustment flexibly. Furthermore, data on migration between the GCC countries, though unavailable, may reveal an important role for the migration channel which is expected to interact with asymmetric shocks.

Table 3.1.1 – Real GDP Correlation+ (1981- 1984)

Country	Bahrain	Kuwait	Oman	Qatar	Saudi Arabia	UAE
Bahrain	1					
Kuwait	0.962*	1				
Oman	0.153	0.393	1			
Qatar	0.631	0.599	0.389	1		
Saudi Arabia	0.322	0.056	-0.864	0.921	1	
UAE	0.723	0.570	-0.088	0.871	0.556	1

Table 3.1.2 – Real GDP Correlation+ (1985- 1988)

Country	Bahrain	Kuwait	Oman	Qatar	Saudi Arabia	UAE
Bahrain	1					
Kuwait	-0.221	1				
Oman	-0.855	-0.184	1			
Qatar	0.776	-0.158	-0.889	1		
Saudi Arabia	0.214	-0.462	-0.329	0.715	1	
UAE	-0.203	-0.249	0.616	-0.749	-0.734	1

Table 3.1.3 – Real GDP Correlation+ (1989- 1992)++

Country	Bahrain	Kuwait	Oman	Qatar	Saudi Arabia	UAE
Bahrain	1					
Kuwait	--	1				
Oman	-0.014	--	1			
Qatar	-0.364	--	0.937**	1		
Saudi Arabia	0.892*	--	-0.417	-0.701	1	
UAE	0.134	--	-0.931*	-0.914*	0.5642	1

++Kuwait is excluded in this period due to the event of Kuwait invasion in 1990

Table 3.1.4 – Real GDP Correlation+ (1993- 1996)

Country	Bahrain	Kuwait	Oman	Qatar	Saudi Arabia	UAE
Bahrain	1					
Kuwait	-0.282	1				
Oman	0.661	0.367	1			
Qatar	0.966**	-0.028	0.808	1		
Saudi Arabia	0.932**	-0.358	0.390	0.858	1	
UAE	-0.947**	0.160	-0.545	-0.928*	-0.977**	1

Table 3.1.5 – Real GDP Correlation+ (1997-2000)

Country	Bahrain	Kuwait	Oman	Qatar	Saudi Arabia	UAE
Bahrain	1					
Kuwait	0.946**	1				
Oman	0.996***	0.957**	1			
Qatar	0.5653	0.7841	0.573	1		
Saudi Arabia	0.928*	0.892*	0.894*	0.665	1	
UAE	0.7871	0.8371	0.8421	0.5077	0.54	1

Table 3.1.6 – Real GDP Correlation+ (2001- 2004)

Country	Bahrain	Kuwait	Oman	Qatar	Saudi Arabia	UAE
Bahrain	1					
Kuwait	0.923*	1				
Oman	-0.96**	-0.7931	1			
Qatar	-0.672	-0.3551	0.8496	1		
Saudi Arabia	0.890	0.996***	-0.7387	-0.2733	1	
UAE	0.888	0.99***	-0.7283	-0.2574	0.997***	1

+ Represent correlation between real GDPs on the basis of Hodrick-Prescott filter

***,**,* represent signficant level at the 1%, 5% and 10%, signficnantly

Table 3.2: Summary statistics

	Variable	Mean	Min	Max	Std. Dev	Observation
All countries	Output Correlation	0.031	-0.998	1.000	0.679	800
	Trade Intensity	0.002	0.000	0.026	0.003	828
	Specialization	0.080	0.023	0.138	0.025	762
	Financial Openness	0.454	0.214	0.893	0.219	828
GCC only	Output Correlation	0.193	-0.977	0.997	0.662	170
	Trade Intensity	0.003	0.000	0.026	0.004	180
	Specialization	0.051	0.023	0.118	0.022	180
	Financial Openness	0.484	0.214	0.893	0.230	180

Table 3.3: Summary of means by period

	Variable	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6
	Output Correlation	0.355	0.021	-0.142	-0.123	-0.004	0.040
All countries	Trade Intensity	0.002	0.002	0.002	0.002	0.002	0.002
	Specialization	0.093	0.076	0.075	0.077	0.077	0.081
	Financial Openness	0.416	0.374	0.386	0.442	0.563	0.544
	Output Correlation	0.357	-0.181	-0.081	0.072	0.781	0.117
GCC only	Trade Intensity	0.003	0.003	0.003	0.004	0.003	0.004
	Specialization	0.047	0.051	0.051	0.053	0.053	0.053
	Financial Openness	0.423	0.393	0.414	0.470	0.607	0.595

Table 3.4: Correlation among major variables

	GDP correlation+	Trade	Specialization	Financial openness
GDP correlation	1			
Trade	0.061*	1		
Specialization	0.044	-0.144***	1	
Financial openness	0.077**	-0.024	0.021	1

GCC only				
	GDP correlation+	Trade	Specialization	Financial Openness
GDP correlation	1			
Trade	-0.147*	1		
Specialization	0.165**	-0.124*	1	
Financial openness	0.063	0.069	-0.072	1

+ Represent correlation between real GDPs on the basis of Hodrick-Prescott filter.

***,**,* represent significance level at the 1%, 5% and 10% levels, respectively.

Table 3.5: Percentage of sectors contribution to GDP, Bahrain

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Agriculture	0.98	1.01	1.06	1.15	1.12	1.19	1.43	1.37	1.19	1.15	0.95	0.92	0.89	0.91	0.86	0.86	0.92	0.88	0.90	0.84	0.73	0.74	0.66	0.60	0.48
Mining	34.83	33.04	29.36	24.95	24.22	28.21	18.55	18.03	14.10	16.49	20.85	17.77	16.29	15.67	14.29	15.37	18.13	18.68	13.59	18.24	28.06	24.82	24.69	24.95	23.55
Manufacturing	16.22	15.51	12.41	11.91	12.45	10.11	14.31	16.37	18.42	16.90	16.72	16.65	15.09	12.30	14.52	17.55	14.69	14.70	12.73	12.33	11.44	12.01	11.81	11.11	10.60
Electricity	1.04	1.19	1.39	1.57	1.67	1.86	1.82	1.88	1.81	2.02	1.91	1.73	1.68	1.57	1.43	1.55	1.57	1.63	1.89	1.81	1.43	1.44	1.39	1.37	1.23
Construction	6.99	8.06	9.72	9.77	10.67	9.74	8.96	7.44	7.04	6.38	6.25	5.75	5.66	5.35	5.26	4.87	4.32	3.94	4.04	4.26	3.57	3.99	4.22	3.81	3.69
Wholesale	11.68	10.72	11.58	12.62	9.66	8.70	9.50	10.10	10.58	9.98	9.82	10.57	13.72	12.87	14.43	13.23	12.64	11.31	12.43	10.61	10.01	10.63	11.18	10.58	12.15
Transportation	8.73	9.61	11.56	13.05	12.41	12.08	12.89	12.00	11.50	11.10	9.31	12.09	8.22	7.94	8.03	7.41	7.24	7.08	8.30	7.87	7.04	7.51	7.84	7.21	7.27
Finance	14.23	19.38	25.55	25.36	25.80	23.79	23.29	18.56	22.64	21.07	18.11	17.26	28.43	30.77	30.63	28.24	30.12	31.76	34.24	32.38	30.46	28.25	27.14	29.97	33.64
Other	5.28	1.47	-2.63	-0.38	2.00	4.31	9.26	14.25	12.71	14.92	16.09	17.26	10.03	12.61	10.56	10.91	10.37	10.01	11.87	11.65	7.24	10.60	11.08	10.39	7.39

Source: UN common database.

Table 3.6: Percentage of sectors contribution to GDP, Kuwait

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Agriculture	0.19	0.34	0.37	0.3	0.44	0.6	0.77	0.48	0.49	0.66	0.88	0.29	0.26	0.29	0.42	0.43	0.39	0.4	0.45	0.43	0.35	0.45	0.52	0.47	0.43
Mining	65.6	58.5	44.5	49.8	52.9	49.4	32.3	37.1	29.8	39	39.5	10.7	30.9	41	38.4	39.6	43.8	39.5	29.8	36.3	47.9	42.9	38.2	42.2	47.7
Manufacturing	5.51	5.9	5.05	5.98	4.81	5.94	11.5	12.9	13.5	14	11.6	4.95	8.98	8.77	10.6	11.2	11.7	13.2	11.7	11.1	6.91	6.35	7.83	7.82	8.01
Electricity	0.95	2.37	3.72	3.55	2.8	2.36	1.25	0.48	0.4	0.38	0.69	1.95	1.29	0.8	0.6	0.4	1.26	1.61	2.91	2.58	2.13	2.36	2.37	2.17	1.9
Construction	3.58	3.74	4.22	4.49	4.22	4.02	3.48	2.52	2.41	1.88	1.82	6.1	3.6	3	3.23	3.08	2.55	2.56	2.92	2.62	2.2	2.45	2.69	2.42	2.2
Wholesale	7.67	9.43	11.9	9.01	8.78	8.81	10.7	9.48	11.4	9.13	7.58	16.8	10.8	8.52	7.96	7.81	6.65	6.86	8.45	7.56	6.02	6.68	8.17	7.7	7
Transportation	2.33	3.05	4.7	4.49	4.16	4.2	5.05	4.06	4.9	4.14	3.68	2.97	4.65	4.47	4.93	4.57	4.12	4.33	5.46	5.31	4.77	5.73	5.13	4.97	4.34
Finance	6.74	8.94	18.8	13.8	11.3	12.5	14.8	14	15.5	12.4	13.5	19.8	12.9	11.6	11.8	11.4	10.2	11.8	14.6	13.6	13.3	15.1	16.6	15.4	14.1
Other	7.39	7.69	6.66	8.61	10.6	12.2	20.2	19	21.6	18.5	20.8	36.4	26.6	21.6	22.1	21.5	19.4	19.7	23.7	20.6	16.4	18	18.5	16.9	14.3

Source: UN common database.

Table 3.7: Percentage of sectors contribution to GDP, Oman

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Agriculture	2.69	2.56	2.61	2.75	2.43	2.26	2.91	3.16	3.4	3.14	.	3.67	3.25	2.4	0.03	2.78	2.5	2.62	2.83	2.63	1.96	2.05	2.09	1.95	1.7
Mining	60.6	58.8	54.4	50.8	48.7	49.8	40.2	46.1	39.7	43.5	.	42.6	42.7	37.3	36.8	38.3	42.2	40.4	31.2	39.4	48.9	42.8	41.9	41.4	42.4
Manufacturing	0.64	0.92	1.28	1.76	2.04	2.2	3.09	3.05	3.49	3.49	.	4.3	4.31	4.21	4.34	4.66	4.04	3.95	4.64	4.34	5.43	8.32	7.7	8.27	8.14
Electricity	0.46	0.53	0.58	0.68	0.72	0.77	0.97	1.02	1.09	1.02	.	1.6	1.53	0.88	0.99	0.92	0.91	1.09	1.25	1.18	1.02	1.04	1	1.29	1.49
Construction	5.24	5.76	6.35	7.08	7.89	6.21	6.71	3.86	3.59	2.82	.	3.94	4.04	3.29	3.01	2.59	2.21	3.18	3.73	2.34	1.9	2.08	2.14	2.33	3.05
Wholesale	8.29	9.11	10.3	10.8	11.1	11.3	11.8	10.1	12.8	11.8	.	13.8	13.9	13.8	13.4	13.7	13.2	13.6	16.5	13.7	11.4	12.2	12.6	12.6	13
Transportation	3.07	3.38	3.83	3.92	4.03	4.14	4.83	4.44	5.07	4.93	.	3.74	3.64	5.97	6.27	6.27	6.2	6.86	8.29	7.22	5.9	6.52	6.94	6.92	6.98
Finance	9.43	8.47	8.77	8.75	8.43	8.01	10.1	9.49	10.4	9.91	.	1.4	1.48	0.76	0.65	0.67	0.8	1.94	1.41	0.99	0.69	1.03	1.21	1.29	1.16
Other	9.61	10.5	11.8	13.5	14.7	15.3	19.3	18.7	20.4	19.4	.	24.9	25.1	31.4	34.6	30.1	27.9	26.4	30.2	28.2	22.8	23.9	24.4	24	22

Source: UN common database.

Table 3.8: Percentage of sectors contribution to GDP, Qatar

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Agriculture	0.52	0.54	0.69	0.83	0.82	0.95	1.29	1.2	1.06	0.91	0.78	0.95	0.89	1.08	1.05	0.98	0.88	0.71	0.69	0.58	0.37	0.37	0.25	0.27	0.2
Mining	67.1	63.9	54.1	45.7	45.3	42.8	29.3	29.6	25.4	30.1	38	32.5	35.8	32.6	32	36.9	38.7	42.3	34.8	40.7	60.4	57	56.8	57.6	62.2
Manufacturing	3.29	4.72	5.02	6.2	7.31	7.9	9.66	10.6	14.3	14.1	12.9	13.3	12.7	11.1	11	8.4	7.58	8.31	7.87	6.36	5.44	6.05	7.07	6.86	6.29
Electricity	0.22	0.26	0.32	0.56	0.66	0.85	1.97	1.83	1.66	1.48	1.53	1.23	1.14	1.27	1.5	1.28	1.29	1.17	1.64	1.62	1.21	1.51	1.35	1.32	2.24
Construction	5.43	5.17	6.6	5.91	5.64	5.86	5.73	5.01	4.69	4.12	4.22	4.11	4.08	4.58	6.4	6.63	6.88	6.98	7.29	5.34	3.6	4.55	5.01	4.84	5.23
Wholesale	4.51	5.89	6.41	6.72	6.02	5.3	6.25	6.65	6.09	6.85	5.52	6.68	6.7	7	7.48	7.82	7.71	6.72	8.47	7.4	5.8	6.07	5.33	5.42	4.99
Transportation	1.39	1.3	1.65	1.91	1.92	2.01	2.23	2.56	3	2.83	2.55	3.07	2.93	3.63	3.8	3.68	3.71	3.53	5	4.23	3.1	3.44	3.47	7.73	3.3
Finance	5.95	6.41	8.33	8.6	7.67	8.48	10.7	10	10.2	10.4	9.53	11.3	8.3	11.5	9.8	3.13	2.67	2.92	3.78	10.3	7.28	7.92	7.98	3.42	1.57
Other	11.5	11.8	16.8	23.6	24.6	25.8	32.8	32.5	33.6	29.2	25	26.8	27.4	27.3	27	31.2	30.5	27.4	30.4	23.5	12.8	13.1	12.8	12.6	14

Source: UN common database.

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Table 3.9: Percentage of sectors contribution to GDP, Saudi Arabia

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Agriculture	1.1	1.11	1.83	2.58	3.31	4.39	5.85	6.65	7.33	7.29	6.41	6.09	6.24	6.81	6.92	6.6	5.44	5.41	6.2	5.71	4.95	5.2	5.11	4.53	3.96
Mining	66.1	63.7	51.9	39	34.8	28.7	23.2	23.6	22.3	27.6	35.8	35.9	38.3	33.7	33.1	34.7	34.3	32.9	24.1	29.1	37.1	33.5	33.5	36.6	42.2
Manufacturing	3.98	4.73	4.73	6.31	7.8	7.8	7.28	8.66	8.58	8.12	8.13	8.1	8.51	8.51	8.77	8.95	9.81	10.1	10.6	10.4	9.66	10.1	10.3	10.7	10.1
Electricity	0.07	0.08	0.1	0.08	0.17	0.1	0.19	0.25	0.25	0.24	0.2	0.18	0.15	0.16	0.17	0.16	0.43	1.23	1.44	1.35	1.2	1.3	1.32	1.23	1.11
Construction	9.78	10.3	12.5	14	12.8	12.3	12.5	12.1	11.2	10.4	8.7	8.25	8.46	9.28	9.5	9.09	6.57	6.32	7.37	6.53	5.9	6.29	6.33	5.49	5.44
Wholesale	4.34	4.65	6.33	8.1	8.65	9.63	10.7	10.1	9.4	8.39	6.99	6.73	6.77	7.28	7.33	7.19	6.11	6.26	7.75	7.62	6.77	7.26	7.32	6.69	6.19
Transportation	3.49	3.56	4.81	6.21	6.79	7.56	8.4	8.02	8	7.44	6.31	6.1	6.16	6.66	6.77	6.46	4.24	4.23	4.9	4.62	4.12	4.45	4.52	4.13	3.8
Finance	4.41	4.61	6.58	8.64	8.68	8.66	8.28	7.8	7.86	7.42	6.16	5.66	5.63	6.03	6.13	5.74	11.6	11.5	12.8	12.2	10.8	11.5	11.6	10.7	9.71
Other	6.7	7.27	11.2	15.1	17	20.8	23.5	22.8	25.1	23.1	21.3	23	19.7	21.5	21.3	21.2	21.5	22.1	24.7	22.4	19.5	20.4	20	20	17.5

Table 3.10: Percentage of sectors contribution to GDP, UAE

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Agriculture	0.75	0.9	1.04	1.26	1.36	1.45	2.08	1.9	2.03	2.02	1.82	.	1.92	2.41	2.96	2.86	2.87	3.22	3.55	3.73	3.49	3.47	3.46	3.18	2.65
Mining	64.4	58	51.6	46	46.1	45.3	33.1	37.6	34.4	38.4	45.2	.	42.1	36.4	32	30.9	32.7	30	21.3	24.9	33.7	29.6	27.9	32	32.8
Manufacturing	3.82	7.07	8.93	9.26	9.4	9.31	9.27	9.41	9.52	8.72	7.81	.	7.89	8.49	10.2	10.4	10.2	12.2	13.5	13.1	13.4	13.8	14	13.6	12.6
Electricity	1.18	1.34	1.65	1.77	1.97	2.16	2.62	2.36	2.51	2.3	2.01	.	2.04	2.11	2.14	2.06	1.97	2.11	2.32	2.18	1.78	1.91	2.01	1.87	1.76
Construction	8.95	8.51	9.35	10.4	11.3	8.93	11.4	9.89	10.3	9.75	8.51	.	8.72	9.3	8.83	8.66	8.22	8.3	9.2	8.2	6.51	6.83	6.84	6.38	7.47
Wholesale	8.28	9.19	9.93	9.73	9.01	8.77	11.8	10.7	11.4	10.4	9.18	.	10.1	12	12.3	11.6	12	12.5	14	13	10.5	11.1	11.6	10.9	12.1
Transportation	3.4	3.46	3.74	3.71	3.79	4.25	5.58	5.38	5.79	5.71	4.93	.	5.62	6.04	6.1	6.71	6.35	6.37	7.49	7.52	6.66	7.67	8.27	8.02	7.15
Finance	5.58	7.51	8.65	11.1	10.2	10.4	13.1	11.8	11.5	11.6	10.7	.	9.05	3.21	3.4	3.62	3.53	3.75	4.34	4.34	4.13	4.56	4.42	4.19	3.91
Other	3.61	4.02	5.09	6.81	6.79	9.47	11	10.9	12.6	11.1	9.88	.	12.6	20.1	22	23.2	22.2	21.6	24.2	23.1	19.7	21.1	21.6	19.9	19.6

Source: UN common database.

Table 3.11: Estimation of simultaneous equations

	Full Sample	GCC Sample	
	(a)	**(b)**	**(c)**
(1) GDP correlation			
Trade	0.075	-0.135	-0.094
	(0.028)***	(0.1)	(0.097)
Specialization	-0.507	-0.723	-0.939
	(0.209)**	(0.352)**	(0.364)***
Finance	0.176	0.019	-0.029
	(0.074)**	(0.135)	(0.134)
Dissimilarity_trade partners			-0.135
			(0.079)*
GCC	-0.220		
	(0.144)		
Oil-Price(%)	0.092	0.196	0.222
	(0.026)***	(0.071)***	(0.075)***
oil share (country pair)	0.010	-0.832	-0.906
	(0.017)	(0.317)***	(0.323)***
(2) Trade			
Specialization	1.926	1.973	1.782
	(0.368)***	(0.430)***	(0.415)***
Finance	-2.335	0.294	-1.979
	(0.782)***	(1.4)	(1.257)
GCC	2.350		
	(0.417)***		
Distance	-0.174	0.439	0.558
	(.089)**	(0.26)*	(0.275)**
Border	-0.200	0.702	0.810
	(0.158)	(0.436)	(0.421)*
Exporter_GDP	2.190	0.713	2.302
	(0.448)***	(0.83)	(0.78)***
Importer_GDP	-0.007	0.800	0.789
	(0.027)	(0.232)***	(0.23)***
Exporter_population	-1.652	-0.814	-2.412
	(0.531)***	(1.06)	(0.98)
Importer_population	0.038	-0.879	-0.893
	(0.023)*	(0.204)***	(0.216)***
(3) Specialization			
Trade	0.030	0.244	0.195
	(0.011)***	(.057)***	(0.051)***
Finance	0.077	-0.024	0.021
	(0.03)***	(0.1)	(0.094)
Dissimilarity_trade partners	--		-0.163
			(0.047)***
GCC	-0.636		
	(.027)***		
GDPPC_gap	-0.025	-0.050	-0.070
	(0.009)***	(0.026)**	(0.026)***
GDPPC-Product	-0.013	-0.224	-0.206
	(.007)*	(0.062)***	(0.059)***
(4) Finance			
Trade	-0.146	0.069	-0.048
	(0.012)***	(0.041)*	(0.037)
GCC	0.258		
	(0.032)***		
Main_GDPPC	0.671	0.655	0.706
	(0.025)***	(0.049)***	(0.047)***
Oil/GDP	0.163	0.150	0.103
	(0.038)***	(.075)**	(0.072)
Observations	722	170	170

***, **,* represent significance at 1%, 5% & 10% level, respectively.
Standard error between parentheses

Table 3.12: Robustness- alternative measure of trade intensity

	Full Sample	GCC Sample	
	(a)	(b)	(c)
(1)GDP correlation			
Trade2	0.073	-0.150	-0.10
	(0.027)***	(0.106)	(0.101)
Specialization	-0.445	-0.848	-1.05
	(0.207)**	(0.375)**	(0.388)***
Finance	0.176	-0.007	-0.05
	(0.074)**	(0.13)	(.129)
Dissimilarity_trade partners			-0.14
			(0.08)*
GCC	-0.129		
	(0.135)		
Oil-Price(%)	0.094	0.206	0.23
	(0.026)***	(0.073)***	(0.074)***
oil share (country pair)	0.009	-0.918	-0.97
	(0.017)	(0.341)***	(0.346)***
(2) Trade2			
Specialization	2.439	2.151	1.70
	(0.388)***	(0.43)***	(0.396)***
Finance	-2.577	0.555	-2.61
	(0.826)***	(1.424)	(1.22)**
GCC	2.490		
	(0.436)***		
Distance	-0.135	0.458	0.52
	(0.089)	(0.259)	(0.262)**
Border	-0.259	0.685	0.81
	(0.1625)	(0.438)	(0.405)**
Exporter_GDP	2.291	0.516	2.58
	(0.473)***	(0.841)	(0.764)***
Importer_GDP	0.087	0.870	0.72
	(0.028)***	(0.232)***	(0.218)***
Exporter_population	-1.765	-0.514	-2.67
	(0.5618)***	(1.078)	(0.961)***
Importer_population	0.073	-0.855	-0.78
	(0.025)***	(0.201)***	(0.205)***
(3)Specialization			
Trade2	0.023	0.193	0.16
	(0.011)**	(0.053)***	(.048)***
Finance	0.073	0.024	0.06
	(0.03)**	(0.098)	(0.093)
Dissimilarity_trade partners			-0.17
			(0.047)***
GCC	-0.611		
	(0.024)***		
GDPPC_gap	-0.022	-0.047	-0.07
	(0.009)**	(0.026)*	(0.025)***
GDPPC-Product	-0.013	-0.203	-0.18
	(.0073)*	(0.06)***	(0.057)***
(4)Finance			
Trade2	-0.144	0.046	-0.08
	(0.011)***	(.040)	(0.034)**
GCC	0.152		
	(0.029)***		
Main_GDPPC	0.666	0.673	0.71
	(0.025)***	(0.046)***	(0.046)***
Oil/GDP	0.163	0.125	0.07
	(0.038)***	(0.0744)*	(0.071)
Observations	722	170	170

***, **, * represent significance at 1%, 5% & 10% level, respectively.
Standard error between parentheses.

Table 3.13: Robustness- alternative calculation business cycle synchronization.

	Full Sample	GCC Sample	
	(a)	(b)	(c)
(1)GDP correlation			
Trade	0.052	0.096	0.057
	(0.027)*	(0.105)	(0.1)
Specialization	0.028	-0.853	-0.583
	(0.209)	(0.365)**	(0.36)*
Finance	0.194	-0.136	-0.076
	(0.071)***	(0.144)	(0.138)
Dissimilarity_trade partners			0.090
			(0.08)
GCC	-0.039		
	(0.141)		
(2) Trade			
Specialization	2.032	1.887	1.735
	(0.478)***	(0.535)***	(0.498)***
Finance	-2.360	1.376	-1.570
	(0.773)***	(1.838)	(1.5)
GCC	2.342		
	(0.548)***		
(3)Specialization			
Trade	0.030	0.231	0.184
	(0.013)**	(0.068)****	(0.062)***
Finance	0.063	-0.053	0.015
	(0.036)*	(0.121)	(0.113)
GCC	-0.629		
	(0.033)***		
Dissimilarity_trade partners			-0.158
			(0.056)***
(4)Finance			
Trade	-0.144	0.113	-0.024
	(0.014)***	(0.045)***	(0.043)
GCC	0.258		
	(0.038)***		
Observations	480	111	111

***, **,* represent significance at 1%, 5% & 10% level, respectively.

Standard error between parentheses.

Coefficients of instruments are not reported.

Figure 3.1: Bahrain's real GDP growth
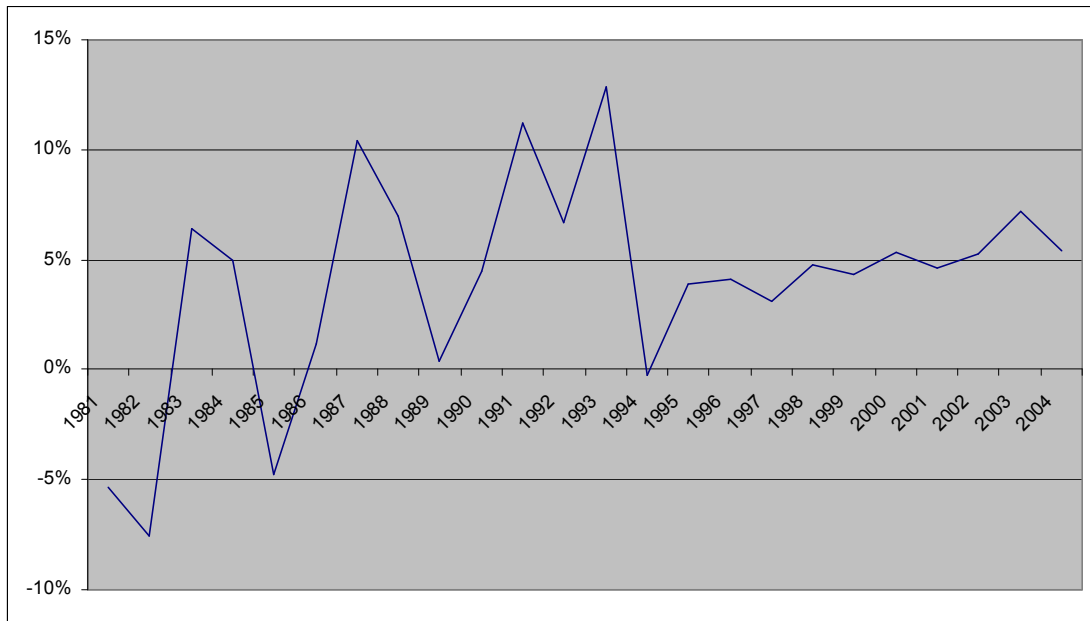
Figure 3.2: Kuwait's real GDP growth
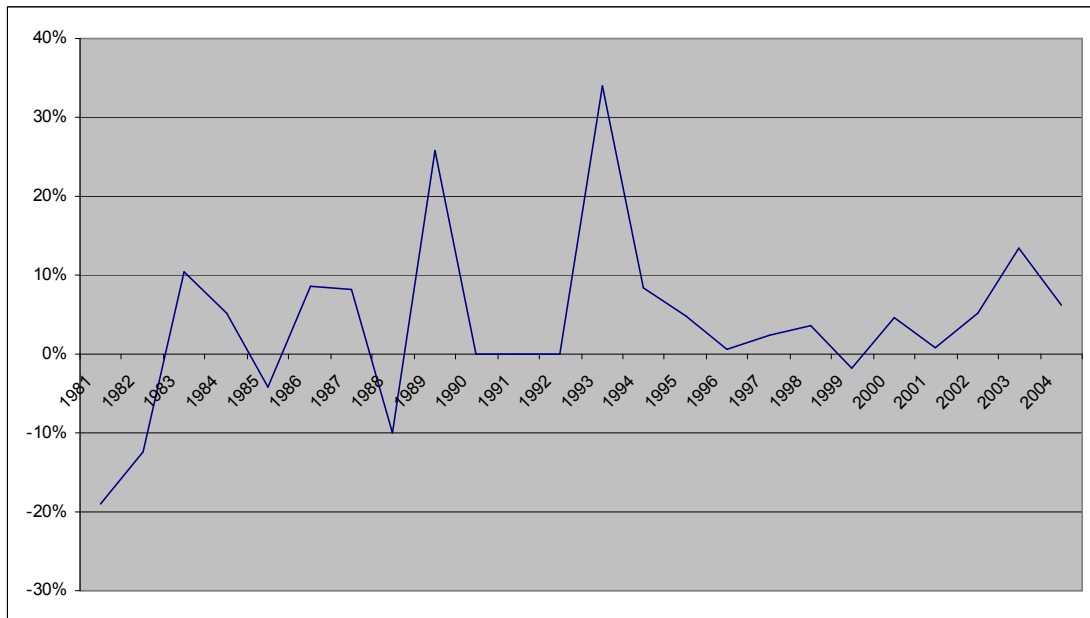
Figure 3.3: Oman's real GDP growth
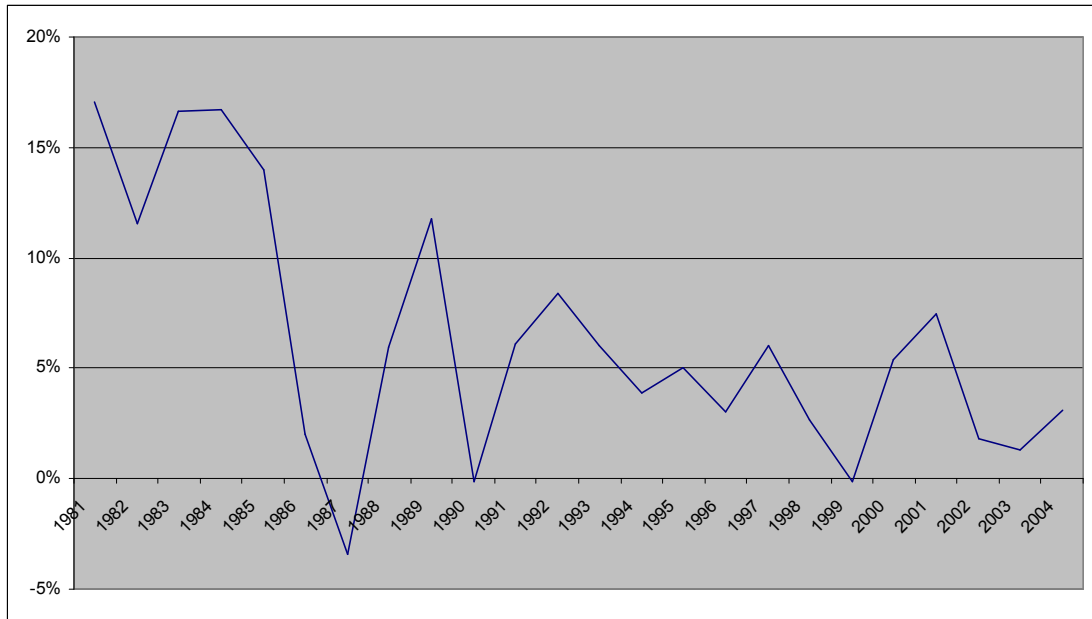
Figure 3.4: Qatar's real GDP growth
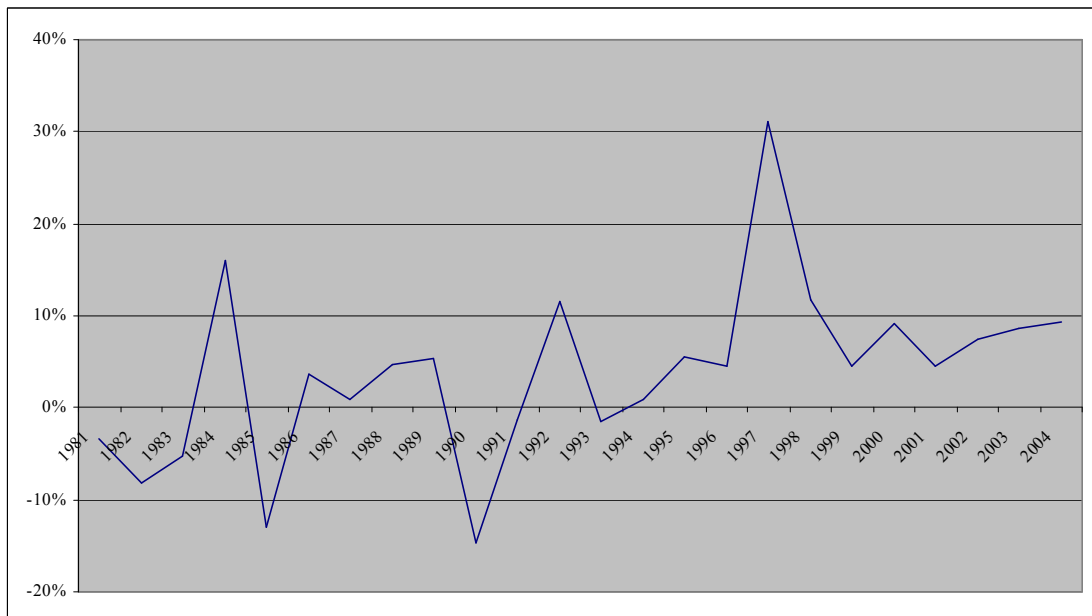
Figure 3.5: Saudi Arabia's real GDP growth
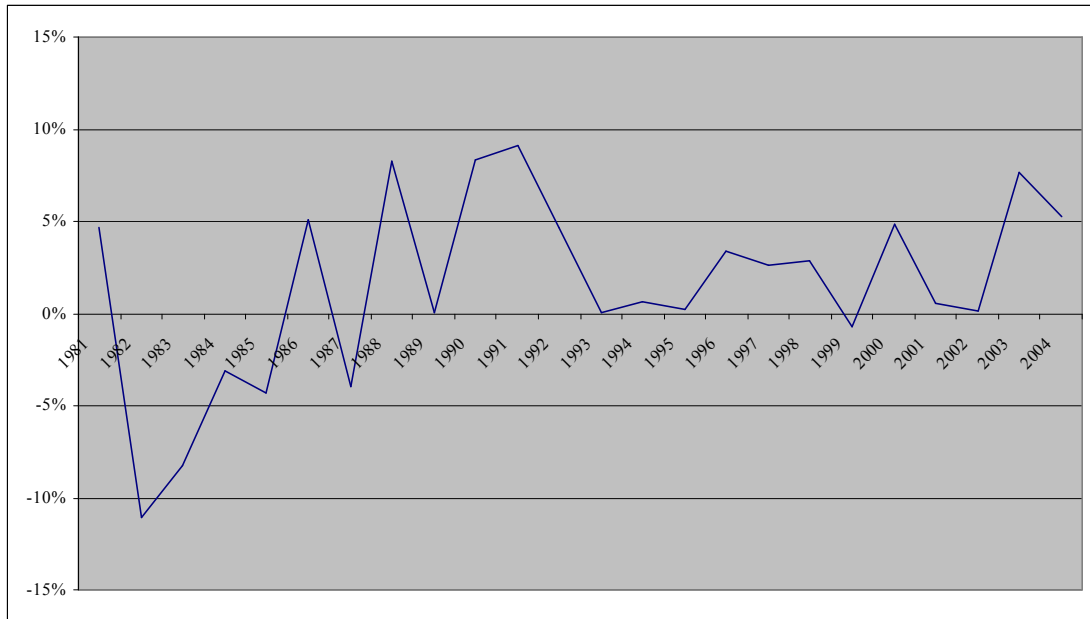
Figure 3.6: UAE's real GDP growth
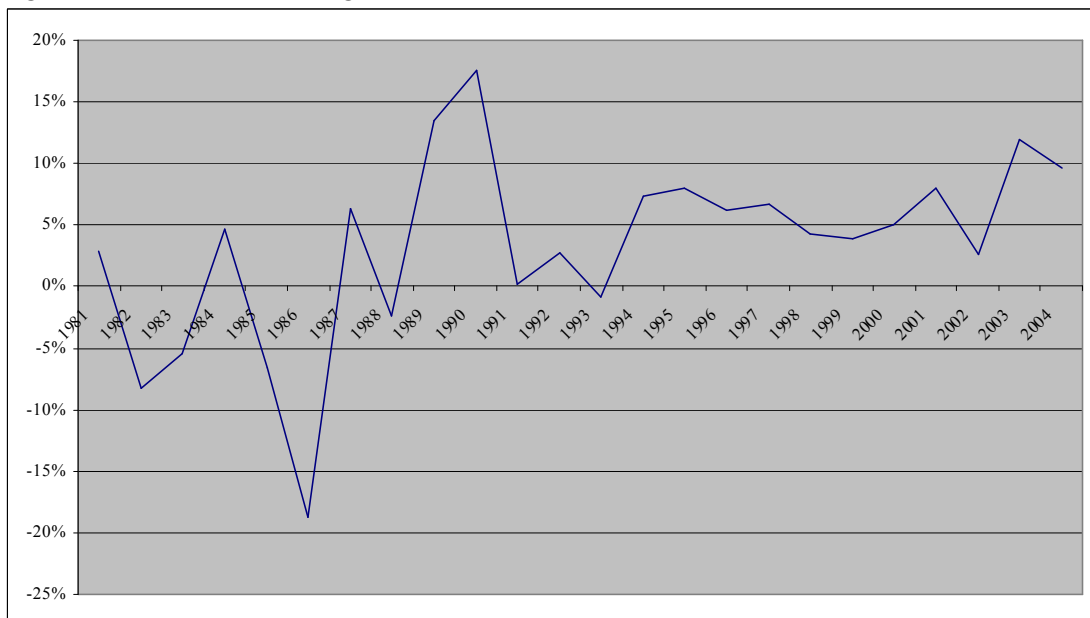
Figure 3.7: Average GDP correlation between Bahrain and GCC members
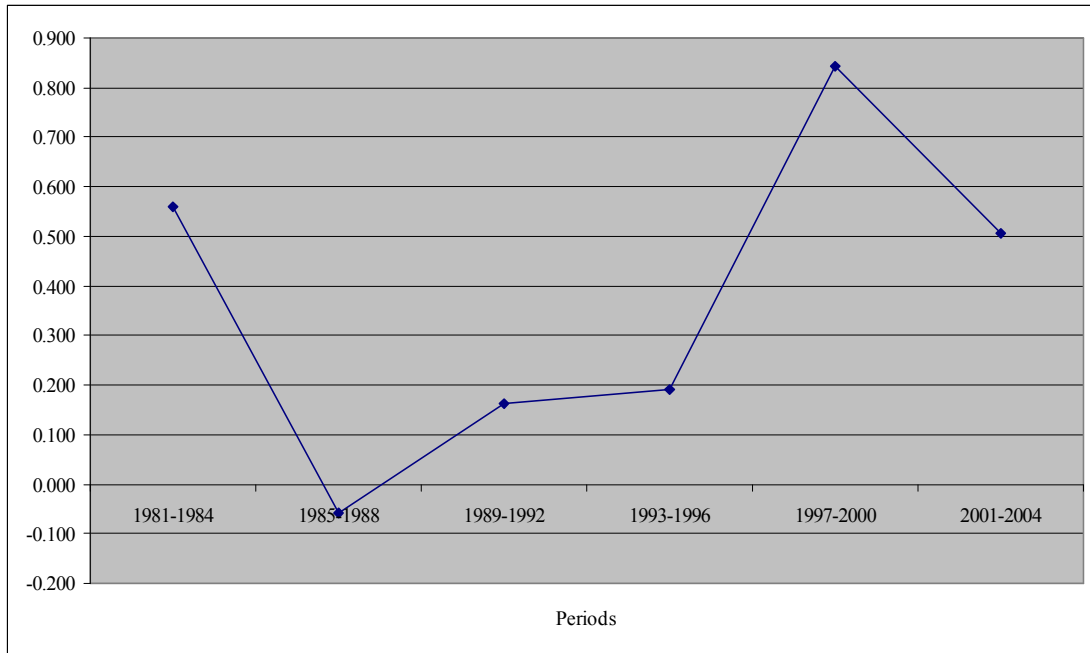
Figure 3.8: Average GDP correlation between Kuwait and GCC members
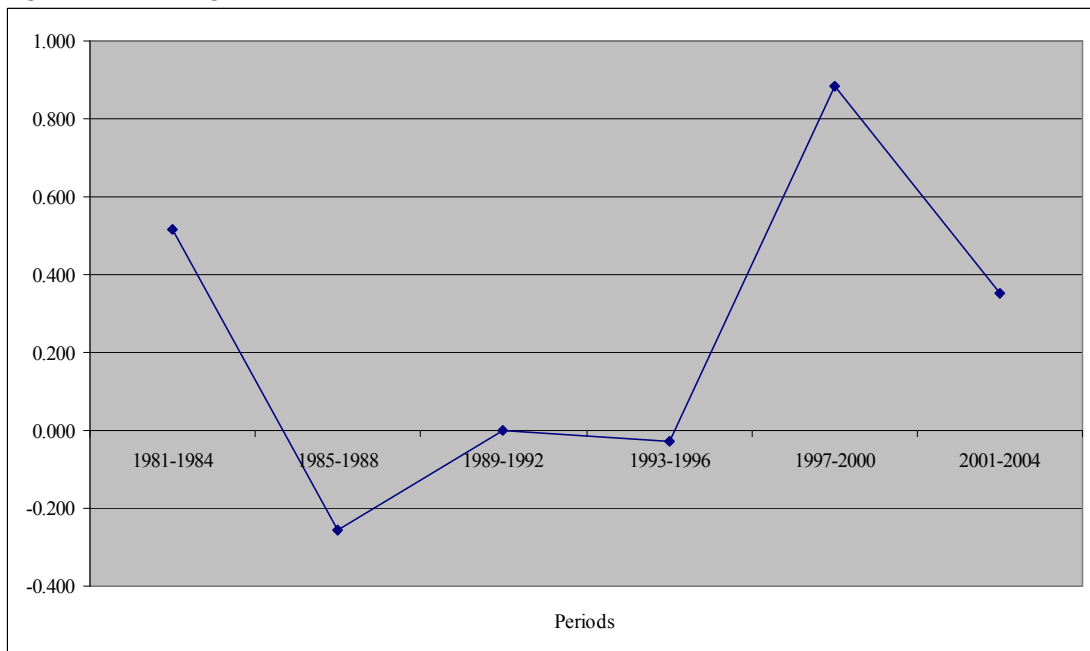
Figure 3.9: Average GDP correlation between Oman and GCC members
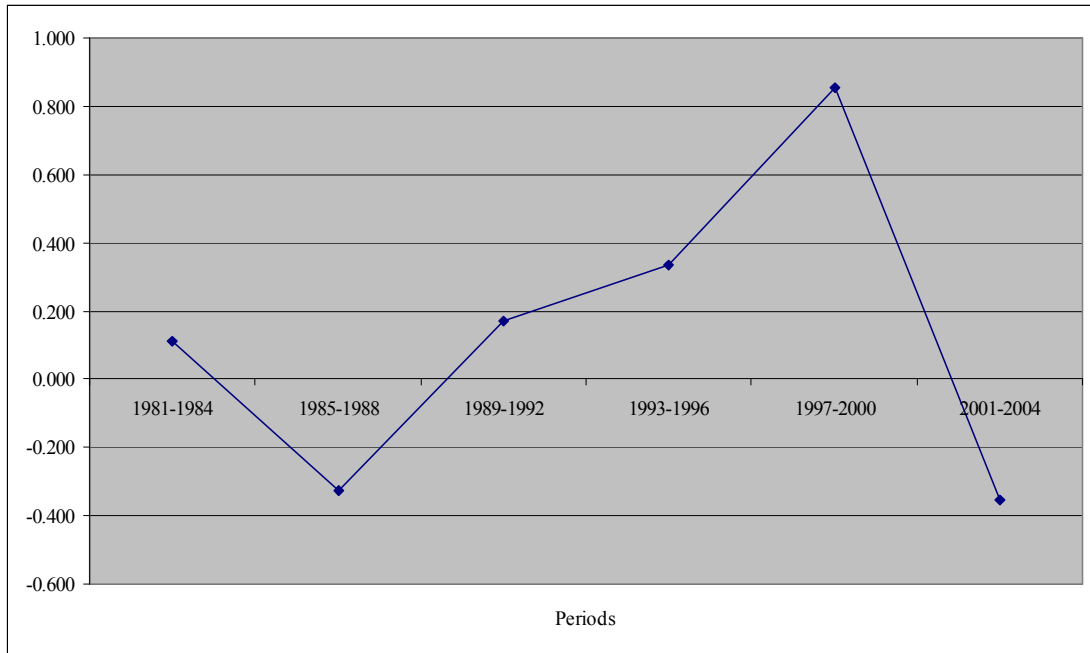
Figure 3.10: Average GDP correlation between Qatar and GCC members
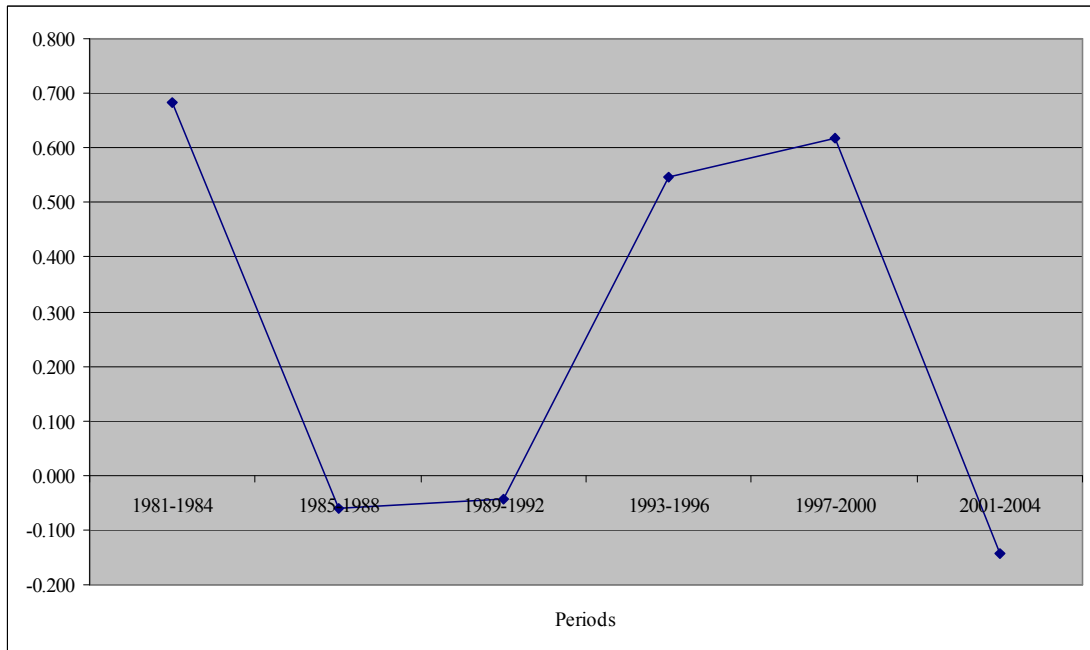
Figure 3.11: Average GDP correlation between Saudi Arabia and GCC members
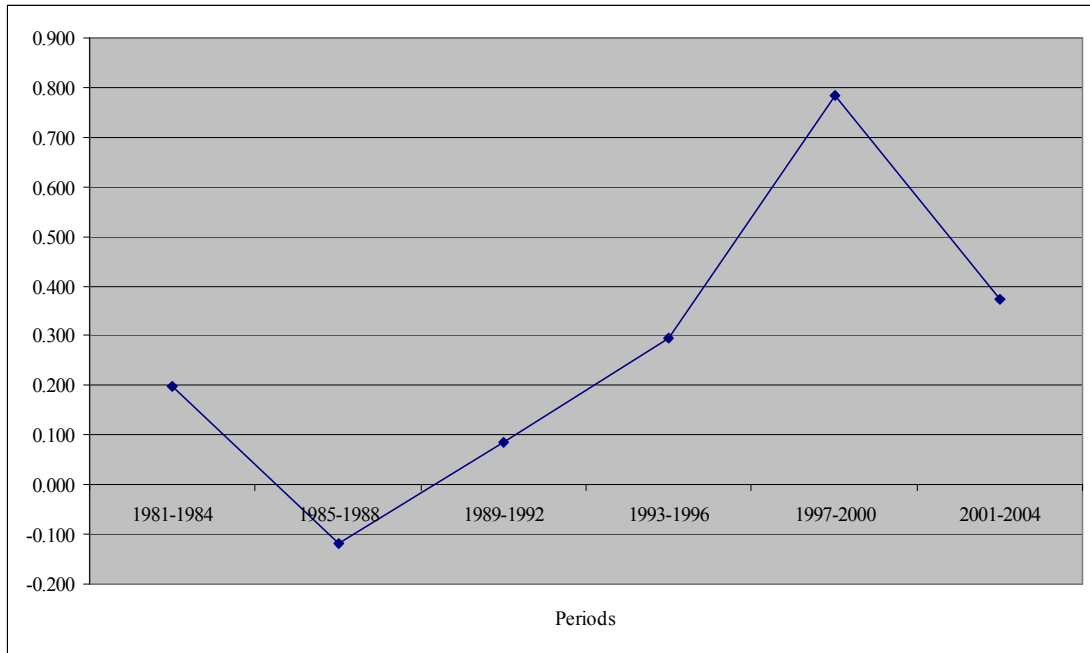
Figure 3.12: Average GDP correlation between UAE and GCC members
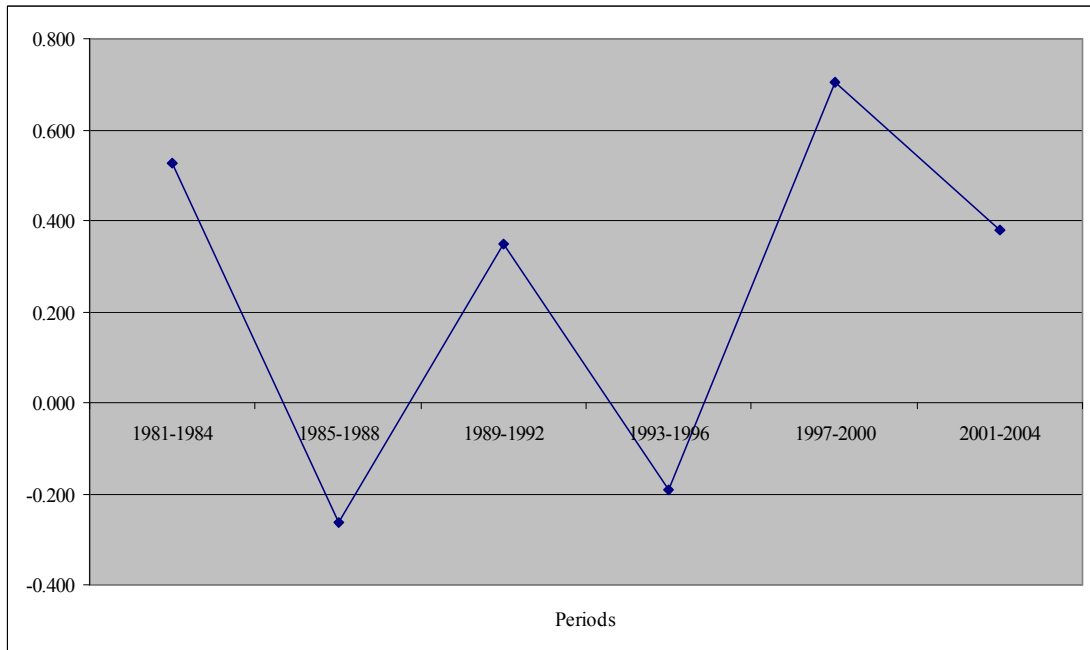
Figure 3.13: Average correlation across the GCC
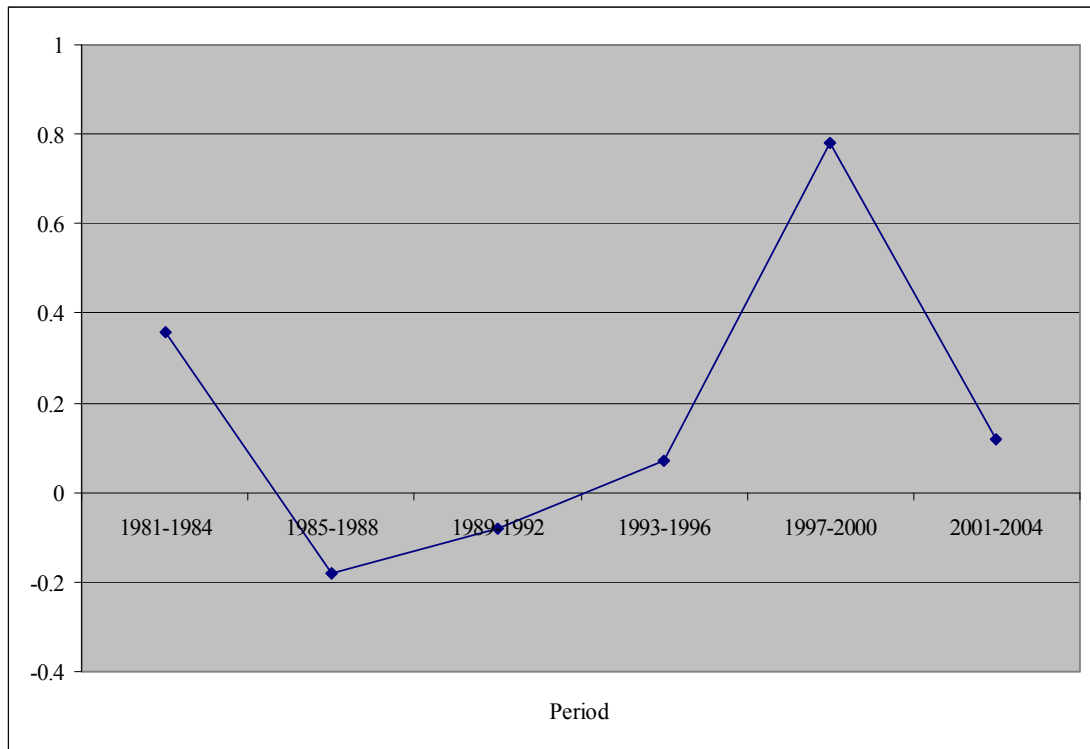
Appendix 3.A

Table 3.A.1: Government final consumption expenditure (percentage of GDP)

| Year	Bahrain	Kuwait	Oman	Qatar	Saudi Arabia	UAE
1980	13.0	11.2	25.0	19.6	15.9	10.9
1981	14.5	14.2	24.6	25.8	19.6	17.8
1982	17.0	19.3	26.1	26.1	26.2	19.4
1983	18.1	21.2	26.6	34.8	29.8	19.5
1984	20.6	20.9	26.5	36.1	30.2	17.4
1985	22.8	22.4	27.1	35.2	31.9	19.6
1986	27.2	27.0	33.2	45.6	34.7	22.1
1987	24.4	22.0	30.4	44.3	35.2	20.3
1988	24.4	26.3	29.6	45.4	30.9	21.5
1989	24.6	25.4	27.1	38.8	33.6	19.5
1990	24.2	38.7	22.3	32.9	29.2	16.3
1991	23.4	76.2	25.1	35.7	34.4	17.0
1992	23.9	55.5	24.4	33.3	29.9	17.5
1993	22.3	35.9	25.4	36.0	26.5	17.9
1994	21.0	33.9	24.9	34.5	24.4	17.3
1995	20.8	32.2	25.1	31.9	23.6	16.4
1996	20.2	27.3	23.7	33.0	24.5	15.3
1997	19.5	26.6	23.2	29.8	26.2	15.6
1998	20.8	30.5	25.9	31.6	28.4	19.8
1999	20.8	26.9	23.8	25.7	25.5	17.8
2000	17.6	21.5	20.7	19.7	26.0	15.4
2001	18.5	23.6	22.3	18.6	27.5	16.3
2002	18.5	25.3	23.0	16.7	26.1	15.3
2003	18.4	23.0	22.1	15.4	24.6	14.2
2004	16.8	19.9	21.4	13.1	23.6	12.7
2005	12.9	15.4	19.4	11.5	22.2	11.3

* Source: World Development Indicator (2008), except for Qatar which is obtained from the
International Financial indicator (2008)

Table 3.A.2

List of Participated Countries

GCC countries:	
Bahrain	Germany
Kuwait	India
Oman	Indonesia
Qatar	Italy
Saudi Arabia	Japan
United Arab Emirates	Netherland
	Korea
Non-GCC countries:	Spain
Australia	Sweden
Canada	Switzerland
China	Thailand
Hong Kong	United Kingdom
France	USA

Table 3.A.3: GCC's top four trading partners*

Country	Major trading partners
Bahrain	Saudi Arabia, USA, Korea, Japan
Kuwait	Japan, Korea, USA, Singapore
Oman	China, Korea, Japan, Thailand
Qatar	Japan, Korea, Singapore, Spain
UAE	Japan, Korea, Iran, Thailand

*According to export volumes from GCC countries based on 2004 data from the UN commtrade

Appendix 3.B

Constructing a measure of financial openness

The bilateral financial openness index for the period 1980-2004 will be estimated based on capital account restrictions information published in the IMF's *Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER)*. Starting from the 1996 edition, the IMF divides capital account transactions into 13 subcategories, resulting in much more suitable capital control measures. These 13 subcategories are as follows:

- Capital market securities: shares or other securities of a participating nature, and bonds and other securities with an original maturity of more than one year.
- Money market instruments: securities with an original maturity of one year or less, such as certificates of deposit, Treasury bills, and so forth.
- Collective investment securities: share certificates or any evidence of investor interest in an institution for collective investment, such as mutual funds.
- Derivatives and other instruments: refers to operations in other negotiable instruments and non-securitized claims not covered under the previous three items.
- Commercial credits: covers operations directly linked to international trade transactions.
- Financial credits: credits other than commercial credits.
- Guarantees, sureties, and financial backup facilities: securities pledged for payment of a contract, such as warrants, letters of credit, and so on.
- Direct investment.
- Repatriation of profits or liquidation of direct investment.
- Real estate transactions.
- Personal capital movements: not considered in this paper because of a lack of consistent information in past editions of the *AREAER*.
- Provisions specific to commercial banks and other credit institutions: regulations that are specific to these institutions, such as monetary and prudential controls.
- Provisions specific to institutional investors: one common example is a limit on the share of the institution's portfolio that may be held in foreign assets.

Each category will be represented by a dummy where its value takes 1 if a restriction is present; 0 otherwise. In this essay, an additional category is added which represents the presence of a special capital account access granted to GCC members only, where its value takes the value of 1 if no special access is given to GCC members; 0 otherwise.

AREAER's reports from 1980-1995 include text information only. To construct dummies in each category for editions prior to 1996, the methodology suggested by

Miniane (2004) is followed, where text information is used to complete as many of the 14 subcategories as possible.[81]

Table 3.B.1 shows the number of restrictions on capital account transactions, out of 14 subcategories, for both GCC members and non-members. To represent these categories as an index, the number of restrictions is divided by 14. A maximum value of one would indicate capital account restrictions on all the 14 subcategories, while a minimum value of zero indicates no restrictions are imposed. The index is presented in Table 3.B.2 below. For the purpose of this essay, this index is revised to represent an index of financial openness by subtracting it from one. Therefore, a maximum value of 1 would represent highest openness, while a value of zero would represent no openness.

Finally, this index should be viewed with caution due to some limitations as suggested by Miniane (2004). First, the measure doesn't discriminate between controls on inflows and outflows. Second, the *AREAER* reports do miss some important liberalization. Regarding the GCC countries, there have been frequent missing data for subcategories, especially for early years.

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[81] For more details, see Miniane (2004), page 282.

Table 3.B.1. Restrictions on Capital account transactions*

	Bahrain	Kuwait	Oman	Qatar	Saudi Arabia	UAE
1980	11 (11)	11 (11)	11 (11)	3 (3)	8 (8)	2 (2)
1981	11 (11)	11 (11)	11 (11)	3 (3)	8 (8)	4 (4)
1982	11 (11)	11 (11)	11 (11)	3 (3)	8 (8)	4 (4)
1983	11 (11)	10 (11)	11 (11)	3 (3)	10 (10)	4 (4)
1984	11 (11)	10 (11)	11 (11)	2 (3)	10 (10)	5 (5)
1985	11 (11)	10 (11)	11 (11)	2 (3)	10 (10)	7 (7)
1986	11 (11)	10 (11)	11 (11)	2 (3)	10 (10)	7 (7)
1987	11 (11)	10 (11)	11 (11)	2 (3)	10 (10)	7 (7)
1988	11 (11)	10 (11)	11 (11)	2 (3)	10 (10)	7 (7)
1989	11 (11)	10 (11)	11 (11)	2 (3)	10 (10)	6 (7)
1990	11 (11)	10 (11)	11 (11)	2 (3)	10 (10)	5 (6)
1991	11 (11)	10 (11)	11 (11)	2 (3)	10 (10)	5 (6)
1992	11 (11)	10 (11)	11 (11)	2 (3)	10 (10)	5 (6)
1993	11 (11)	10 (11)	11 (11)	1 (2)	10 (10)	5 (6)
1994	11 (11)	10 (11)	11 (11)	1 (2)	10 (10)	5 (6)
1995	11 (11)	10 (11)	11 (11)	2 (3)	10 (10)	5 (6)
1996	4 (5)	7 (8)	5 (5)	2 (3)	10 (10)	5 (6)
1997	4 (5)	7 (8)	5 (5)	2 (3)	9 (10)	5 (6)
1998	3 (4)	7 (8)	5 (5)	3 (4)	10 (11)	5 (6)
1999	3 (4)	7 (8)	5 (5)	3 (4)	10 (11)	5 (6)
2000	4 (5)	7 (8)	5 (5)	3 (4)	10 (11)	5 (6)
2001	4 (5)	7 (8)	5 (5)	3 (4)	10 (11)	5 (6)
2002	4 (5)	7 (8)	5 (5)	3 (4)	10 (11)	5 (6)
2003	4 (5)	7 (8)	4 (5)	3 (4)	10 (11)	5 (6)
2004	6 (7)	7 (8)	4 (5)	3 (4)	10 (11)	5 (6)

* Each entry represents the number of restrictions imposed in each year toward GCC members, where numbers in parentheses represent restrictions toward non-GCC members.

Table 3.B.2 Index of Capital Account restrictions

	Bahrain	Kuwait	Oman	Qatar	Saudi Arabia	UAE
1980	0.786 (0.786)	0.786 (0.786)	0.786 (0.786)	0.214 (0.214)	0.571 (.571)	0.143 (0.143)
1981	0.786 (0.786)	0.786 (0.786)	0.786 (0.786)	0.214 (0.214)	0.571 (.571)	0.286 (0.286)
1982	0.786 (0.786)	0.786 (0.786)	0.786 (0.786)	0.214 (0.214)	0.571 (.571)	0.286 (0.286)
1983	0.786 (0.786)	0.714 (0.786)	0.786 (0.786)	0.214 (0.214)	0.714 (0.714)	0.286 (0.286)
1984	0.786 (0.786)	0.714 (0.786)	0.786 (0.786)	0.143 (0.214)	0.714 (0.714)	0.357 (0.357)
1985	0.786 (0.786)	0.714 (0.786)	0.786 (0.786)	0.143 (0.214)	0.714 (0.714)	0.5 (0.5)
1986	0.786 (0.786)	0.714 (0.786)	0.786 (0.786)	0.143 (0.214)	0.714 (0.714)	0.5 (0.5)
1987	0.786 (0.786)	0.714 (0.786)	0.786 (0.786)	0.143 (0.214)	0.714 (0.714)	0.5 (0.5)
1988	0.786 (0.786)	0.714 (0.786)	0.786 (0.786)	0.143 (0.214)	0.714 (0.714)	0.5 (0.5)
1989	0.786 (0.786)	0.714 (0.786)	0.786 (0.786)	0.143 (0.214)	0.714 (0.714)	0.429 (0.5)
1990	0.786 (0.786)	0.714 (0.786)	0.786 (0.786)	0.143 (0.214)	0.714 (0.714)	0.357 (0.429)
1991	0.786 (0.786)	0.714 (0.786)	0.786 (0.786)	0.143 (0.214)	0.714 (0.714)	0.357 (0.429)
1992	0.786 (0.786)	0.714 (0.786)	0.786 (0.786)	0.143 (0.214)	0.714 (0.714)	0.357 (0.429)
1993	0.786 (0.786)	0.714 (0.786)	0.786 (0.786)	0.071 (0.143)	0.714 (0.714)	0.357 (0.429)
1994	0.786 (0.786)	0.714 (0.786)	0.786 (0.786)	0.071 (0.143)	0.714 (0.714)	0.357 (0.429)
1995	0.786 (0.786)	0.714 (0.786)	0.786 (0.786)	0.143 (0.214)	0.714 (0.714)	0.357 (0.429)
1996	0.286 (0.286)	0.500 (0.571)	0.357 (0.357)	0.143 (0.214)	0.714 (0.714)	0.357 (0.429)
1997	0.286 (0.286)	0.500 (0.571)	0.357 (0.357)	0.143 (0.214)	0.643 (0.714)	0.357 (0.429)
1998	0.214 (0.286)	0.500 (0.571)	0.357 (0.357)	0.214 (0.286)	0.714 (0.786)	0.357 (0.429)
1999	0.214 (0.286)	0.500 (0.571)	0.357 (0.357)	0.214 (0.286)	0.714 (0.786)	0.357 (0.429)
2000	0.286 (.357)	0.500 (0.571)	0.357 (0.357)	0.214 (0.286)	0.714 (0.786)	0.357 (0.429)
2001	0.286 (.357)	0.500 (0.571)	0.357 (0.357)	0.214 (0.286)	0.714 (0.786)	0.357 (0.429)
2002	0.286 (0.357)	0.500 (0.571)	0.357 (0.357)	0.214 (0.286)	0.714 (0.786)	0.357 (0.429)
2003	0.286 (0.357)	0.500 (0.571)	0.286 (0.357)	0.214 (0.286)	0.714 (0.786)	0.357 (0.429)
2004	0.428 (0.5)	0.500 (0.571)	0.286 (0.357)	0.214 (0.286)	0.714 (0.786)	0.357 (0.429)

* Each entry represents the index in each year toward GCC members, where ratio in parentheses represents Index toward non-GCC members.

4   Income and Consumption smoothing by the GCC countries

4.1   Introduction

The GCC countries tend to have a volatile output growth owing to their pattern of specialization and the high share of natural resources in their economies. Although industrial specialization allows countries to better exploit their comparative advantages, specialized countries are faced with the risk of losing welfare in the absence of insurance against production risk. The GCC's proposed monetary union with a common currency by 2010 raises many questions about the costs associated with it, which mainly include losing the ability to run an independent monetary policy. Such cost is low if members face common shocks and their economic activities are synchronized. If shocks and economic disturbance are asymmetric, then giving up an independent monetary policy may result in higher membership costs than benefits. Sørensen and Yosha (1998) argue that the absence of income insurance will increase the likelihood of a country abandoning the currency union during a recession, where the impact of asymmetric shocks can be reduced through income and consumption smoothing.

The term income smoothing refers to the situation in which a country's income from foreign investments is insulated from its domestic output. In other words, the stream of income from abroad would work as an insurance against negative shocks to domestic output. A smoother income, on the other hand, would translate into a smoother consumption, making it less dependent on domestic output. Income and consumption smoothing can be achieved through three major channels involving central fiscal institutions and market institutions.[82] First, fiscal institutions can smooth output fluctuations through a fiscal transfer system to individual countries. For instance, governments can lower taxes and increase transfers to affected countries. Market institutions, which include capital and credit markets, are additional channels that would enable countries to smooth their income and consumption through investment portfolio diversification. Capital markets would enable countries to share their output risk through cross-country ownership of productive assets, which

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[82] See Asdrubali *et al.* (1996) and von Hagen (2000) for details.

would smooth away idiosyncratic shock to their income. Credit markets provide opportunities to smooth consumption through lending and borrowing, where savings are adjusted in response to output shocks.

Brought by development of globalization in world economy, financial markets across countries have witnessed a high integration. Since the 1990s, the GCC countries have witnessed a noticeable increase in their foreign assets and liabilities.[83] The overall holdings vary across the GCC countries, with a rising trend toward diversification. However, many of these holdings are still too small to expect an effective role in smoothing output fluctuations. For instance, equity assets and FDI are very small relative to GDP in most of the GCC countries, where debt components strongly dominate the group's portfolio. In addition, the majority of the GCC countries tend to show high preference for investing in domestic equities which tend to be highly correlated with domestic outputs.

It is expected that the GCC countries would have a better potential to obtain greater income and consumption smoothing from cross-holding of diversified assets and liabilities than more diversified economies. Demyanyk and Volosovych (2008) argue that countries with a higher output volatility would gain more from diversifying their country-specific risk. It may be understood that the degree of income and consumption smoothing by the GCC countries will be a vital criterion of stability and effectiveness of regional integration, therefore, should be a greater priority. Given that, the analysis in this essay will be based on two interrelated empirical parts. The first aims to shed light on the channels through which income and consumption smoothing take place. More specifically, smoothing via capital and credit markets will be tested. The approach will be based on decomposing cross-sectional variance in income within the GCC countries as originally suggested by Asdrubali *et al.* (1996). The second part will complement the first by focusing on the role of investment portfolio diversification on smoothing income and consumption. The aim will be to assess whether holdings of foreign assets and liabilities are conducive to attaining higher income and consumption smoothing. Given the GCC's output volatility and the

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[83]Assets refer to ownership of foreign investment held by domestic investors. Equity assets refer to ownership of shares of companies and mutual funds that are below 10 percent, while debt assets refer to debt securities. Liabilities refer to ownership by foreigners of domestic investments. Tables 4.1 and 4.2 display ratios of foreign equity, debt and FDI during the years 1980, 1990, 2000, and 2004, where Figures 4.1-4.30 show the pattern of their growth and size relative to GDP.

potential for smoothing their output fluctuations, understanding their income and consumption smoothing pattern is an important empirical task. To my knowledge, this is the first empirical assessment of income and consumption smoothing by the GCC countries in addition to the role of investment portfolio diversification on smoothing income and consumption.[84]

This essay finds that more than 60 percent of shocks to GDP remain unsmoothed, where the bulk of smoothing is achieved via the national saving channel. Furthermore, two major findings emerge from the analysis of the role of investment portfolio. First, assets components seem to have no role in insulating income and consumption from output fluctuation. Liabilities, on the other hand, show a tendency to reduce income and consumption smoothing. Though lower than that achieved within the U.S., the level of smoothing via net factor income by the GCC countries is found to be higher than smoothing achieved by many regional entities such as the EU, EMU and East Asia.

The remainder of the paper is organized as follows. The next section presents the major literature on risk sharing. Section 4.3 is an overview of the international portfolio holdings by the GCC countries. Section 4.4 contains a discussion about the empirical analysis and results. Section 5.4 concludes.

4.2 A review of the literature

The term 'full risk sharing' refers to a situation in which consumption grows at identical rates in all countries. Theoretically, local consumption would be highly correlated with local output in case of a closed economy that has no trade in financial assets. On other hand, an open economy with complete market would allow for low association between local consumption and local output, where consumption became more correlated across countries.[85] However, the data and many empirical studies show that cross-country consumption correlations are lower than output correlation; therefore assuming a low degree of risk sharing.

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[84] It should be noted that this essay evaluates the overall average income and consumption smoothing ability of the GCC countries as a group, rather than evaluating income and consumption smoothing in a bilateral fashion among the GCC countries.
[85] See Backus *et al.* (1995) for details.

Empirically, many do not support the theoretical prediction of full risk sharing; rather, they find that domestic consumption is more correlated with domestic output than global output. Among those documenting the pattern of consumption and output is Pakko (1998), who finds weak support for high correlation between consumption and world output.[86] Kose *et al.* (2003b) examined the impact of world- and country-specific factors on output and consumption fluctuation. They concluded that country-specific shocks are the main factors for explaining the behaviour of consumption fluctuations.

Obstfeld (1994a,1995) was among the first to test for full risk sharing on a country level. He regressed country-level consumption growth on world consumption and own-country income growth among a number of developed and developing countries over the period 1950-88, and found little support for full risk sharing before 1973. In a later major contribution, Asdrubali *et al.* (1996) propose the variance decomposition of shocks to output in order to break cross-sectional consumption smoothing into several levels. Looking at the U.S., which represents a successful monetary union, they found that 39 and 23 percent of shocks to output are smoothed through capital market and credit market respectively.

The approach of Asdrubali *et al.* (1996) has been widely followed in empirical research on international risk sharing. For instance, Sørensen and Yosha (1998) looked at some OECD countries for the period from 1966-1990, and found that the impact of international capital market on smoothing output shocks is small, where 60-70 percent of the idiosyncratic output shocks remain unsmoothed. Mélitz and Zumer (1999) extend and modify the model, and find similar results regarding high risk sharing among the U.S. states, while low among OECD countries. They argued that about 75-80 percent of idiosyncratic shocks among EU countries are not smoothed, and that fostering market-based mechanisms could improve risk sharing.

Others have argued that an absence of efficient financial markets that facilitate cross-ownership of foreign assets is a potential cause of low risk sharing. For instance, Acemoglu and Zilibotti (1997) present a model linking the degree of market incompleteness to capital accumulation and growth. They argue that, as a

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[86] Using data for 73 countries including OECD.

consequence of the absence or inefficiencies in the financial market that allow for portfolio diversification, countries will specialize in production with low risk. If an efficient financial system is present, a country can invest in a higher return investment that would increase income growth. Similarly, Kalemli-Ozcan *et al*. (2004), who also follow Asdrubali *et al.* (1996), argue that risk sharing among EU countries has been increasing over the period 1990-2000 as a result of a rise in the cross-country ownership of assets. [87] In a recent contribution, Kim *et al.* (2006) examined the degree of risk sharing among various groups of East Asian countries, and found that risk sharing is very low compared with that of the U.S. and European and OECD countries[88], with limited impact from capital and credit markets. They suggest that the low risk sharing is the result of financial market constraint, lower levels of trade integration, low labour mobility, and less developed financial markets.

In a more recent contribution, Becker and Hoffmann (2006) focus on the dynamic aspects of risk sharing which account for transitory and permanent components of shocks. [89] Their results suggest that transitory shocks can be completely smoothed through credit markets, while permanent shocks, however, are not smoothed. In the case of the U.S., about 50 percent of their permanent idiosyncratic risk is smoothed through cross-state capital income flows, while OECD countries do not share any of their permanent idiosyncratic risk.[90]

As opposed to much of the above literature, many have argued about a low risk sharing among the U.S. For instance, Atkeson and Bayoumi (1993) found limited risk sharing through capital markets among the U.S., even though capital mobility is high. Hess and Shin (1998), who based their study on the cross-state correlation of consumption and output among 19 states, showed that consumption is less correlated than output, which indicates a lack of risk sharing. In a similar conclusion, Del Negro (2002) applied a factor model on four of the U.S. datasets and argued that the findings of Asdrubali *et al*. (1996) on high risk sharing might be the result of measurement error in output. Moser *et al*. (2004) analysed risk sharing among 15 EU countries over the period 1960-2002 and found no indication of an increase in risk sharing.

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[87] More specifically, this channel smoothes about 10 percent of idiosyncratic output shocks.
[88] They find that about 20 percent of cross-sectional GDP variance is smoothed.
[89] Their approach is based on Asdrubali *et al. (*1996) methodology of variance decomposition.
[90] Their method is based on panel VAR, and their data cover U.S regional data and OECD countries over the period 1960-1996.

Different theoretical contributions have attempted to explain the differences between theory and data. Stockman and Tesar (1995) introduced preference shocks into a two-country model with tradable and non-tradable goods and found a low consumption correlation that is supported by the data. Others, e.g. Baxter (1995), and Heathcote and Perri (2002), introduced models with incomplete assets markets that reduce the incentive for risk sharing, which result in the production of much more consistent results. In addition, theoretical models that incorporate transaction costs and trade barriers, e.g. those of Obstfeld and Rogoff (2006), find support for low correlation between consumption and output. Lewis (1996) argues that the joint impact of non-separability between tradable and non-tradable goods and the effect of capital market restrictions on consumption risk sharing are necessary to explain consumption risk sharing across countries.

Some of the differences in the literature can be related to two issues. First, many studies are based on ad hoc assumptions. Second, there is no agreed measure of financial openness and integration. In a recent study, Islamaj (2008) argued that it is important to account for both initial financial integration and the correlation between productivity processes of a country and the rest of the world. According to him, ignoring these joint effects in past studies can explain why there has been low association between financial openness and consumption risk sharing.

4.3   An overview of the international portfolio holdings in the GCC

One of the main channels of income and consumption smoothing is via the holding of foreign assets and liabilities. A diversified holding has the potential to hedge against idiosyncratic output fluctuation and to lower co-movement of income and consumption with domestic output. Since the 1990s, the GCC countries have witnessed a noticeable increase in foreign assets and liabilities. The overall holdings vary across the GCC countries with a rising trend toward diversification. Supported by the rising oil prices, the GCC's Sovereign Wealth Funds have been playing an important role in foreign investment, with the aim of diversifying sources of income away from oil. [91]

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[91] Investment by the GCC's Sovereign Wealth Funds up to 2004 are corroborated in this essay.

Sørensen and Yosha (1998) suggested that a developed and integrated capital market that facilitates cross-ownership of productive assets and access to credit markets is important for improving income and consumption smoothing. In an empirical analysis of OECD countries, Sørensen *et al.* (2007) show that a high level of foreign assets is positively related to income and consumption smoothing. Similarly, Kose *et al.* (2007) suggest that only industrial countries are experiencing income and consumption smoothing, while it is limited for developing and emerging countries. They found that, in general, FDI and portfolio equity stocks improve smoothing, but not through debt stocks. One possible explanation is that most of the capital flow, mostly composed of debt, to emerging markets tends to be pro-cyclical, which tends to increase in good times and fall during bad times.

The following three sections present an overview on GCC's international portfolio holdings and shed light on the degree of assets diversification. Apart from the UAE, the GCC's foreign assets are highly biased toward debt securities. Being exposed to a single type of asset is expected to limit potential gains from assets diversification. As discussed earlier, debt assets are not expected to smooth permanent shocks to output.

4.3.1   Portfolio investment in the GCC

We can attempt to understand the role of portfolio investment in the GCC by looking at the level of foreign assets and liabilities holding relative to GDP.[92] Tables 4.1 and 4.2 display ratios and trends of foreign equity, debt and FDI during the years 1980, 1990, 2000, and 2004, where Figures 4.1-4.30 show the pattern of their growth and size relative to GDP. Assets refer to ownership of foreign investment held by domestic investors. Equity assets refer to ownership of shares of companies and mutual funds that are below 10 percent, while debt assets refer to debt securities. Liabilities refer to ownership by foreigners of domestic investments. Though there seems to be a rising trend toward diversification, many of these holdings are still too small relative to GDP to expect an effective role in smoothing output fluctuations.

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[92] Data are from Lane and Lilesi-Ferretti (2006).

Among assets, debt is the major component for all countries; Bahrain holds the highest ratio, which far exceeds its GDP, and Oman holds the lowest share. It is also noticeable that the share of debt had more than doubled by the year 1990, except for Oman, Bahrain and Saudi Arabia, where it grew by 26, 55 and 86 percent respectively. By the end of 2004, all countries had experienced a fall in the share of debt, ranging from 29 to 65 percent for Saudi Arabia and Qatar respectively.

FDI, on the other hand, does play an important role, especially in Bahrain where the share of FDI grew significantly in 2000 and 2004. In a 25-year-period, the share of FDI has increased by 95 percent. Next comes Kuwait with a much lower share: it has experienced a large drop of 66 percent since its peak in 1990.[93] Saudi Arabia and the UAE come next with an average FDI share of 1.67 and 1.17 percent during the period 1990-2004, respectively. Although a rising trend is seen in Oman and Qatar, the share of FDI is very limited. The data show that equity assets are absent in Kuwait, Oman and Qatar, while low in Saudi Arabia. The UAE, on the other hand, held by far the highest ratio with an average share of 100 percent during the full period, while Bahrain held an average share of 40 percent.

On the liability side, the share of FDI relative to GDP has increased remarkably in most of the members' portfolios during the 1990s and up to 2004. Debt, which is the major component on the liability side, experienced an average decline of 34 percent for all countries after 1990, with the exception of Qatar, which shows an increase by an average of 61 percent. Equity is a limited component and shows its presence during the late 1990s only, implying higher financial openness in recent years. A remarkable growth in the share of equity was in Bahrain, which witnessed an approximate nineteen-fold increase during the period 2000-2004. Within the same period, Oman had a more than twofold increase. By 2004, the share of equity was 6.07 and 3.18 percent in Bahrain and Oman respectively, while it was below 1 percent for the rest of the countries.

Although there was a noticeable increase in FDI and equity during the 1990s, their share relative to GDP is still small and may not be expected to provide significant income and consumption smoothing, as suggested by Baxter and Jermann

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[93] Kuwait invasion was in 1990-1991.

(1997). On the debt side, assets and liabilities have fallen, but they are still by far the major component in the portfolio holdings. Given such a high contribution from debt investments, it is not expected that it would provide significant smoothing as would be expected from equity or FDI assets, owing to the output volatility in the GCC. Asdrubali *et al.* (1996) and Becker and Hoffmann (2006) argue that transitory shocks can be completely smoothed through the credit market, but permanent shocks cannot. Similarly, Kose *et al.* (2007) find that, in general, smoothing output shocks is not improved through debt stocks.[94] As mentioned earlier, most of the capital flow, mostly composed of debt, to emerging markets tends to be pro-cyclical, which tends to increase in good times and fall during bad times.

4.3.2   GCC International Investment positions

A different angle for looking at the GCC portfolios is to inspect their net International Investment Position (IIP), which is calculated as domestically-owned foreign assets minus foreign-owned domestic assets. Net IIP can be viewed as a balance sheet of the stock of external financial assets and liabilities, where a country would be a creditor when the net IIP is positive and a debtor otherwise. Figures 4.31-4.36 show the total net IIP in addition to net IIP for equity, FDI, and debt securities for the GCC members during the period 1980-2004.

Apart from Oman, the GCC countries enjoy a positive net IIP position for the whole period, with a rising trend in recent years. On average, the UAE holds the highest net IIP followed by Saudi Arabia, Kuwait, Qatar, Bahrain and finally Oman with a negative net IIP for most of the period. The dominance of debt securities is clearly present among Kuwait, Qatar, and Saudi Arabia, where debt securities are the only positive component among Qatar and Saudi Arabia. By the end of 2004, Kuwait, Qatar and Saudi Arabia have accumulated a positive net IIP of 114.36, 63.14, and 157.05 billion US$, respectively. On the other hand, net IIP from equity plays a major role in Bahrain and UAE, where its share dominates in recent years. By the end of 2004, Bahrain and UAE have accumulated a positive net IIP of about 7.5 and 127.7 billion US$, respectively. Oman, which shows a very different pattern, has been a debtor for most of the sample. It is interesting to observe that the downward trend of

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[94] The analysis is performed with industrial, developing and emerging countries.

Oman's total net IIP is mainly driven by a negative volume of net equity and FDI. On other hand, the remaining GCC members were experiencing a positive trend mainly driven by large net IIP from debt securities.

From the above overview, it seems that Bahrain and the UAE are in a better position to hedge against output shocks, while much lower smoothing is expected in the case of Oman.

4.3.3 Home bias as an explanation for low international diversification

Given the potential gains from international diversification, empirical studies find that investors tend to prefer domestic investments and ignore foreign investments that may offer higher return plus the advantage of risk diversification. Such preference toward domestic investment is what is referred to as the *Home Bias*.

The issue of home bias is one of the major puzzles in international finance, and has been reviewed in much of the literature as a potential explanation for the low international risk sharing. For instance, Coval and Moskowitz (1999) find that U.S. investment managers exhibit a strong preference for their own geographical area. They notice that firms which are held locally have abnormal performance, which they retain to the presence of information advantages that motivate regional investments. A major question in the related literature is: why do individuals/countries fail to hold the optimal portfolio that provides hedging against risk? Lewis (1999) surveyed the literature relevant to the issue of equity home bias and consumption home bias in order to explain the reasons behind this bias.[95] Among the explanations are: (1) home assets may provide better hedges against home country-specific risk in addition to uncertainty in home non-tradable goods consumption; and (2) the cost of diversification exceeds the gains. In a recent empirical paper, Sørensen *et al.* (2007) showed that international home bias has declined over the period 1993-2003, while risk sharing has increased for OECD countries.

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[95] Consumption home bias refers to the phenomenon that domestic consumption is more correlated with domestic output than would be suggested if domestic investors had optimally sold off claims on their output to foreigners (Lewis, 1999).

4.3.3.1   Measuring equity home bias for GCC countries

Measuring equity home bias for GCC countries would give an overall indicator about their investment preference and behaviour over recent years. Following the identification in major literature, e.g. that of Warnock (2002) and Sørensen *et al.* (2007) , equity home bias will be calculated as follows:

$$Equity\ Home\ Bias = \frac{1 - (Foreign\ Equity\ ratio\ in\ Total\ Equity\ Portfolio)}{(1 - Domestic\ Market\ Share\ of\ the\ World)} \qquad (4.1)$$

where foreign equity represents ownership of foreign equities. The total equity portfolio of a country is market capitalization plus foreign equity held minus amount of a country's equity held by foreigners.[96] The domestic market share of the world is the ratio of stock market capitalization of a country to stock market capitalization of the world, where stock market capitalization of the world is the sum of the stock market capitalization of developed and emerging stock markets. Data on foreign equity-holding and equity held by foreigners are taken from Lane and Milesi-Ferretti (2006); domestic and world stock market capitalizations are taken from the World Bank's World Economic Indicators. The equity home bias will be calculated from the period 1998-2004, when data became available. The value of equity home bias would normally range between 0 and 1. A value of one is interpreted thus: 100 percent of a country's equity investment is invested domestically. On the other hand, a value of 0 implies that a country shows no preference for domestic equity.

Table 4.3 and Figure 4.37 present the calculated index for GCC countries, where Kuwait, Oman and Qatar show a 100 percent preference for domestic equity. Similarly, Saudi Arabia shows a near perfect preference for domestic equity. Bahrain shows a small drop on average where, by 2004, the equity home bias was lower by 13 percent than in 1998. The UAE, which is considered the most diversified GCC country, shows a very low preference for domestic equities in the early years. The index increased sharply by 267 percent in 2002, showing a rising interest in domestic equities. By 2004, it had increased by 82 percent, indicating a continuous rise in the

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[96] Equity held by foreigners is calculated as the sum of country *i* equity held by other countries.

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preference for domestic equities, but still maintaining more preferences for foreign equities.

The overall high equity home bias implies that most GCC countries are probably not smoothing output fluctuations through cross-ownership of equity assets. However, Sørensen *et al.* (2007) argue that, even if home bias is high, agents can smooth consumption through borrowing and lending if shocks are temporary, but not if they are permanent. Therefore, it would be vital to balance investments according to the type of shocks. Computing a similar index for home bias in debt and FDI would be useful for obtaining a broader picture of the investment diversification. Unfortunately, constructing these indexes is not feasible, owing to the absence of data.

4.4 Income and consumption smoothing by the GCC countries

Two empirical approaches will be applied in this essay to explore and quantify income and consumption smoothing patterns in the GCC countries. The first approach will aim to quantify the extent of income and consumption smoothing obtained through capital and credit markets. The second part will investigate the role of investment portfolio diversification in income and consumption smoothing. More specifically, the empirical question will be whether higher foreign assets and liabilities are conducive to the attainment of higher income and consumption smoothing by the GCC countries.

4.4.1 Channels of income and consumption smoothing

The aim of this section is to shed light on the channels through which income and consumption smoothing take place. More specifically, the amount of smoothing obtained through net factor income, and governments' pro-cyclical saving will be quantified.

The net factor income from foreign assets is represented by the difference between Gross National Income (GNI) and GDP, and will denote the role of the capital market. National saving will be represented by the difference between GNI and total consumption, and this can denote the role of the credit market.

Through capital markets, agents in one country can insure their income by holding claims to output on other countries where outputs are uncorrelated. For instance, if the GDP in Bahrain falls in one year as the result of a domestic shock, national income will not fall by the same ratio as GDP if the government and residents of Bahrain hold foreign assets which provide them with dividend and interest income. The second channel, the credit market, allows agents to adjust their wealth to smooth output fluctuations by borrowing and lending in addition to buying and selling in domestic assets. As discussed above, the capital market is effective for smoothing permanent and transitory shocks, while the credit market is effective only for transitory shocks.

4.4.1.1 Methodology

The approach will closely follow the widely-used methodology developed by Asdrubali *et al.* (1996), which is based on decomposing cross-sectional variance in income within a group of countries. The idea is to break cross-sectional consumption smoothing into several levels. A full explanation of the methodology is explained in appendix 4.A. The following panel equations will be considered to test for income and consumption smoothing by the GCC countries:

$$\Delta Log\ GDP_{it} - \Delta Log\ GNI_{it} = \nu_{F,t} + \alpha_{F,i} + \beta_F\ \Delta Log\ GDP_{i,t}'' + \varepsilon_{i,Ft}$$

$$\Delta Log\ GNI_{it} - \Delta Log\ C_{it} = \nu_{C,t} + \alpha_{C,i} + \beta_C\ \Delta Log\ GDP_{i,t}'' + \varepsilon_{i,Ct} \qquad (4.2)$$

$$\Delta Log\ C_{it} = \nu_{U,t} + \alpha_{U,i} + \beta_U\ \Delta Log\ GDP_{i,t}'' + \varepsilon_{i,Ut}$$

where GDP_{it}, GNI_{it} and C_{it} are country's i per capita Gross Domestic Product, Gross National Income, and Consumption at year t, respectively. All variables are transformed by taking the logarithms and first difference. $\Delta Log\ GDP_{it}''$ is the log difference of country-specific output growth, where the group's output growth is subtracted from each country's output. $\nu_{,t}$ is time-fixed effect that captures the time-specific impact on growth rates and α_i is country-fixed effect. $\varepsilon_{,t}$ represents error terms.

The first smoothing channel, net factor income from abroad, can be identified as the income insurance provided by the capital market in which assets can be traded. β_F is interpreted as the smoothing of country-specific GDP shocks carried out by net factor income. If we assume there is no income insurance from net factor income, $\Delta Log\,GDP_{it}$ and $\Delta Log\,GNI_{it}$ would have a perfect co-movement. If this is the case ($\Delta Log\,GDP_{it}$ - $\Delta Log\,GNI_{it}$) on the left side of equation (4.2) would be zero, implying an estimate of $\beta_F = 0$.

The second channel is obtained through national saving. Consumption can be smoothed through adjustments to saving, which can take place through lending and borrowing in the credit market. β_C is interpreted as the smoothing of GDP shocks carried out by changes in national saving. β_U in the last equation quantifies the fraction of shocks to GDP that remain unsmoothed. In other words, it can be interpreted as the fraction of income volatility that is not smoothed by the above two channels.

4.4.1.2 Data and results

The data set comprises annual observations over the period 1980-2005 for the six GCC countries. Data for GDP, GNI, and consumption are taken from the IMF database, the World Bank's world development indicators and the World Penn data. All data are in per capita terms and expressed in constant U.S. dollars, based on year 2000 prices. In order to control for the impact of Kuwait's invasion in 1990-1991, which had a major impact on output and consumption, a dummy variable will be added which will take a value of one for Kuwait's observation in 1990, 1991, and 1992. The results will be based on panel regression with heteroskedastic standard error.

Table 4.4 shows the estimated percentage of GDP shocks smoothed through net factor income and savings channels, in addition to shocks that remained unsmoothed. In order to gain more insight into the smoothing behaviour, the equations are also estimated over two periods, 1980-1991 and 1992-2005. The majority of estimates turned out to be highly significant.

For the whole period, the estimate of β_U, capturing fraction of unsmoothed shocks, shows that the bulk of the idiosyncratic shocks to the GDP of the GCC countries, 61.4 percent, remain unsmoothed. Revenue from oil and gas constitutes the largest source of income for the GCC countries, ranging between 20 percent and 47 percent in case of Bahrain and Qatar, respectively.[97] Given this and the size of unsmoothed shocks, fluctuations in prices of oil and gas do play a major role in determining shocks to income and consumption. As argued by Mélitz and Zumer (1999), diversifying sources of income away from natural resources should be larger for regions dominated by mineral industries. Among the smoothed shocks, 12.5 percent are smoothed through the net factor income channel, while 27.2 percent of the shocks are smoothed via the saving channel. As argued by Sørensen and Yosha (1998), smoothing via saving doesn't need to involve cross-country flows of fund, but can be reflected in domestic investment.

Over the first sub-period (1980-1991), 11.2 percent of the shocks are smoothed via net factor income, while higher smoothing is achieved via the saving channel. Slightly higher than that in the full period, 63.6 percent of the shocks remained unsmoothed. The second period, on the other hand, shows a larger role of net factor income where its impact rises by 28 percent, compared with the first period, while smoothing via saving channel is slightly lower. The rise in the role of net factor income in smoothing output shocks for the GCC countries since 1992 could be partially explained by a clear rise in foreign assets during the second period for most GCC countries after much lower growth during the first period. More specifically, equity assets have been remarkably increased in Bahrain, Saudi Arabia and the UAE, while FDI assets also have witnessed a remarkable increase in all countries, with the exception of Kuwait. The rise in these foreign investments is probably fuelled by rising oil prices which therefore increase governments' national income. More analysis of the role of foreign assets will be discussed in the next section.

In order to put the results into perspective, it would be interesting to compare them with the results from other regional groups. Table 4.5.1 includes estimates by Balli (2007), who tested for income smoothing via net factor income and saving for

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[97] Based on average contribution of natural resources to GDP for the period 1994-2004. See tables 3.5-3.10 for the percentage of sectors contribution to GDP for each GCC country.

EMU and OECD-EMU countries during the period 1981-2003. [98] Prior to the introduction of the Euro in 1999, net factor income in the EU and OECD-EU countries did not show any significant impact on income smoothing, while EMU counties had low smoothing prior to that time. For the OECD-EMU sample, the coefficient of factor income is negative, showing that net factor income contributes to income dis-smoothing, even though these countries are diversifying their portfolios. Balli (2007) argues that such a result is probably the outcome of limited industrial specialization among OECD countries which mostly experience symmetrical shocks to output. Table 4.5.2 displays results for GCC countries during the same period in Table 4.5.1. The result implies a much higher income smoothing via net factor income for the GCC, while the level of consumption smoothing via saving is similar to the level for EU and EMU countries during the early period (1981-1990). The later period, however, shows a smaller role for the saving channel for the GCC.

Kim *et al.* (2006), Table 4.5.3, test for similar issues for East Asian countries during the period 1971-2000.[99] Their results suggest very low smoothing via net factor income, and positive but falling smoothing via saving. Estimates for similar periods for the GCC, (Table 4.5.4), show a much larger income smoothing via net factor income. In the later period, the GCC smoothing via saving becomes higher than that of East Asia, implying a better overall income and consumption smoothing by the GCC.

Finally, Table 4.5.5 shows the estimates of Yehoue (2005) who focus on the CFA area, CEMAC and the WAEMU countries during the period 1980-2000.[100] The estimates of the shock smoothing via net factor income and saving were not significant in the CEMAC and the WAEMU countries for all periods. Unsmoothed shocks, on the other hand, were significant, indicating that only about 15 and 13 percent of shocks are smoothed in the CEMAC and WAEMU, respectively. The result

[98] EMU: Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Spain, and Portugal. OECD-EMU: Australia, Canada, Denmark, Iceland, Japan, Korea, New Zealand, Norway, Singapore, Switzerland, Sweden, UK, and United States.

[99] East Asian countries: Indonesia, Malaysia, Philippines, Singapore, Thailand, Hong Kong, China, Korea, Japan, and Taiwan.

[100] CEMAC stands for African Economic and Monetary Community. WAEMU stands for West African Economic and Monetary Union.

for the GCC countries, Table 4.5.6, shows a significant and much larger role played by the saving channel.

Though not substantial, the share of shocks smoothed by the GCC countries through the net factor income channel is higher than in many major regional groups, showing an incremental importance in recent years. The saving channel, on the other hand, shows a higher smoothing pattern when compared with East Asian and the CFA countries.

4.4.2 Income and consumption smoothing by the GCC countries: the role of investment portfolio diversification

In order to insulate income from output fluctuations, countries tend to diversify their investments portfolio by holding international financial assets and liabilities. The integration in financial markets provides countries with opportunities to own output claims in other countries, which contribute to consumption smoothing by stabilizing national income. The 1990s has been associated with a noticeable financial openness, where gaining an insight into the pattern of income and consumption smoothing during the two periods (1980-1991, 1992-2004) would be important for evaluating the impact of financial openness.

Perfect income smoothing with respect to the GCC countries can occur in the event that each GCC country holds assets and liabilities that make its income proportional to aggregate GCC output. On the other hand, perfect consumption smoothing would represent the situation in which consumption grows at the same rate in all the GCC countries. Demyanyk *et al.* (2008) argue that while perfect risk sharing is unlikely to be achieved, a high degree of risk sharing can be obtained if the return on foreign assets is highly associated with a regional group's output growth and the return on foreign liabilities is highly associated with domestic output growth. Over recent years, the GCC countries have witnessed more financial openness, which is expected to contribute to higher income and consumption smoothing. However, the overall high share of debt components relative to equity and FDI raises a concern of whether the GCC countries hold an inadequate amount or improper composition to effectively smooth income and consumption. In this regard, Milesi-Ferretti and Razin

(1996) argue about the preference of FDI liabilities to debt, as they show low sensitivity to domestic shocks.

4.4.2.1 Methodology

The empirical exercise in this section complements the earlier exercise by focusing on the role of investment portfolio diversification on smoothing income and consumption. The aim will be to assess whether foreign assets and liabilities are conducive to attaining higher income and consumption smoothing by the GCC countries. The empirical approach will closely follow that of Sørensen *et al.* (2007) which quantifies deviations from perfect income and consumption smoothing. Their methodology is based on the following:

$$\left(\Delta Log\, GNI_{it} - \Delta Log\, GNI_t\right) = c + \beta_F\left(\Delta Log\, GDP_{i,t} - \Delta Log\, GDP_t\right) + \varepsilon_{it} \qquad (4.3)$$

where $\Delta Log\, GNI_{it}$ and $\Delta Log\, GDP_{i,t}$ are country's *i* first difference of the log of per capita GDP and GNI at year *t*, respectively. GNI_t and GDP_t are the year *t* average per capita aggregate GNI and GDP for a group of countries. β_F measures the average co-movement of the idiosyncratic GNI growth with their idiosyncratic GDP growth in year *t*. In other words, β_F measure the amount of smoothing provided by net factor income. Greater income smoothing is attained as the co-movement gets smaller, where perfect smoothing is reached when idiosyncratic GNI is uncorrelated with GDP growth. If this is the case, the value of β_F will be zero as the GNI growth of each country equals the GNI growth of the GCC countries as a group. In the case of no smoothing, GNI would move perfectly with GDP resulting in a value of 1 for β_F. As suggested by Sørensen *et al.*(2007), it would be more instructive to look at the equivalent of $(1 - \beta_f)$; therefore a value of 1 indicates a perfect smoothing, while a value of 0 indicates no smoothing as GNI moves perfectly with output.

In a similar way, a regression for consumption smoothing takes the following form:

$$\left(\Delta Log\, C_{it} - \Delta Log\, C_t\right) = c + \beta_{C,t}\left(\Delta Log\, GDP_{i,t} - \Delta Log\, GDP_t\right) + \varepsilon_{it} \qquad (4.4)$$

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where C_{it} is country's i per capita final consumption at year t; $\bar{C}_{it}$ is the average per capita aggregate final consumption for the group at year t. $\beta_{C,t}$ measures the average co-movement of the idiosyncratic consumption growth with their idiosyncratic GDP growth in year t. The equation provides a measure of the extent of consumption smoothing, where greater smoothing is attained as the co-movement gets smaller.

To control for the impact of other factors that have an impact on income and consumption smoothing, Sørensen *et al.* (2007) re-estimate equations (4.3) and (4.4) in the following forms:

$$\Delta Log\ GNI_{it} - \Delta Log\ GNI_t = c + k(\Delta Log\ GDP_{i,t} - \Delta Log\ GDP_t) + \varepsilon_{it} \qquad (4.5)$$

$$\Delta Log\ C_{it} - \Delta Log\ C_t = c + k\ (\Delta\ Log\ GDP_{i,t} - \Delta\ Log\ GDP_t) + \varepsilon_{it} \qquad (4.6)$$

where for equation (4.5), k measures the average co-movement of the idiosyncratic GNI growth with their idiosyncratic GDP growth over the sample period. $(1-k)$ can be interpreted as a measure of the average amount of income smoothing provided by factor income. Mélitz and Zumer (1999) impose a structure on k, where $k = k_0 + k_1 \gamma_1 + k_2 \gamma_2$. γ_i is an interaction variable that may potentially have an impact on the smoothing obtained by country i. A measure of the amount of income and consumption smoothing would equal $[1 - k_0 - k_1 \gamma_i]$. Sørensen *et al.* (2007) enhance their structure by allowing k to change over time in the following form:

$$k = k_0 + k_1(t - \bar{t}) + k_2(x_{it} - \bar{x}_t) \qquad (4.7)$$

where t represents every year in the sample and $\bar{t}$ is the middle year of the sample period. x_{it} represents a factor that may affects income and consumption smoothing, and $\bar{x}_t$ is the average of factor x across countries at year t. The amount of smoothing within the group would equal 1-k_0. Similarly, $1 - k_0 - k_1(t - \bar{t}) - k_2(x_{it} - \bar{x}_t)$ would be interpreted as a measure of the amount of smoothing obtained by country i in year t with the impact of factor x_{it}. The parameter k_1 captures the average yearly changes in income and consumption smoothing. If we assume, for instance, that x_{it} is a measure of total financial assets, then k_2 measures how much higher than average

financial assets would increase the amount of income and consumption smoothing obtained.

Based on the above approach, the second empirical approach to be estimated will take the following form:

$$\Delta Log\ GNI_{it} - \Delta Log\ GNI_t = c + v_{F,t} + \alpha_{F,i} + \beta_{k0}(\Delta Log\ GDP_{i,t} - \Delta Log\ GDP_t)$$
$$+ \beta_{k1}(\Delta Log\ GDP_{i,t} - \Delta Log\ GDP_t)*(t - \bar{t})$$
$$+ \beta_{k2}(\Delta Log\ GDP_{i,t} - \Delta Log\ GDP_t)*(FIN_{it} - \overline{FIN}_t) + \varepsilon_{it} \quad (4.8)$$

where FIN_{it} will represent an interaction term that is expected to have an impact on the amount of income and consumption smoothing, which takes one of the following:[101]

- Debt assets
- FDI assets
- Debt liability
- FDI liability
- Financial openness = (Total assets + Total liability)

Each variable is normalized by dividing it by GDP and then transformed by taking its log. The term 'assets' refers to ownership of foreign investment held by domestic investors, while 'liabilities' refers to foreigners' ownership in domestic investment. 'Debt' refers to debt securities. $v_{F,t}$ and $\alpha_{F,i}$ represent time- and country fixed effect.

A similar form is estimated for consumption smoothing, which takes the following:

$$\Delta Log\ C_{it} - \Delta Log\ C_t = c + v_{C,t} + \alpha_{C,i} + \beta_{\gamma 0}(\Delta Log\ GDP_{i,t} - \Delta Log\ GDP_t)$$
$$+ \beta_{\gamma 1}(\Delta Log\ GDP_{i,t} - \Delta Log\ GDP_t)*(t - \bar{t})$$
$$+ \beta_{\gamma 2}(\Delta Log\ GDP_{i,t} - \Delta Log\ GDP_t)*(FIN_{it} - \overline{FIN}_t) + \varepsilon_{it} \quad (4.9)$$

where FIN_{it} take the exact values as defined above.

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[101] Equity assets and liabilities will not be included owing to a shortage of data.

In terms of the interactions' signs interpretation, a negative coefficient on the interaction with $(FIN_{it} - \overline{FIN_t})$ means that a rise in the level of financial assets or liabilities would be associated with a fall in the co-movement of GNI and output, which implies a contribution to higher smoothing. Similarly, the interpretation of higher financial assets and liabilities would be the same within equation (4.9). In general, it is expected that foreign assets would provide higher smoothing than liabilities.

4.4.2.2   Data and results

The data set comprises annual data over the period 1980-2004 for the six GCC countries. Data for GDP, GNI, and consumption are taken from the IMF database, the World Bank's world development indicators and the World Penn data. All data are in per capita terms and expressed in constant U.S. dollars, based on year 2000 prices. Data on financial assets and liabilities are taken from the findings of Lane and Lilesi-Ferretti (2006), where data are available up to 2004. A dummy variable controlling for the impact of the Kuwait invasion will be added, and will take a value of one for Kuwait's observation in 1990, 1991, and 1992. The results will be based on panel regression with heteroskedastic standard error.

The results for income and consumption smoothing are presented in Tables 4.6 and 4.7, respectively. Column (1) includes estimates with the idiosyncratic GDP growth, $(\Delta GDP_{it} - \Delta GDP_t)$, and time trend only, while columns 2-6 include estimates with foreign financial assets and liabilities which aim to test if higher foreign assets and liabilities are associated with higher smoothing. All estimates on $(\Delta GDP_{it} - \Delta GDP_t)$ are highly significant.

For income smoothing, the estimate in column (1) in Table 4.6 display co-movement of GNI and output, which indicates an average co-movement of 88.9 percent between the countries' idiosyncratic GNI-growth and their idiosyncratic GDP growth. In other words, there is an average income smoothing of 11.1, which is similar to the results of equation (4.2) in Table 4.4.

Estimates controlling for output interaction with debts and FDI assets show similar co-movement patterns of GNI with GDP, where both debt and FDI are insignificant. The positive sign on debt implies that holding higher debt assets doesn't insulate the growth of GNI from GDP; therefore, there is no contribution to income smoothing. The sign on FDI assets is negative as expected, which implies a potential contribution to higher income smoothing. Figures 4.3, 4.8, 4.12, 4.17, 4.22, and 4.27 show a rising trend for FDI assets for all countries, except Kuwait, which give more support to the role of FDI assets in smoothing income. In column (4), debt liability is positive and significant, implying that average income smoothing falls with higher holdings of debt liabilities. Turning positive and insignificant, estimates on FDI liabilities' financial openness show no support for improving income smoothing.

Estimates for consumption smoothing are presented in Table 4.7, where all estimates of the average smoothing turned highly significant. In particular, when controlling for foreign assets, average consumption smoothing is higher than that of income smoothing, as can be seen from the lower average co-movement of consumption and output. For instance, the point estimates in column (1) of 0.67 indicate that 33 percent of consumption smoothing is shared within the country level. Among the assets and liabilities, only debt liabilities turned significant. Its positive sign and large size indicates a negative impact on consumption smoothing, which is similar to its impact on income smoothing from equation (4.8). Debt liability represents by far the highest component of liabilities; therefore the result is not unexpected. Overall, neither foreign assets components nor FDI liabilities seem to promote higher consumption smoothing.

Tables 4.8 and 4.9 show the estimates of income smoothing during two periods (1980-1991, 1992-2004), where all estimates in the first row turned highly significant. Results show major changes compared with the full period. What is noticeable is the association of the earlier period with much lower income smoothing, compared with the later period. As discussed above, high foreign investments have been growing since the early 1990s, where the results corroborate its impact. The average co-movement of GNI and output in the first period is very high, indicating a poor contribution to income smoothing. All interactions turned out to be insignificant,

where FDI assets and liabilities became negative, supporting the hypothesis that holding higher FDI assets and liabilities increases income smoothing.

The estimates for the second period show interesting findings. The results in column (1) of Table 4.9 imply that an average of 21.3 percent of the shocks in each country is smoothed via foreign investments, compared with 4 and 11 percent in the first and full periods, respectively. Among all interactions, only liabilities components (FDI and debt) are significant and support the expectations of negative impact on income smoothing.

The estimates for consumption smoothing for the periods (1980-1991) and (1992-2004) are presented in Tables 4.10 and 4.11, where all estimates in the first row turned highly significant. A comparison of the two sub-periods reveals that only the later period (1992-2004) shows a high smoothing of at least 43.2 percent in all estimates. The early period, on the other hand, shows no signs of smoothing, but a consumption dis-smoothing. In a similar pattern over the full sample, debt liability in the early period was the only significant interaction coefficient, where its positive and large size is an indicator of its importance. Figures 4.5, 4.9, 4.14, 4.18, 4.23 and 4.29, showing the size of debt liability relative to GDP, indicate an overall upward trend during most of the 1980s. This trend might suggest that the increased availability of credit could cause temporary shifts in consumption and therefore lead to the consumption dis-smoothing. Demyanyk *et al.* (2008) find consumption dis-smoothing in their analysis of EMU and EU countries, and argue that such dis-smoothing might be caused by a temporary shift in consumption in response to, for example, taste shocks or increased availability of credit. However, further investigation on this issue is beyond the scope of this essay.

Overall, consumption smoothing is shown to play a greater role across the GCC countries than that of income smoothing. Assets components seem to have no role in insulating income and consumption from output fluctuation. Liabilities, on the other hand, show a tendency to reduce income and consumption smoothing.

4.5   Conclusion

Since the early 1990s, the GCC countries have witnessed a noticeable increase in foreign assets and liabilities. However, the share of equity and FDI relative to GDP are still small, where the majority of the countries tend to experience high preference for domestic equity investments. The analysis of the income and consumption smoothing channels shows that less than 40 percent of the shocks to output are smoothed, where over 27 and 12 percents of the shocks are smoothed via the national saving and net factor income channels, respectively. Though lower than that achieved within the U.S., the level of smoothing via net factor income by the GCC countries is found to be higher than smoothing achieved by many regional entities such as the EU, EMU and East Asia. Furthermore, the results are encouraging when comparing the role played by the saving channel.

The analysis of the role of investment portfolio diversification shows that a rising trend toward financial openness is accompanying lower co-movement between the GNI and output in recent years. However, it seems that these assets holdings are still too small to expect a contribution to a significant smoothing. For instance, equity assets are absent and FDI is very small relative to GDP in most of the GCC portfolios. Debt components strongly dominate the group portfolio, but the results show a significant association of debt liabilities with lower income and consumption smoothing. Such a result confirms the argument in the literature that transitory, but not permanent, shocks are smoothed via debt stocks.[102] Furthermore, the limited role of financial portfolios can be due to the limited integration of GCC countries into the global market. Kose et al.(2007) suggest that there is a threshold effect for the gains from financial integration, where gains are limited to countries that are substantially integrated into global markets.

The GCC countries are highly specialized in natural resources industries which make their income and consumption more volatile than that of other regional countries. If such a trend of specialization is to remain the same, higher income and consumption smoothing is required in order to hedge against risk to output. Mélitz

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[102] See Asdrubali *et al.* (1996), Becker and Hoffmann (2006) and Kose *et al.(*2007)

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and Zumer (1999) argue that the role of smoothing via the capital market should be larger for regions dominated by mineral industries, e.g. GCC countries, which tend to experience persistent shocks. Unless investment portfolio diversification is based on hedging consideration and targeted toward markets that are asymmetric to the GCC output, it will not be expected that these diversifications will provide significant insurance. The shift of portfolio investments from debt securities into FDI and equity, which tend to be more stable, would be expected to promote effective income and consumption smoothing. The recent spike in oil prices has provided the GCC with large flows of income, where growth in the GCC countries ranged between 6 and 14 during the period 2005-2008.[103] This has enabled the GCC's Sovereign Wealth Funds to have an active role in acquiring foreign assets. Upon availability of data, future research should consider these recent investments and whether they have been conducive to higher income and consumption smoothing.

According to the above analysis, the GCC countries still have some way to go before reaching a fair level of risk sharing similar to that of the U.S. A much higher income and consumption smoothing by the GCC countries is expected in the near future. While it is too early to draw a definitive conclusion about its impact, the completion of a monetary union among the GCC countries, with an expected impact on trade, labour mobility and greater transparency, will have a potential for higher and more efficient income and consumption smoothing. Mundell (1973) and Mélitz and Zumer (1999) argue that an integration into a single monetary policy will promote smoothing of shocks through market channels, and therefore reduce the impact of losing monetary independence.

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[103] See table 4.B.1 in appendix 4.B.1

Table 4.1: Country level foreign assets holding relative to GDP (percent)

Country	Equity				Debt				FDI			
	Year											
	1980	1990	2000	2004	1980	1990	2000	2004	1980	1990	2000	2004
Bahrain	10.18	27.28	44.38	76.02	1023	1288	1156	867	19.48	15.88	21.98	36.59
Kuwait	0	0	0	0	177	538	209	245	3.64	20.02	3.85	6.71
Oman	0	0	0	0	22.04	41.07	21.90	24.44	0	0.06	0.12	0.09
Qatar	0	0	0	0	271	794	339	277	0	0.05	0.68	0.40
Saudi Arabia	0	0	1.09	0.91	69.33	107	54.96	76.13	0	2.03	1.68	1.30
UAE	8.05	104	153	133	79.76	181	93.08	97.45	0	0.03	1.82	1.67

Note: Assets referees to ownership of foreign investments held by domestic investors. Equity assets refers to ownership of shares of companies and mutual funds that are below the 10 percent. Debt assets refers to debt securities. FDI assets refers to Foreign Direct Investment.

Source: Lane and Lilesi-Ferretti (2006)

All zero values indicate no assets are reported.

Table 4.2: Country level foreign liabilities holding relative to GDP (percent)

Country	Equity				Debt				FDI			
	Year											
	1980	1990	2000	2004	1980	1990	2000	2004	1980	1990	2000	2004
Bahrain	0	0	0.32	6.07	1253	1253	1082	843	0	10.84	71.73	68.78
Kuwait	0	0	0	0.03	16.17	44.28	26.90	24.65	0.11	0.14	1.40	0.58
Oman	0	0	1.44	3.18	9.45	23.41	36.65	14.70	8.62	15.29	13.29	14.50
Qatar	0	0	0.21	0.12	8.80	34.21	90.76	55.19	2.20	2.18	10.80	16.60
Saudi Arabia	0	0	0	0.44	6.81	14.80	15.74	13.01	-	27.31	16.97	11.63
UAE	0	0	0.02	0.01	18.56	27.54	25.95	15.95	1.38	2.23	1.51	4.62

Note: Liabilities refers to foreigners ownership in domestic investments. Equity refers to shares of companies and mutual funds that are below the 10 percent. Debt refers to debt securities. FDI refers to Foreign Direct Investment.

Source: Lane and Lilesi-Ferretti (2006)

All zero values indicate no assets are reported.

Table 4.3: Equity Home Bias

Country	Year						
	1998	1999	2000	2001	2002	2003	2004
Bahrain	0.69	0.64	0.65	0.67	0.64	0.63	0.61
Kuwait	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Oman	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Qatar	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Saudi Arabia	0.97	0.97	0.97	0.98	0.98	0.99	1.00
UAE	0.09	0.06	0.05	0.06	0.22	0.23	0.42

Table 4.4: Income and consumption smoothing by the GCC countries (in percent)

Period	β_F	β_C	β_U	Observations
1980-2005	12.5***	27.2***	61.4***	152
	(4.7)	(9.76)	(9.87)	
1980-1991	11.2*	26.55*	63.6***	70
	(6.6)	(14.98)	14.4	
1992-2005	14.33***	25.12***	60.5***	82
	(4.97)	(7.93)	(8.9)	

Note β_F is the panel data regression of the slope in the regression of $\Delta \log GDP_{it} - \Delta \log GNI_{it}$ on $\Delta \log GDP_{it}$.

β_C is the panel data regression of the slope in the regression of $\Delta \log GNI_{it} - \Delta \log Cons_{it}$ on $\Delta \log GDP_{it}$.

β_C is the panel data regression of the slope in the regression of $\Delta \log Cons_{it}$ on $\Delta \log GDP_{it}$.

***,* represents significance at the 1percent and 10 percent level. Standard errors in parentheses, which is based on robust standard errors.

Table 4.5.1
Income smoothing through net factor income: EMU, EMU-OECD countries (in percent)*

	EU	EMU	OECD-EU
1981-1990	-2	1	-2
	(2)	(2)	(2)
1991-1999	0	3	-1
	(3)	(3)	(3)

Consumption Smoothing through Saving: EMU, EMU-OECD countries (in percent)*

	EU	EMU	OECD-EU
1981-1990	24	26	43
	(4)	(6)	(6)
1991-1999	34	41	47
	(6)	(7)	(9)

*Source: Balli (2007)

Note. EU: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Netherland, Spain
, and Portugal. EMU: Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Netherland,
Spain, and Portugal. OECD-EMU: Australia, Canada, Denmark, Iceland, Japan, Korea,
New Zealand, Norway, Singapore, Switzerland, Sweden, UK, and United States.
t-statistics in parentheses.

Table 4.5.2: Income and consumption smoothing by the GCC
(in percent)

Period	Net factor inocme	Saving
1981-1990	6.93	23.8
	(7.9)	(16.2)
1991-1999	19.5***	22.1**
	(6.56)	(10.7)

***,** represents significance at the 1percent and 5 percent level. Standard errors
in parentheses, which is based on robust standard errors.

Table 4.5.3: Income and consumption smoothing through net factor income and saving:
East Asian countries (in percent)*

Period	1981-1990	1987-1996	1991-2000
Net Factor Income	-1.2	2.7	-2.4
	(.013)	(.016)	(.012)
Saving	22	18.3	11.6
	(.063)	(.055)	(.06)

*Source: Kim et al.(2006)

Note: East Asian countries: Indonesia, Malaysia, Philippines, Singapore, Thailand, Hong Kong, China
Korea, Japan, and Taiwan.

Standard errors in parentheses

Table 4.5.4: Income and consumption smoothing by the GCC (in percent)

Period	1981-1990	1987-1996	1991-2000
Net Factor Income	6.93	22.9***	18.8***
	(7.9)	(8.3)	(6.13)
Saving	23.8	11.03	18.15*
	(16.2)	(14.72)	(10.78)

***,* represents significance at the 1percent and 10 percent level. Standard errors in parentheses, which is based on robust standard errors.

Table 4.5.5: Income and consumption smoothing through net factor income and saving: CEMAX** & WAEMU** countries (in percent)

	1980-2000	1980-93	1980-2000	1980-93
	CEMAC		**WAEMU**	
Net Factor Income	14	32	11	-1
	(0.95)	(1.56)	(0.83)	(-0.03)
Saving	8	-35	6	-7
	(.54)	(-1.39)	(.23)	(-.23)

*Source: Yehoue (2005)

CEMAC stands for African Economic and Monetary Community.*WAEMU stands for West African Economic and Monetary Union.

t-statistics in parentheses.

Table 4.5.6: Income and consumption smoothing by the GCC (in percent)

Period	1980-2000	1980-1993
Net Factor Income	12.67***	14.53***
	(4.84)	(5.42)
Saving	26.63***	27.48**
	(10)	(11.77)

***,** represents significance at the 1 percent and 5 percent level. Standard errors in parentheses, which is based on robust standard errors.

Table 4.6: Income smoothing among the GCC countries (Dependent variable: $\overline{GNI}_{it}$)

	(1)	(2)	(3)	(4)	(5)	(6)
$\overline{GDP}_{it}$	0.889	0.897	0.87	1.0	0.94	0.92
	(0.055)***	(0.062)***	(0.062)***	(.076)***	(0.078)***	(0.064)
Interaction terms with GDP:						
Debt assets		0.02				
		(0.037)				
FDI assets			-0.021			
			(0.035)			
Debt Liability				0.072		
				(0.032)**		
FDI Liability					0.023	
					(0.022)	
Financial openness						0.045
						(0.041)

$\overline{GDP}_{it}$ is the deviation in growth rate of country level GDP from the respective growth rate in the GCC – level GDP.

Variables on the first column are coefficients from the regression of the form:

$\Delta Log\ GNI_{it} - \Delta Log\ GNI_t = c + v_{F,t} + \alpha_{F,i} + \beta_{k0}(\Delta Log\ GDP_{i,t} - \Delta Log\ GDP_t) + \beta_{k1}(\Delta Log\ GDP_{i,t} - \Delta Log\ GDP_t) * (t - \bar{t})$

$+ \beta_{k2}(\Delta Log\ GDP_{i,t} - \Delta Log\ GDP_t) * (FIN_{it} - \overline{FIN}_t) + \varepsilon_{it}$

Where FIN takes the form of "debt assets", "FDI assets", "debt liability", "FDI liability" or "financial openness". Constant, time trend and country fixed effect are included in all equations.

***, ** represents significance at the 1 percent, and 5 percent level, respectively. Standard errors in parentheses, which is based on robust standard errors.

Table 4.7: Consumption smoothing among the GCC countries (Dependent variable: $\overline{Cons}_{it}$)

	(1)	(2)	(3)	(4)	(5)	(6)
$\overline{GDP}_{it}$	0.67	0.70	0.67	0.975	0.795	0.761
	(0.09)***	(0.114)***	(0.12)***	(0.176)***	(0.152)***	(0.123)
Interaction terms with GDP:						
Debt assets		0.05				
		(0.077)				
FDI assets			0.04			
			(0.079)			
Debt Liability				0.197		
				(0.09)**		
FDI Liability					0.057	
					(0.045)	
Financial openness						0.134
						(0.11)

$\overline{GDP}_{it}$ is the deviation in growth rate of country level GDP from the respective growth rate in the GCC – level GDP.

Variables on the first column are coefficients from the regression of the form:

$$\Delta Log \ C_{it} - \Delta Log \ C_t = c \ + v_{C,t} + \alpha_{C,i} + \beta_{\gamma 0} \ (\Delta Log \ GDP_{i,t} - \Delta Log \ GDP_t) + \beta_{\gamma 1} \ (\Delta Log \ GDP_{i,t} - \Delta Log \ GDP_t) * (t - \bar{t})$$

$$+ \beta_{\gamma 2} \ (\Delta \ Log \ GDP_{i,t} - \Delta Log \ GDP_t) * (FIN_{it} - \overline{FIN}_t) + \varepsilon_{it}$$

Where FIN takes the form of "debt assets", "FDI assets" , "debt liability", "FDI liability" or "financial openness". Constant, time trend and country fixed effect are included in all equations.

***, ** represents significance at the 1 percent, and 5 percent level, respectively. Standard errors in parentheses, which is based on robust standard errors.

Table 4.8: Income smoothing among the GCC countries (Dependent variable: $\overline{GNI}_{it}$) 1980-1991

	(1)	(2)	(3)	(4)	(5)	(6)
$\overline{GDP}_{it}$	0.96	0.969	0.835	1.04	0.966	.981
	(0.22)***	(0.22)***	(0.22)***	(0.21)***	(0.227)***	(0.215)***
Interaction terms with GDP:						
Debt assets		0.013				
		(0.044)				
FDI assets			-0.025			
			(0.05)			
Debt Liability				0.071		
				(0.053)		
FDI Liability					-0.01	
					(0.057)	
Financial openness						0.042
						(0.055)

$\overline{GDP}_{it}$ is the deviation in growth rate of country level GDP from the respective growth rate in the GCC – level GDP.

Variables on the first column are coefficients from the regression of the form:

$$\Delta Log \; GNI_{it} - \Delta Log \; GNI_t = c + \nu_{F,t} + \alpha_{F,i} + \beta_{k0}(\Delta Log \; GDP_{i,t} - \Delta Log \; GDP_t) + \beta_{k1}(\Delta Log \; GDP_{i,t} - \Delta Log \; GDP_t)*(t - \bar{t})$$

$$+ \; \beta_{k2}(\Delta Log \; GDP_{i,t} - \Delta Log \; GDP_t)*(FIN_{it} - \overline{FIN}_t) + \varepsilon_{it}$$

Where FIN takes the form of "debt assets", "FDI assets" , "debt liability", "FDI liability" or "financial openness". Constant, time trend and country fixed effect are included in all equations.

***, ** represents significance at the 1 percent, and 5 percent level, respectively. Standard errors in parentheses, which is based on robust standard errors.

Table 4.9: Income smoothing among the GCC countries (Dependent variable: $\overline{GNI}_{it}$) 1992-2004

	(1)	(2)	(3)	(4)	(5)	(6)
$\overline{GDP}_{it}$	0.787	0.837	0.768	0.92	0.987	0.854
	(0.04)***	(0.05)***	(0.048)***	(0.067)***	(0.13)***	(0.057)***
Interaction terms with GDP:						
Debt assets		0.07				
		(0.047)				
FDI assets			0.05			
			(0.036)			
Debt Liability				0.077		
				(0.034)**		
FDI Liability					0.047	
					(0.029)**	
Financial openness						0.079
						(0.05)

$\overline{GDP}_{it}$ is the deviation in growth rate of country level GDP from the respective growth rate in the GCC – level GDP.

Variables on the first column are coefficients from the regression of the form:

$$\Delta Log\ GNI_{it} - \Delta Log\ GNI_t = c + \nu_{F,t} + \alpha_{F,i} + \beta_{k0}(\Delta Log\ GDP_{i,t} - \Delta Log\ GDP_t) + \beta_{k1}(\Delta Log\ GDP_{i,t} - \Delta Log\ GDP_t) * (t - \bar{t})$$

$$+ \beta_{k2}(\Delta Log\ GDP_{i,t} - \Delta Log\ GDP_t) * (FIN_{it} - \overline{FIN}_t) + \varepsilon_{it}$$

Where FIN takes the form of "debt assets", "FDI assets" , "debt liability", "FDI liability" or "financial openness". Constant, time trend and country fixed effect are included in all equations.

***, ** represents significance at the 1 percent, and 5 percent level, respectively. Standard errors in parentheses, which is based on robust standard errors.

Table 4.10: Consumption smoothing among the GCC countries (Dependent variable: $\overline{Cons}_{it}$) 1980-1991

	(1)	(2)	(3)	(4)	(5)	(6)
$\overline{GDP}_{it}$	1.148	1.22	1.04	1.47	1.32	1.25
	(0.37)***	(0.39)***	(0.393)***	(.0422)***	(0.42)***	(0.386)***
Interaction terms with GDP:						
Debt assets		0.105				
		(0.14)				
FDI assets			0.084			
			(0.105)			
Debt Liability				0.26		
				(0.126)**		
FDI Liability					0.048	
					(0.087)	
Financial openness						0.195
						(0.157)

$\overline{GDP}_{it}$ is the deviation in growth rate of country level GDP from the respective growth rate in the GCC – level GDP.

Variables on the first column are coefficients from the regression of the form:

$\Delta Log \quad C_{it} - \Delta Log \quad C_t = c + v_{C,t} + \alpha_{C,i} + \beta_{\gamma 0} (\Delta Log \quad GDP_{i,t} - \Delta Log \quad GDP_t) + \beta_{\gamma 1} (\Delta Log \quad GDP_{i,t} - \Delta Log \quad GDP_t) * (t - \bar{t})$

$+ \beta_{\gamma 2} (\Delta Log \quad GDP_{i,t} - \Delta Log \quad GDP_t) * (FIN_{it} - \overline{FIN}_t) + \varepsilon_{it}$

Where FIN takes the form of "debt assets", "FDI assets" , "debt liability", "FDI liability" or "financial openness". Constant, time trend and country fixed effect are included in all equations.

***, ** represents significance at the 1 percent, and 5 percent level, respectively. Standard errors in parentheses, which is based on robust standard errors .

Table 4.11: Consumption smoothing among the GCC countries (Dependent variable: $\overline{Cons}_{it}$) 1992-2004

	(1)	(2)	(3)	(4)	(5)	(6)
$\overline{GDP}_{it}$	0.49	0.442	0.424	0.548	0.568	0.484
	(0.11)***	(.0153)***	(0.138)***	(0.2)***	(0.277)***	(0.171)***
Interaction terms with GDP:						
Debt assets		-0.048				
		(0.125)				
FDI assets			0.023			
			(0.107)			
Debt Liability				0.044		
				(0.084)		
FDI Liability					0.023	
					(0.058)	
Financial openness						0.012
						(0.129)

$\overline{GDP}_{it}$ is the deviation in growth rate of country level GDP from the respective growth rate in the GCC – level GDP.

Variables on the first column are coefficients from the regression of the form:

$$\Delta Log \ C_{it} - \Delta Log \ C_t = c + \nu_{C,t} + \alpha_{C,i} + \beta_{\gamma 0} (\Delta Log \ GDP_{i,t} - \Delta Log \ GDP_t) + \beta_{\gamma 1} (\Delta Log \ GDP_{i,t} - \Delta Log \ GDP_t) * (t - \bar{t})$$

$$+ \beta_{\gamma 2} (\Delta Log \ GDP_{i,t} - \Delta Log \ GDP_t) * (FIN_{it} - \overline{FIN}_t) + \varepsilon_{it}$$

Where FIN takes the form of "debt assets", "FDI assets", "debt liability", "FDI liability" or "financial openness". Constant, time trend and country fixed effect are included in all equations.

***, ** represents significance at the 1 percent, and 5 percent level, respectively. Standard errors in parentheses, which is based on robust standard errors .

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Figure 4.1: Bahrain's equity assets
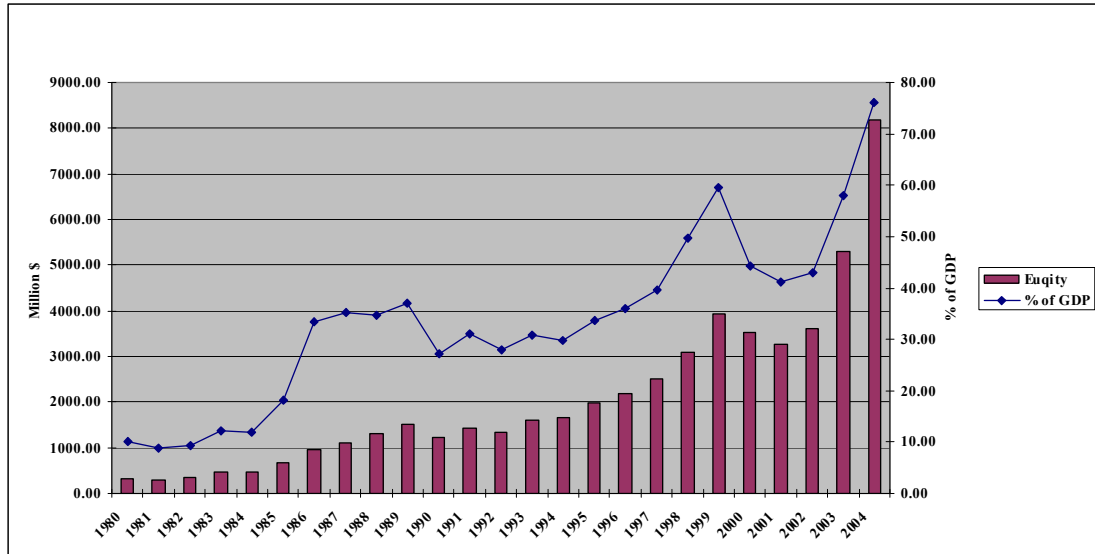
Figure 4.2: Bahrain's debt assets
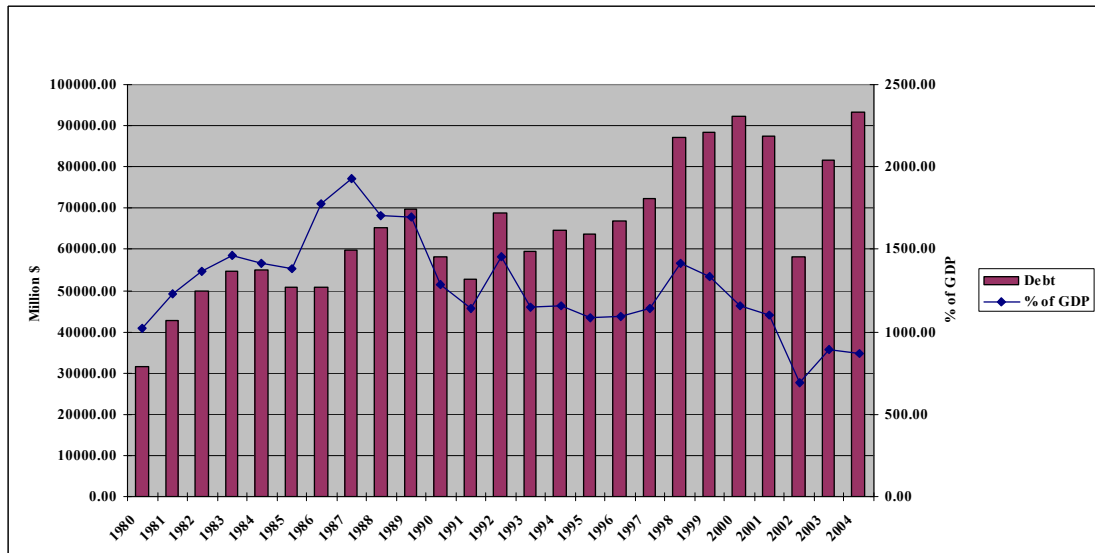
Figure 4.3: Bahrain's FDI assets
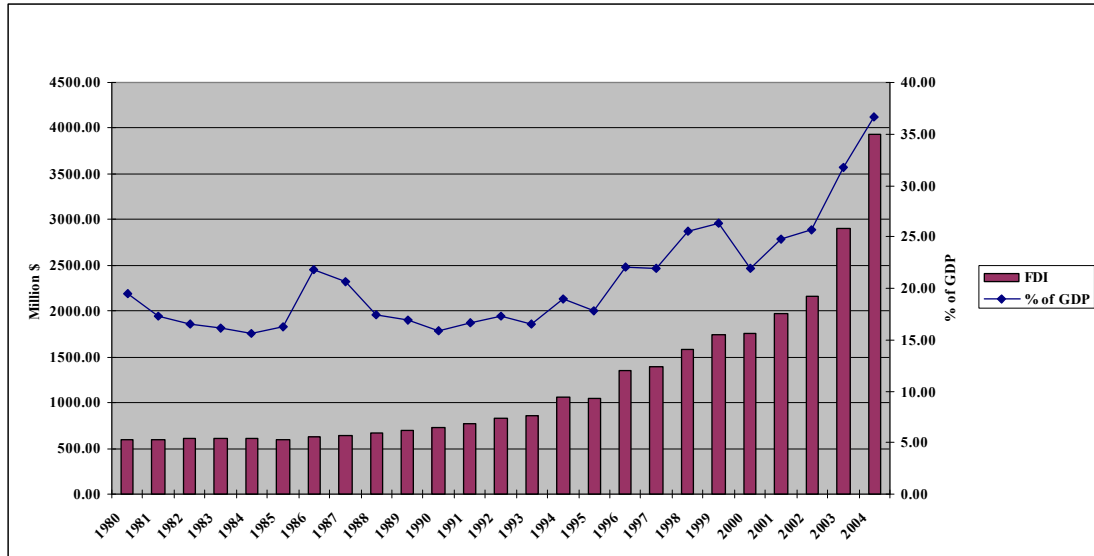
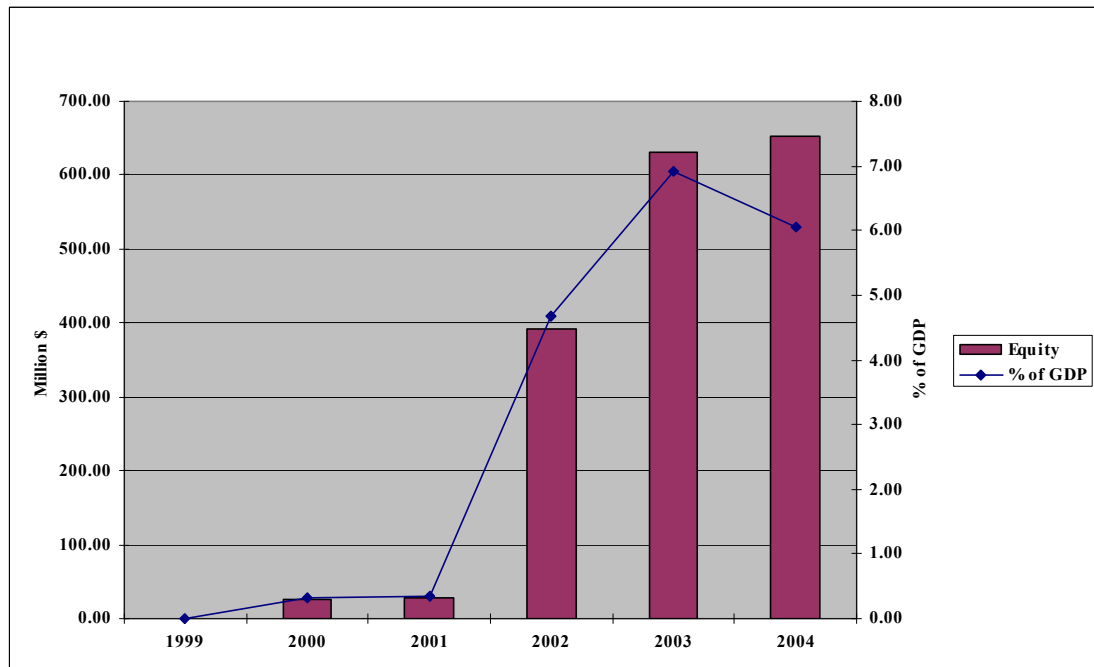

Figure 4.4: Bahrain's equity liabilities

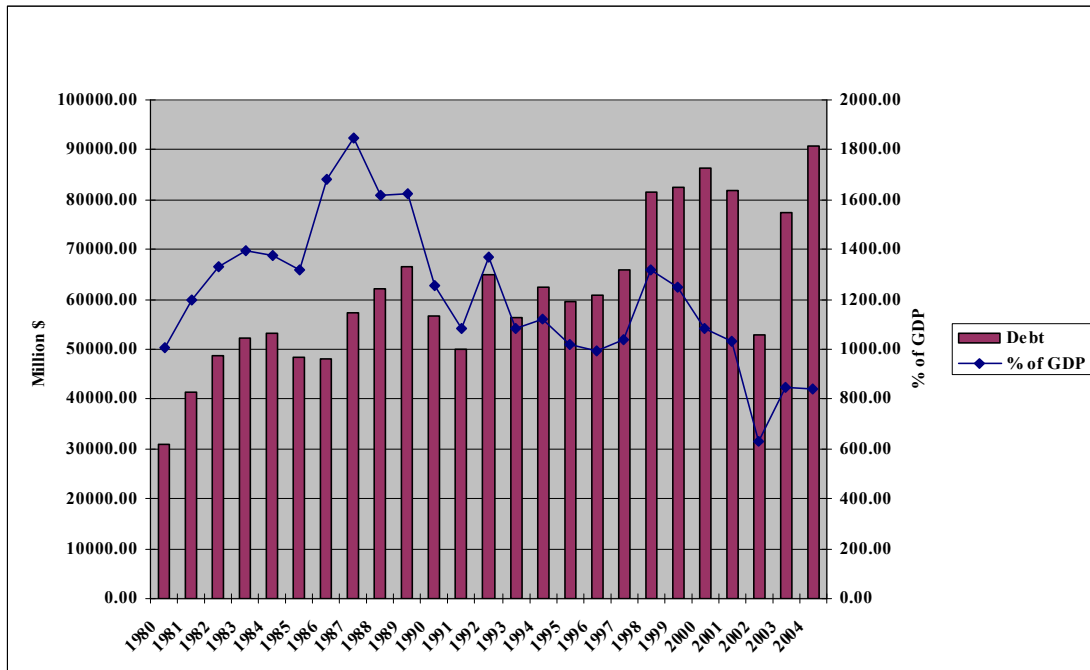Figure 4.5: Bahrain's debt liabilities

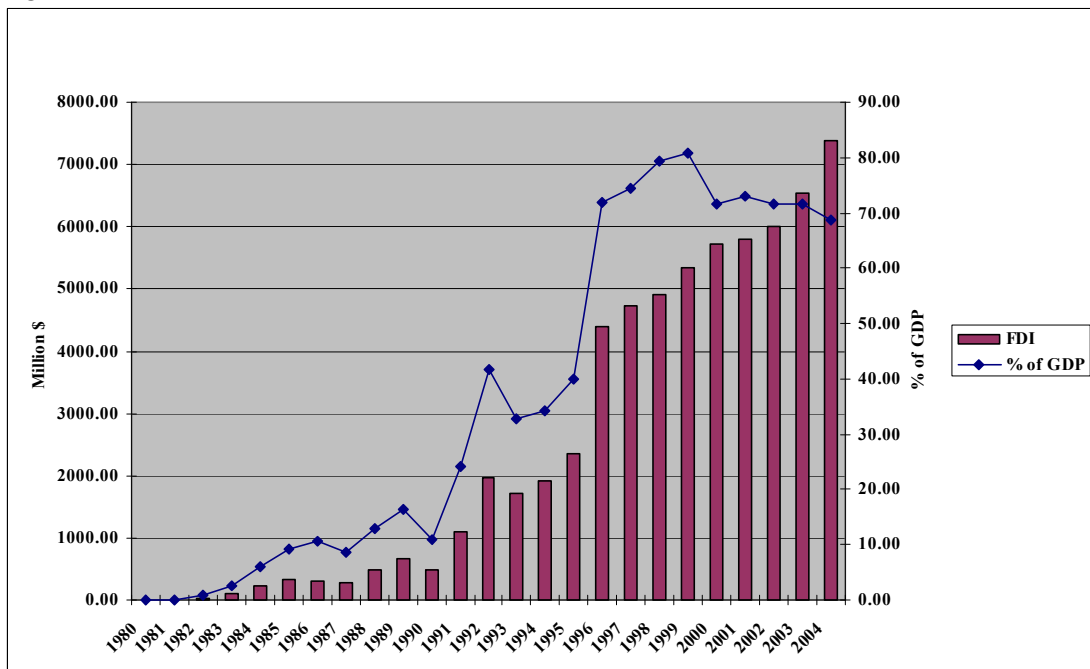Figure 4.6: Bahrain's FDI liabilities
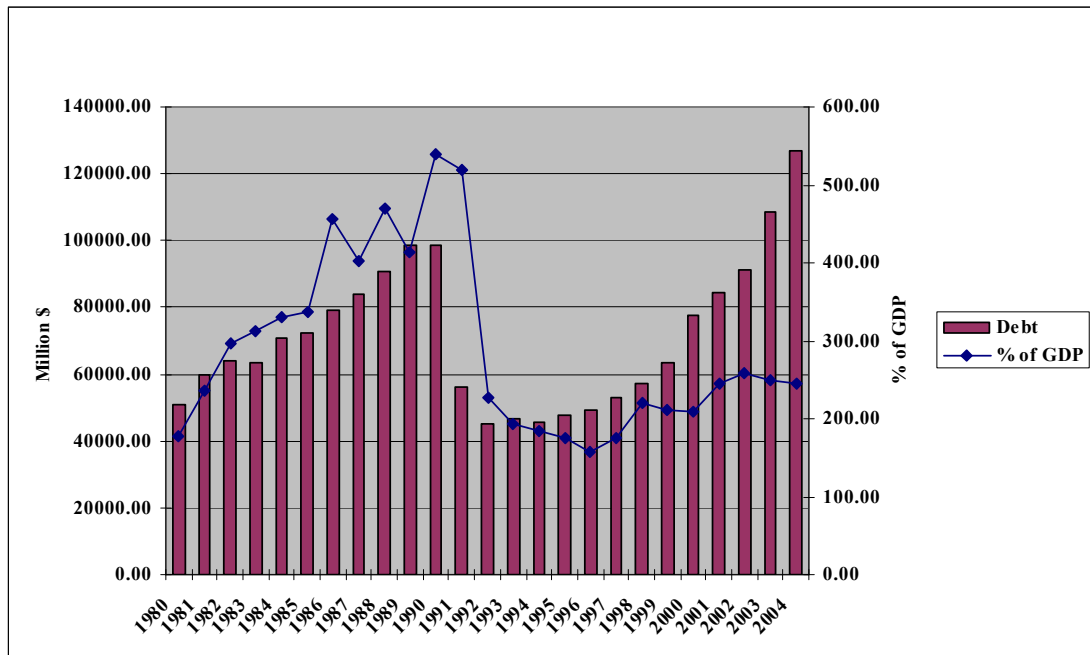
Figure 4.7: Kuwait' debt assets
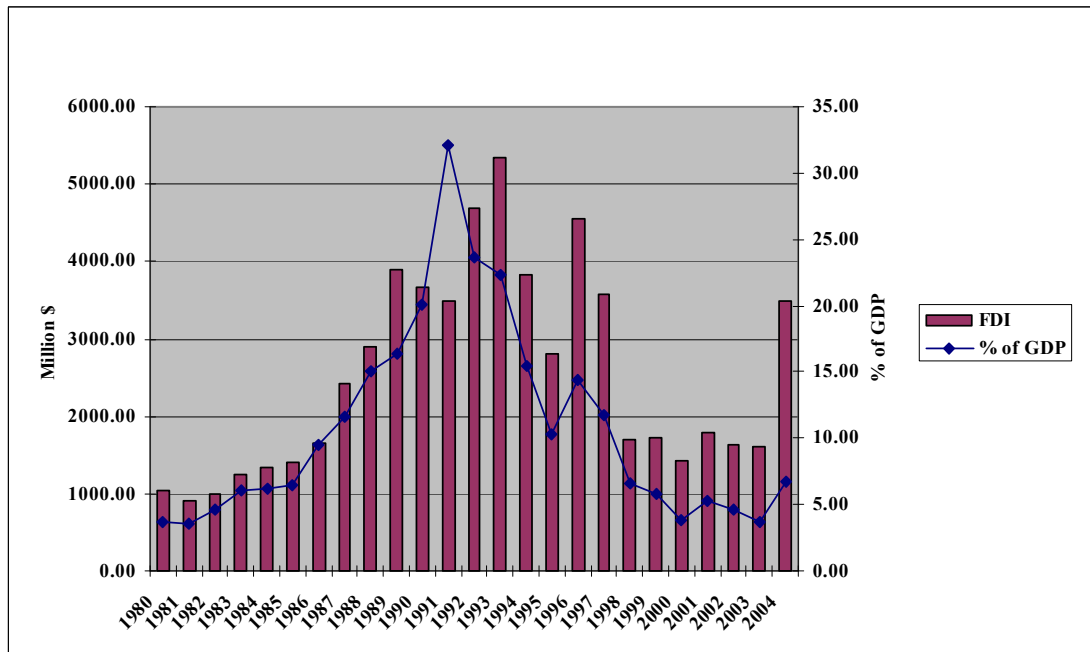

Figure 4.8: Kuwait's FDI assets
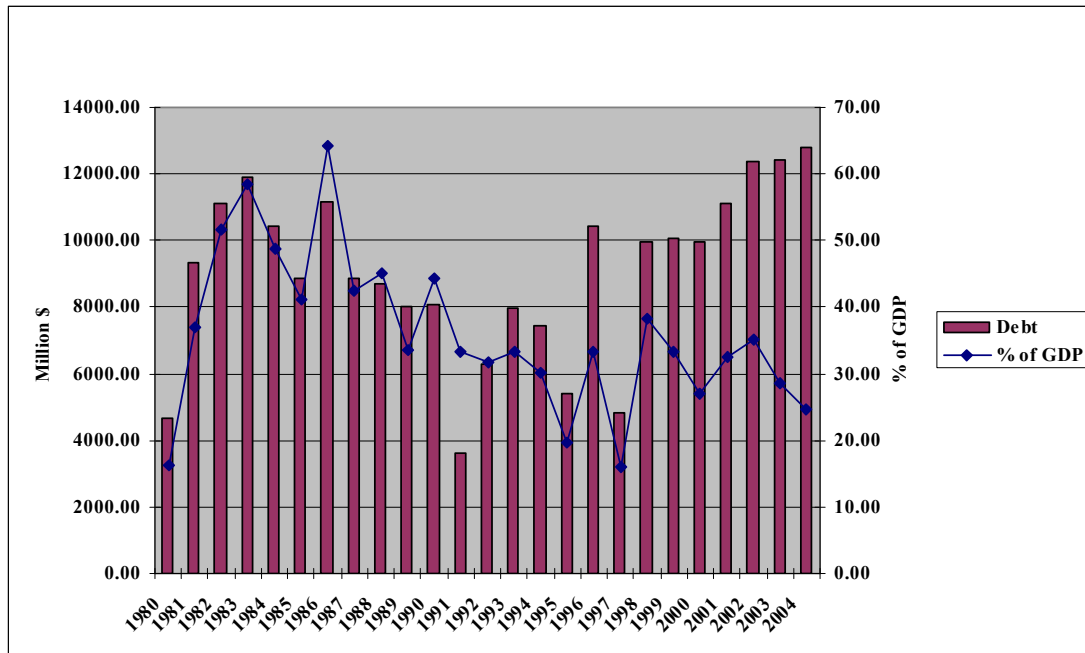
Figure 4.9: Kuwait's debt liabilities

Figure 4.10: Kuwait's FDI liabilities
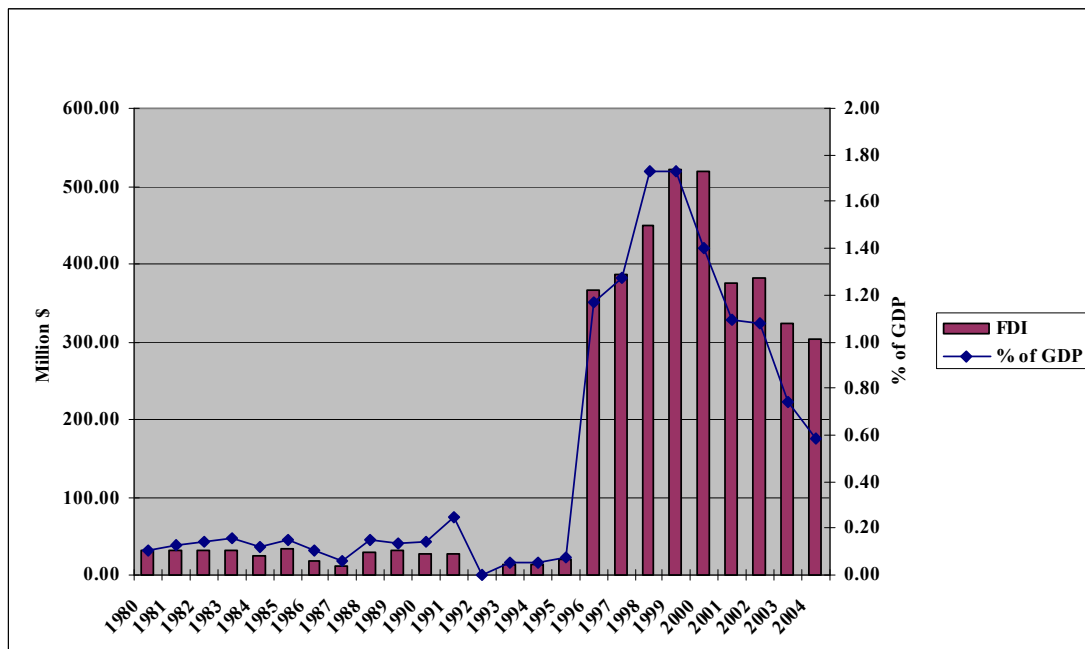
Figure 4.11: Oman debt assets
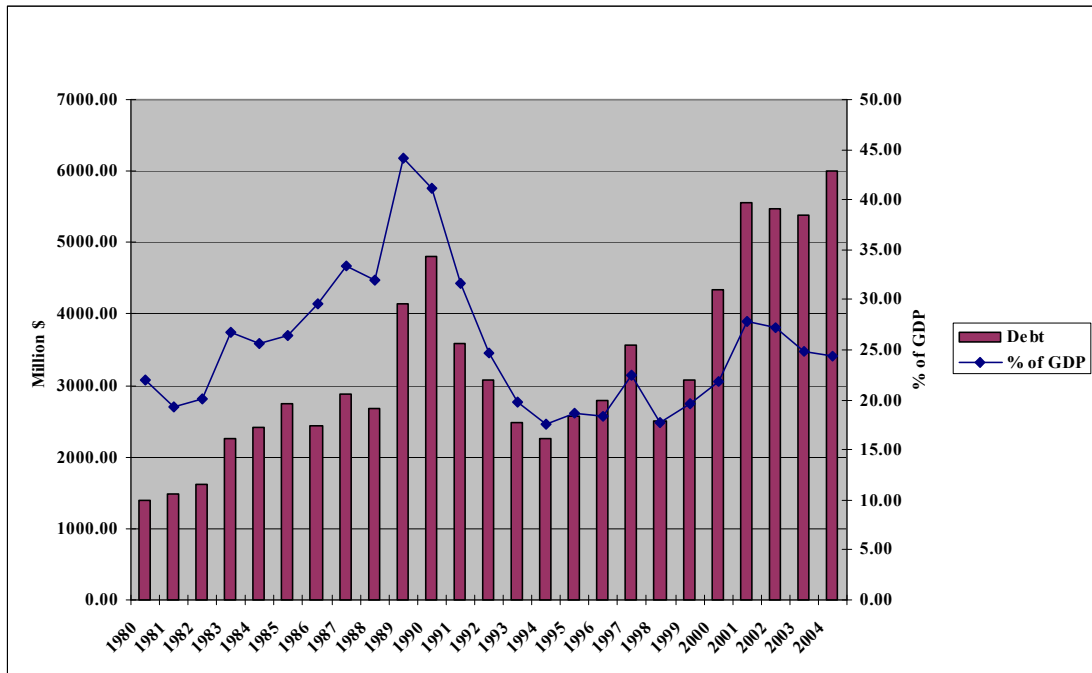
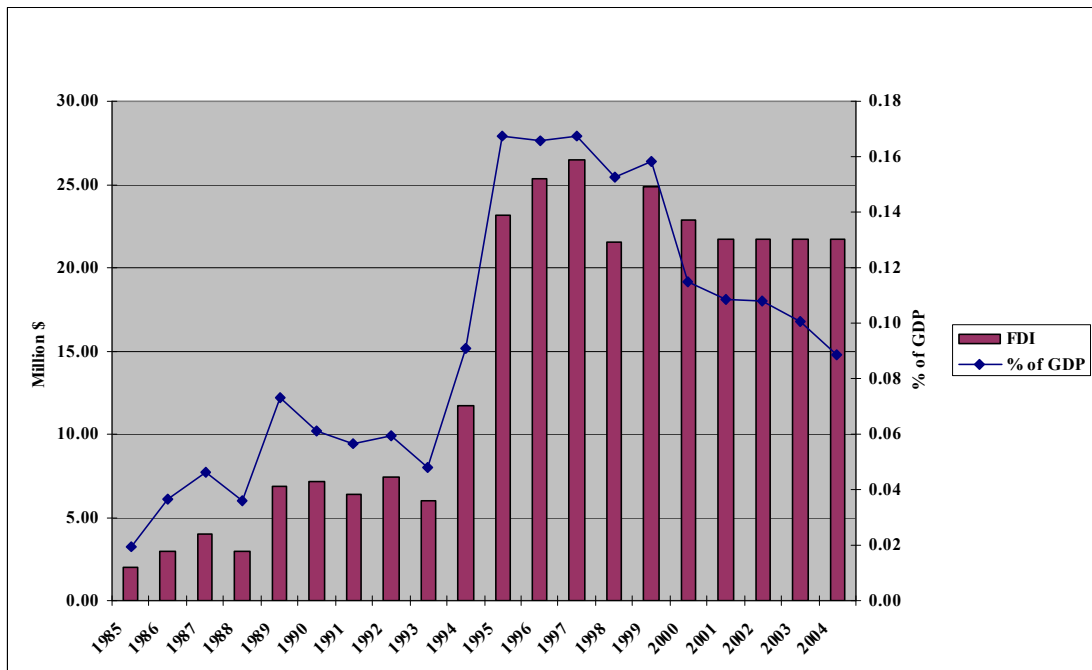
Figure 4.12: Oman's FDI assets

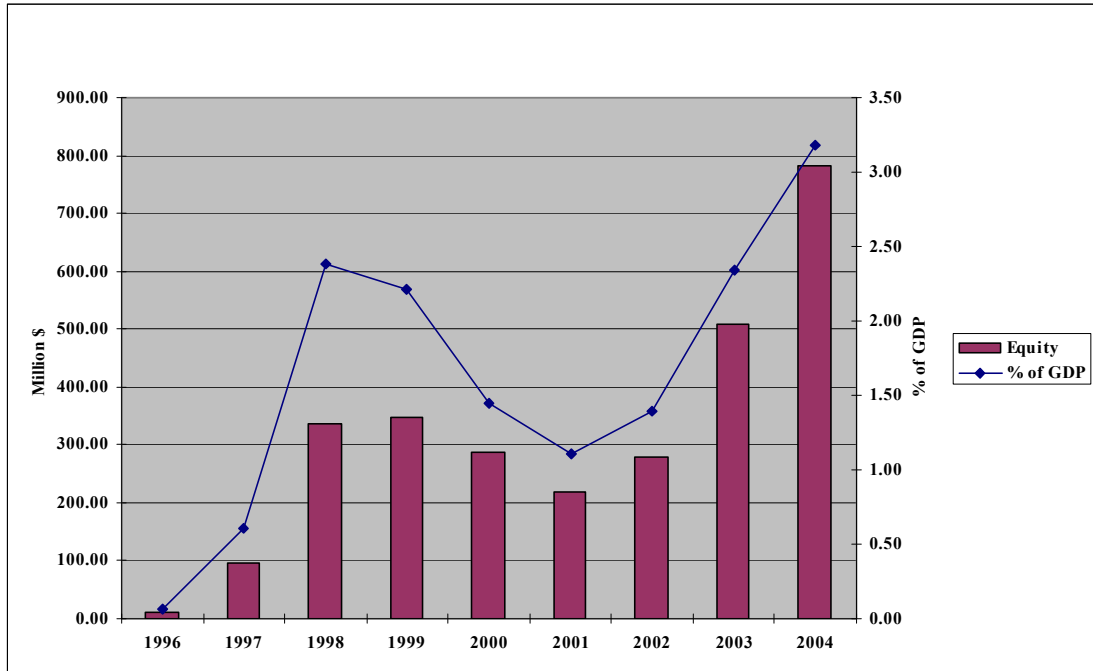Figure 4.13: Oman's equity liabilities

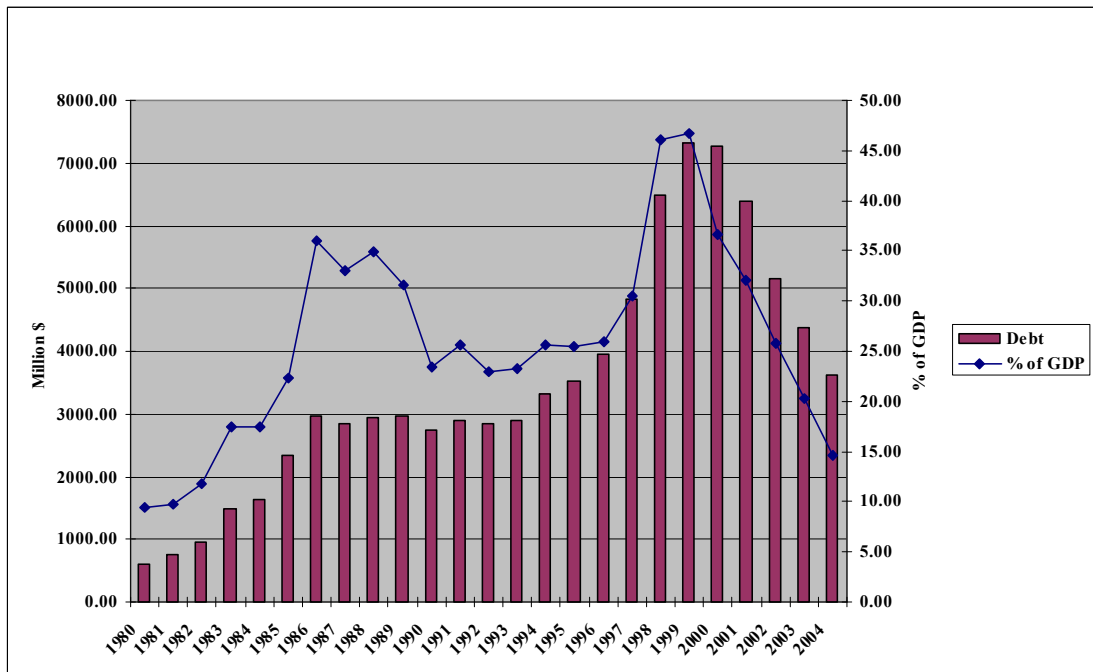Figure 4.14: Oman's debt liabilities

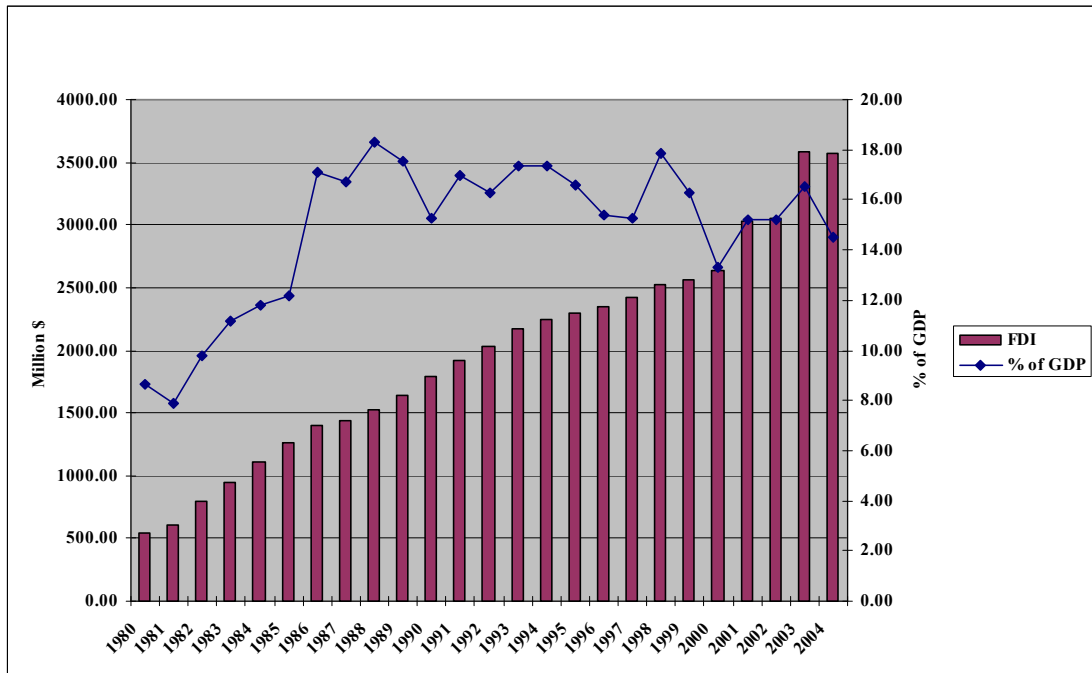Figure 4.15: Oman's FDI liabilities

Figure 4.16: Qatar's debt assets

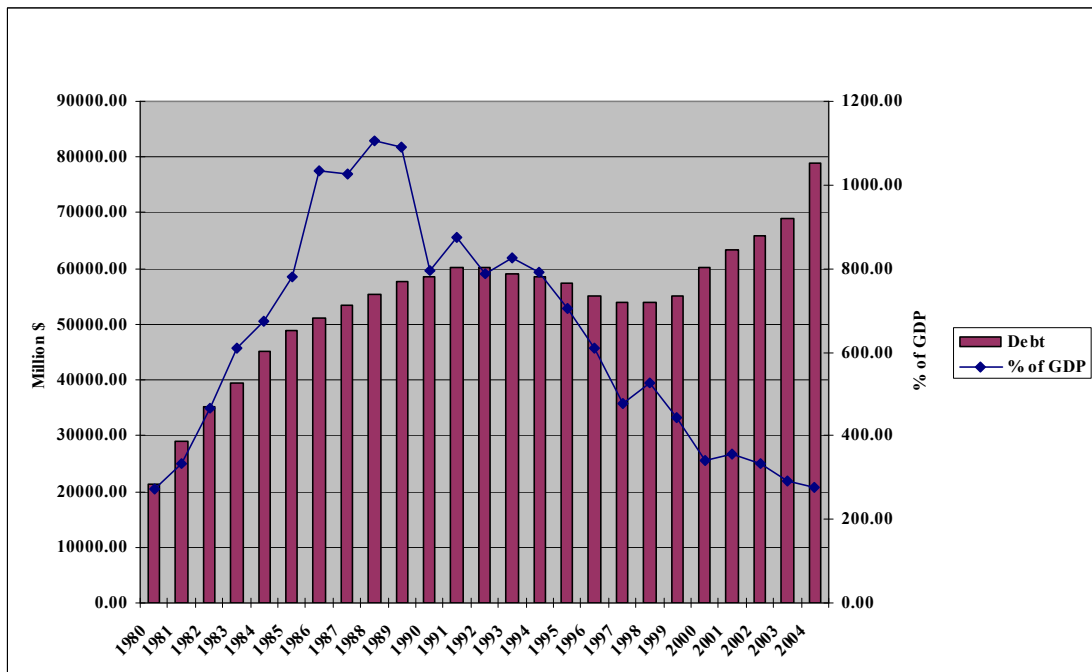Figure 4.17: Qatar's FDI assets
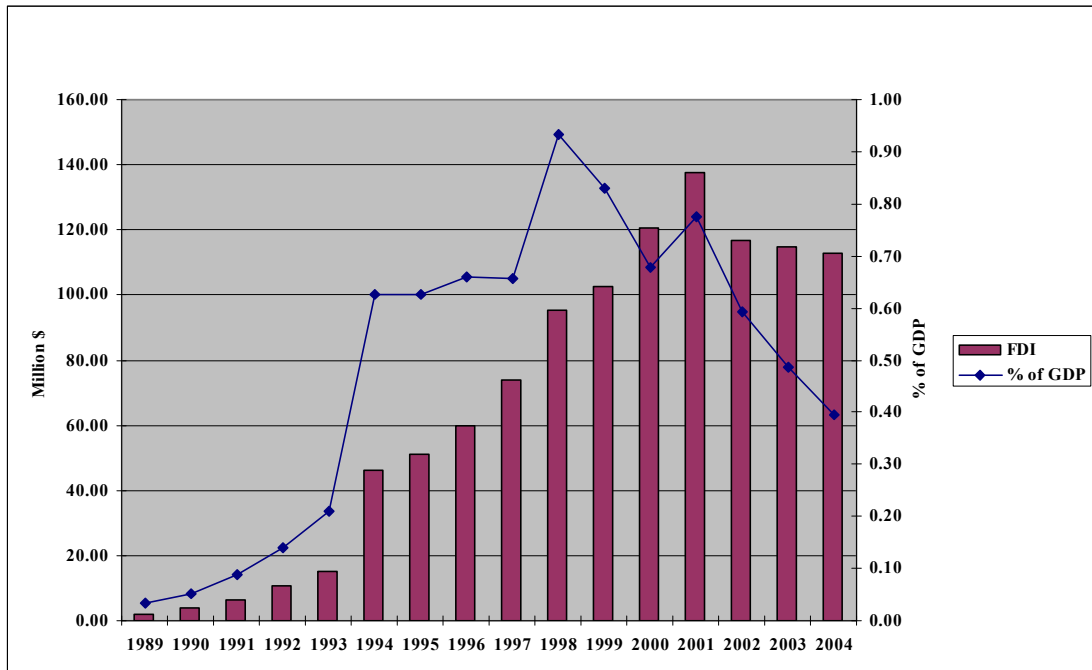
Figure 4.18: Qatar's debt liabilities
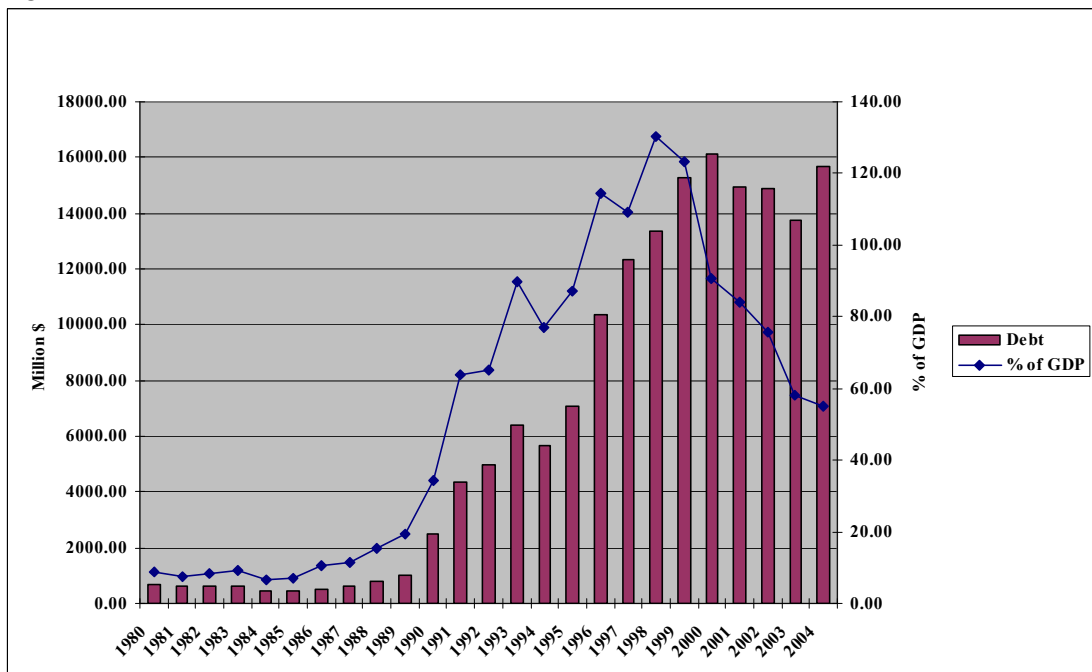
Figure 4.19: Qatar FDI liabilities
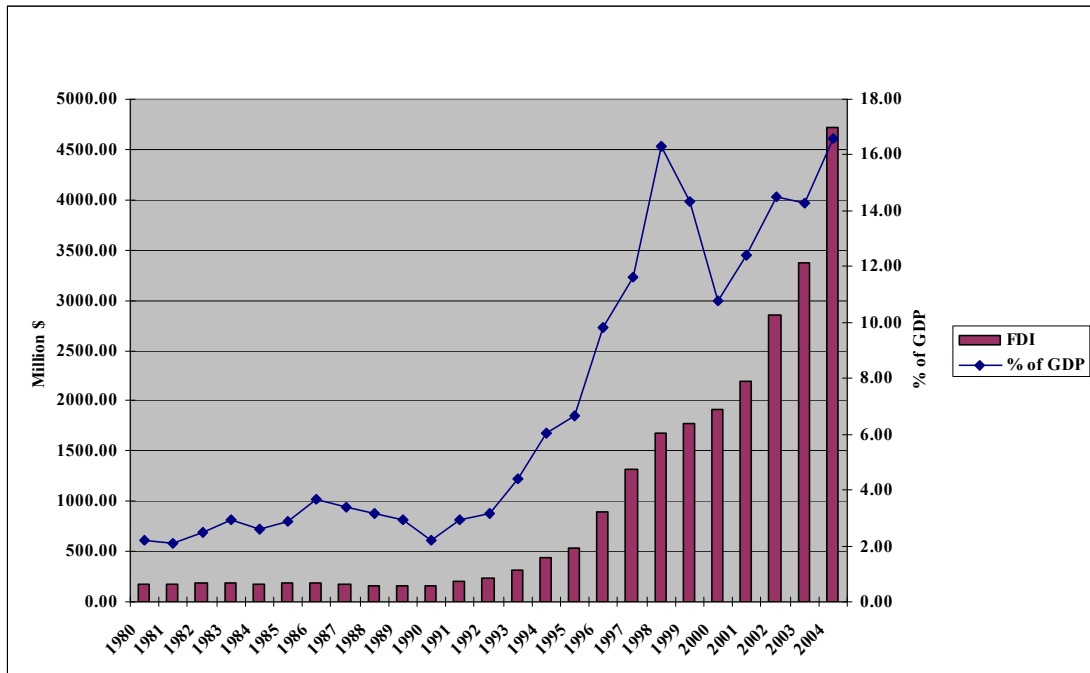
Figure 4.20: Saudi Arabia's equity assets
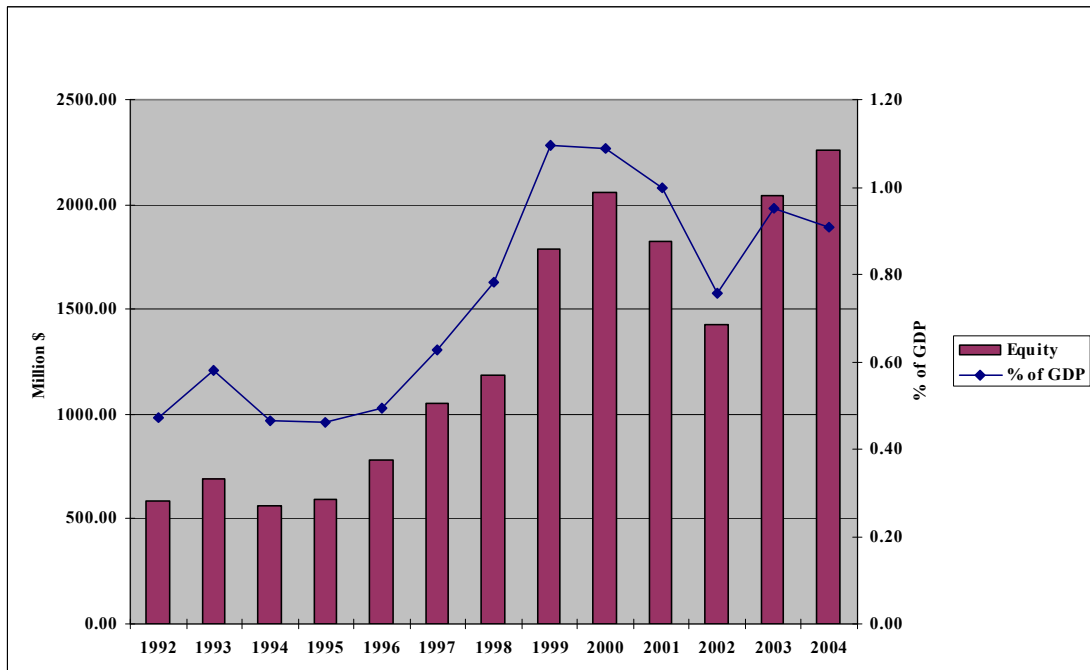
Figure 4.21: Saudi Arabia's debt assets
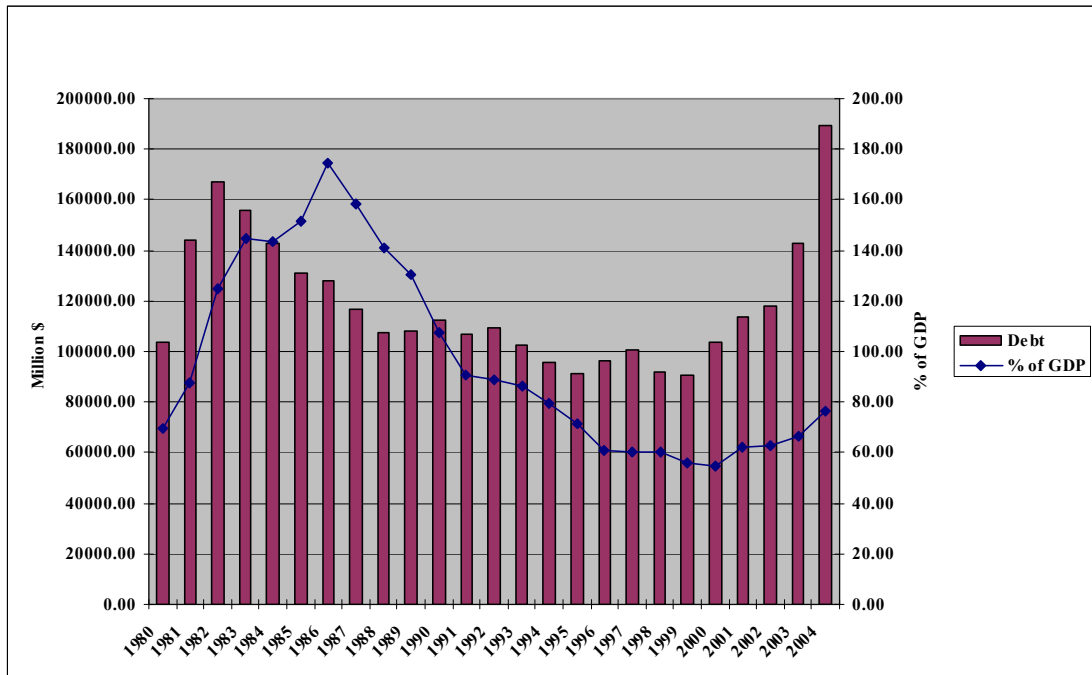
Figure 4.22: Saudi Arabia's FDI assets
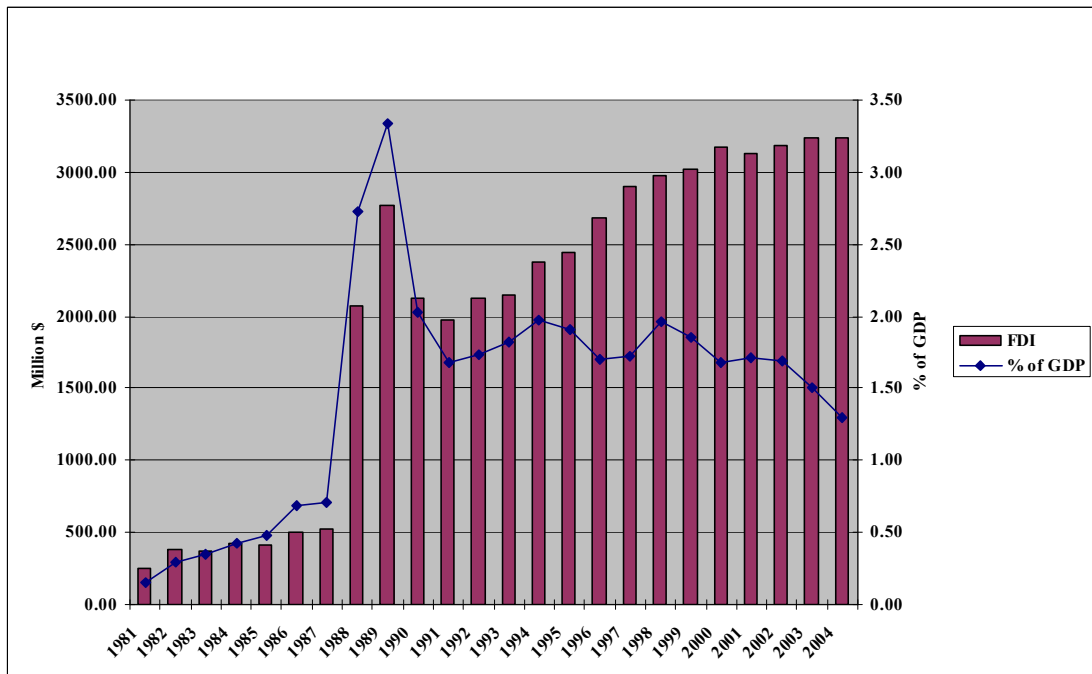
Figure 4.23: Saudi Arabia's debt liabilities
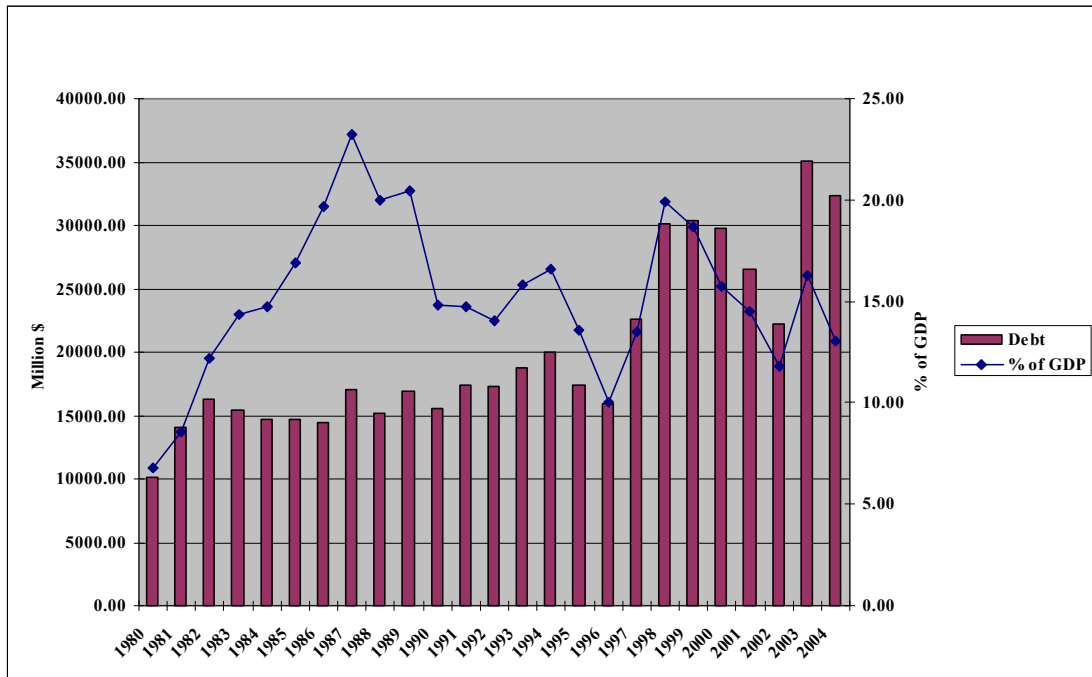
Figure 40.24: Saudi Arabia's FDI liabilities
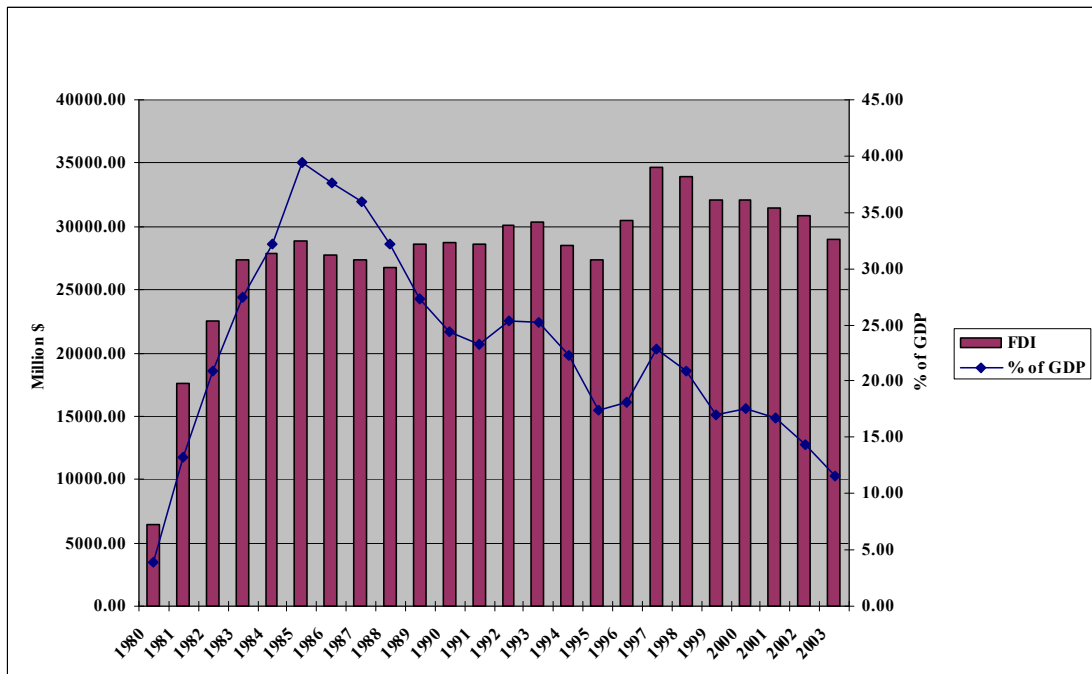
Figure 4.25: UAE's equity assets
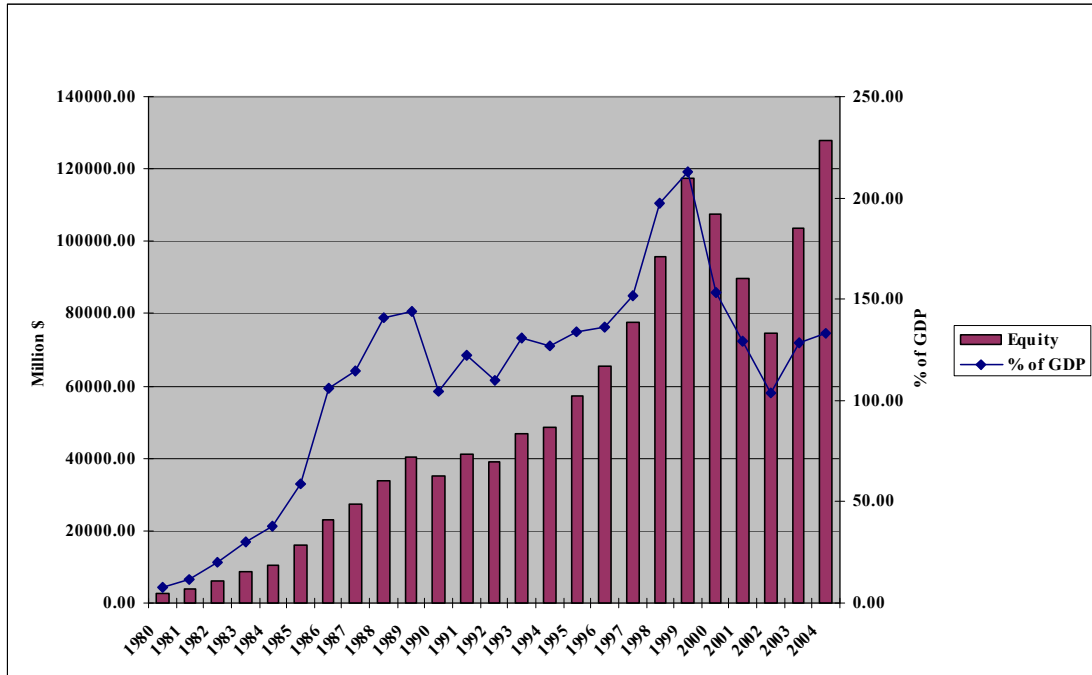
Figure 4.26: UAE's debt assets
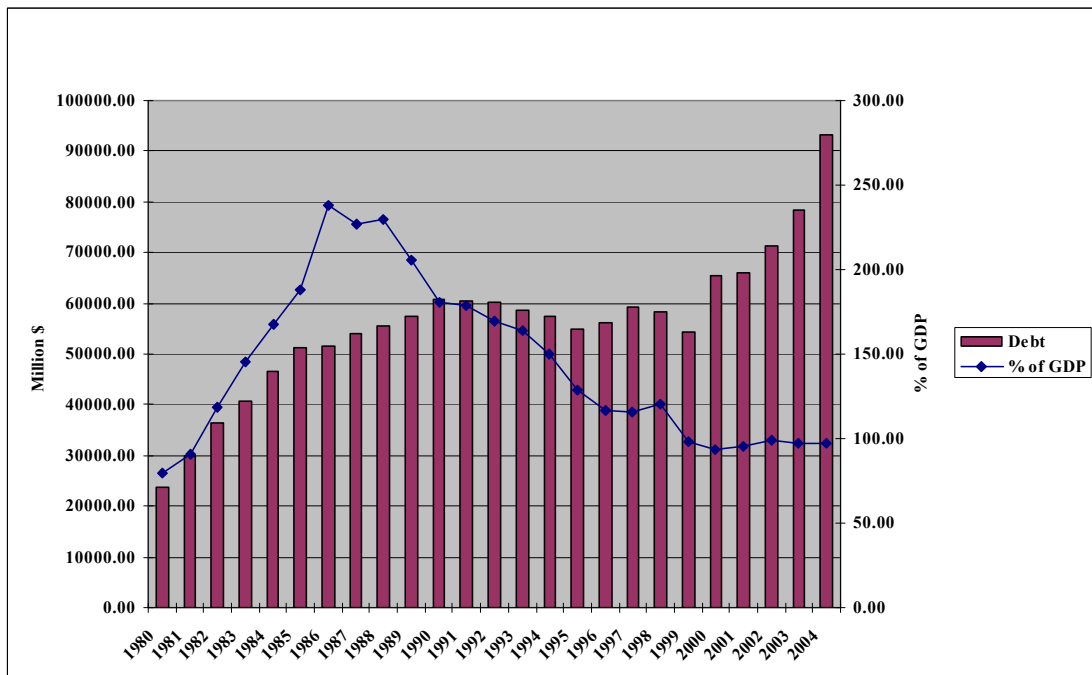
Figure 4.27: UAE's FDI assets
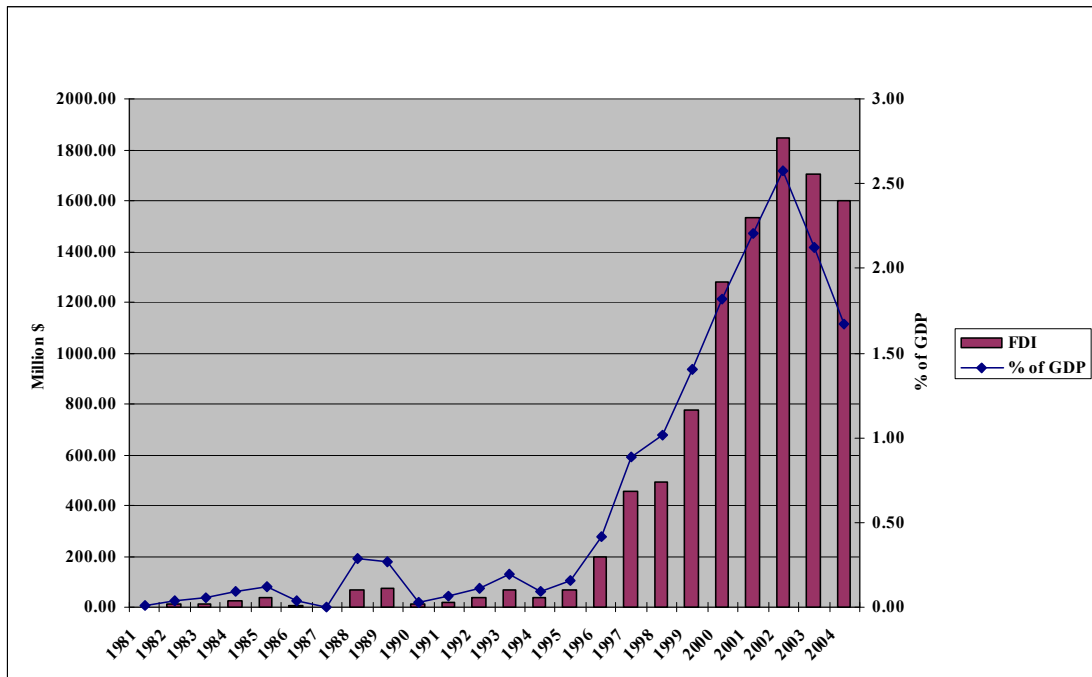
Figure 4.28: UAE's equity liabilities
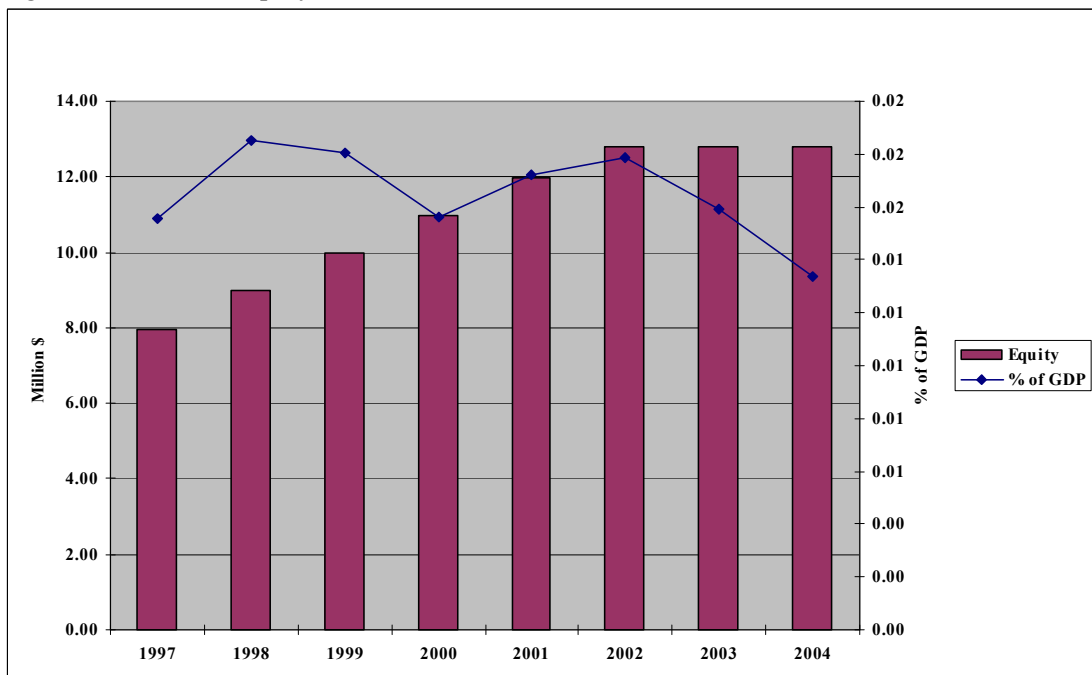
Figure 4.29: UAE's debt liabilities
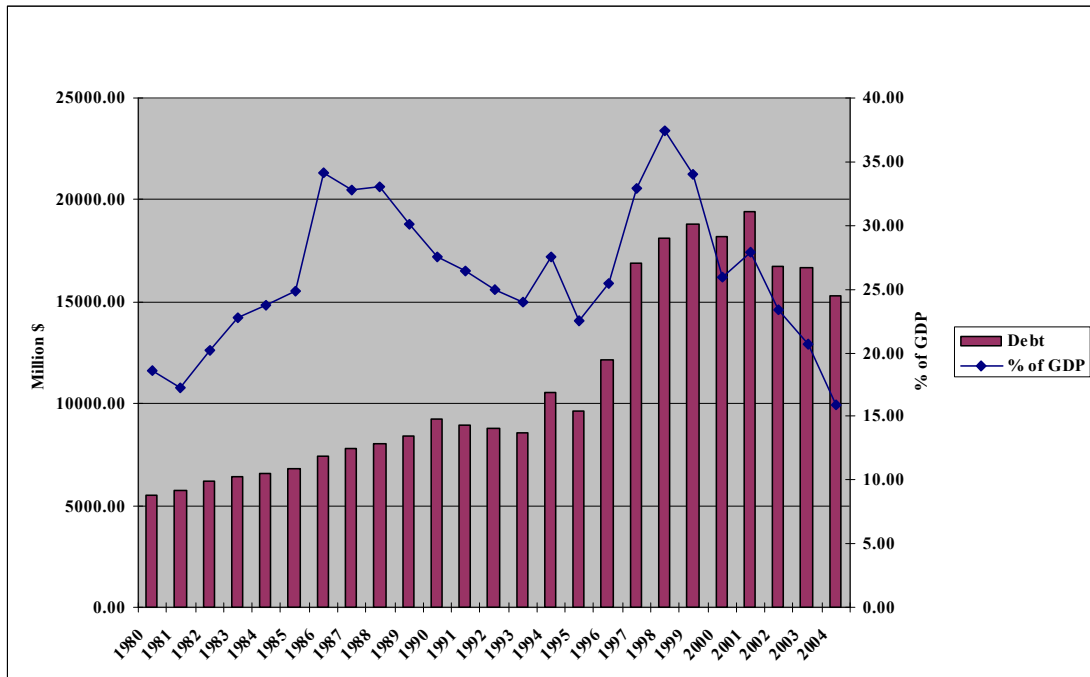
Figure 4.30: UAE's FDI liabilities
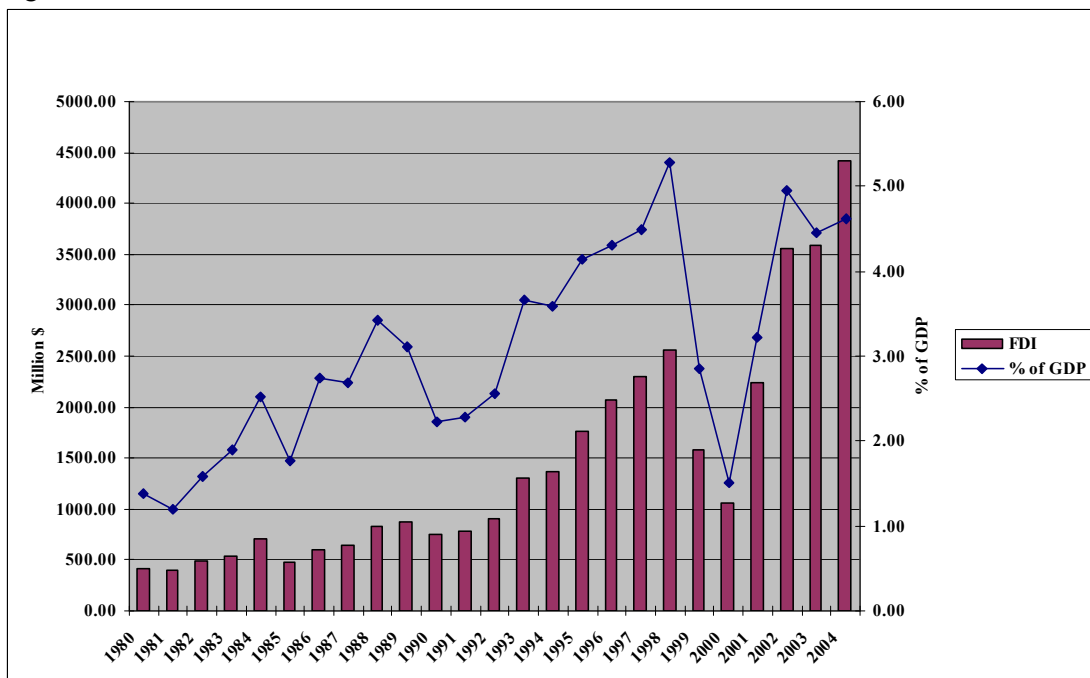
Figure 4.31: Bahrain Net International Investment Position by type of investment
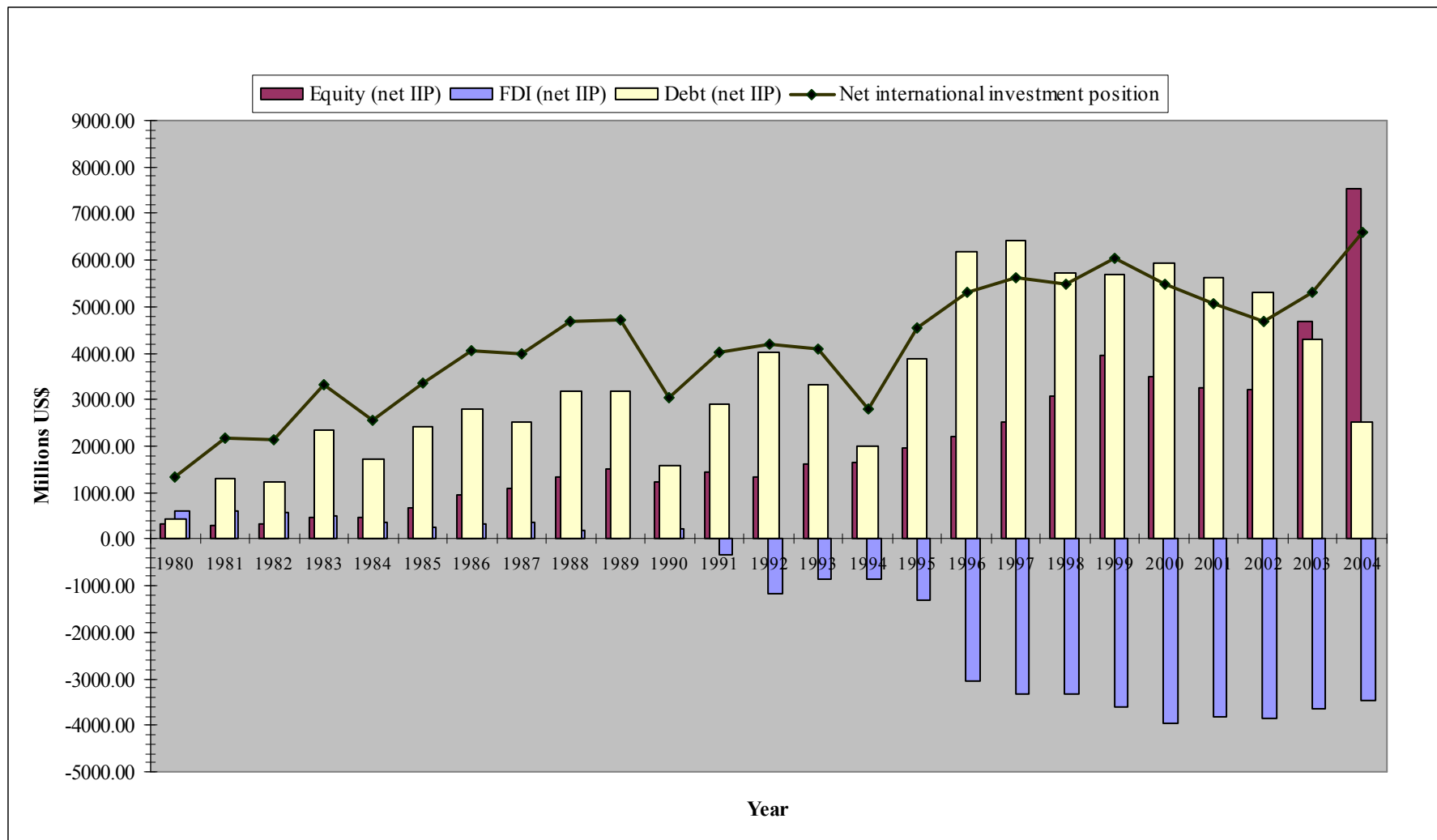
Figure 4.32: Kuwait Net International Investment Position by type of investment
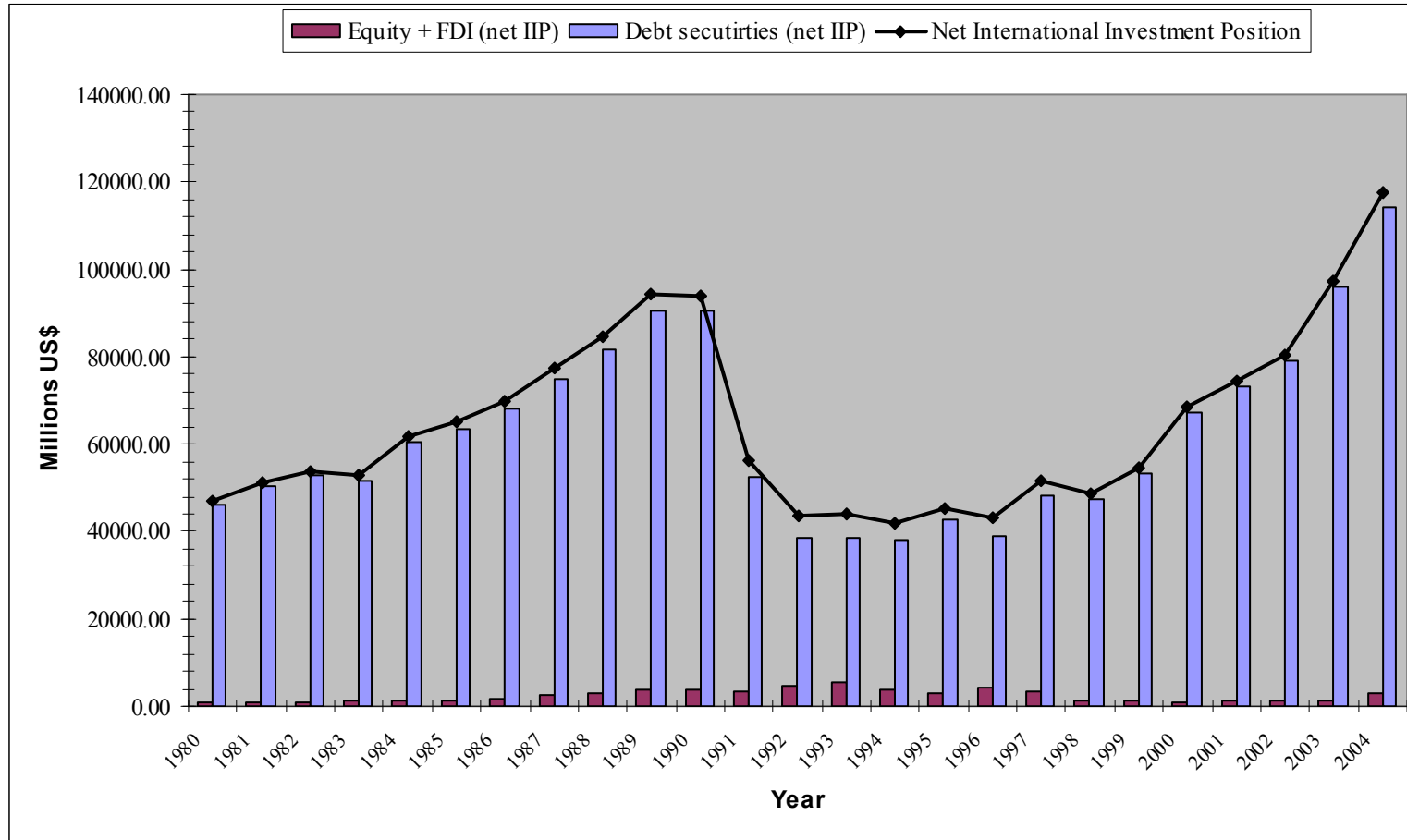
Figure 4.33: Oman Net International Investment Position by type of investment
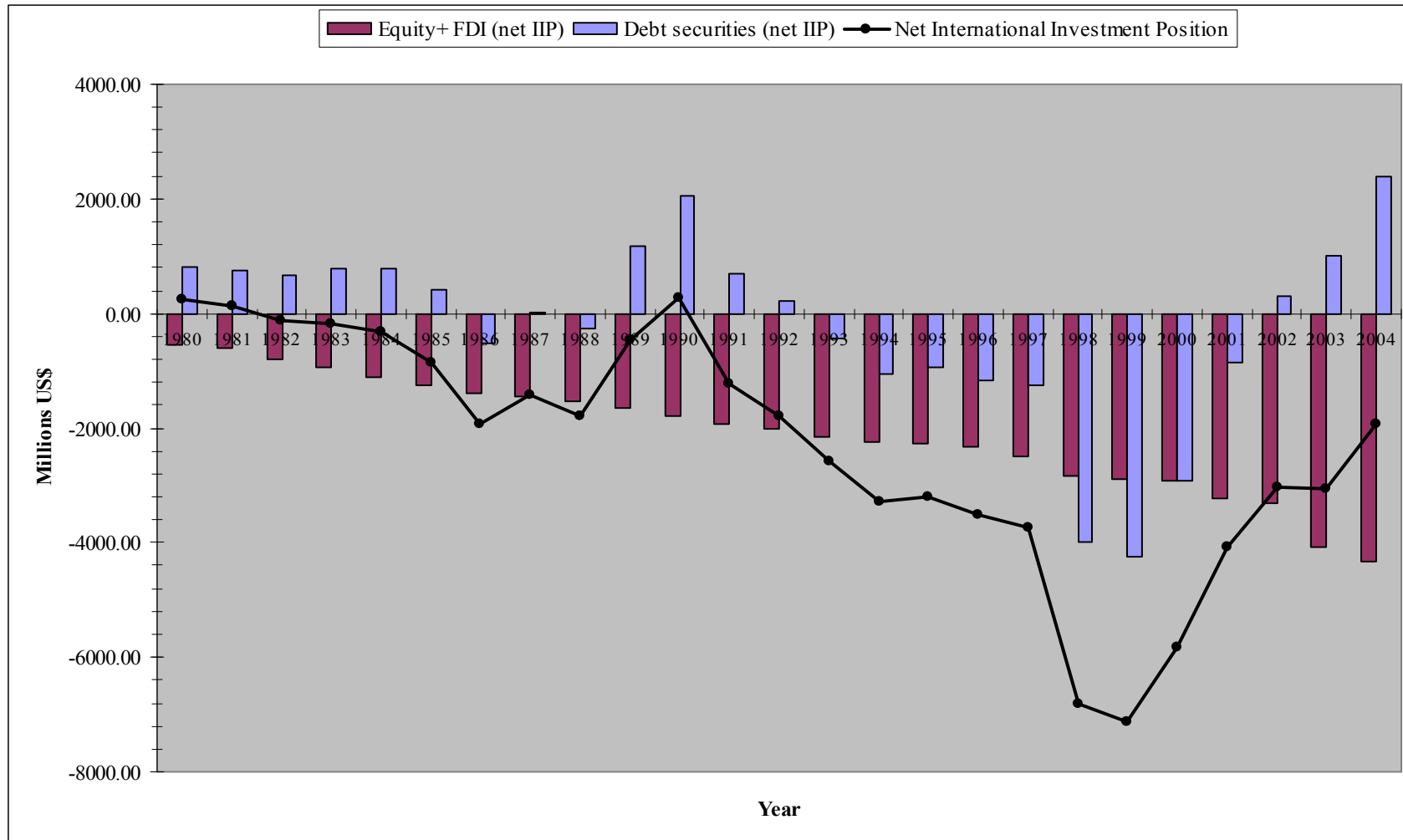
Figure 4.34: Qatar Net International Investment Position by type of investment
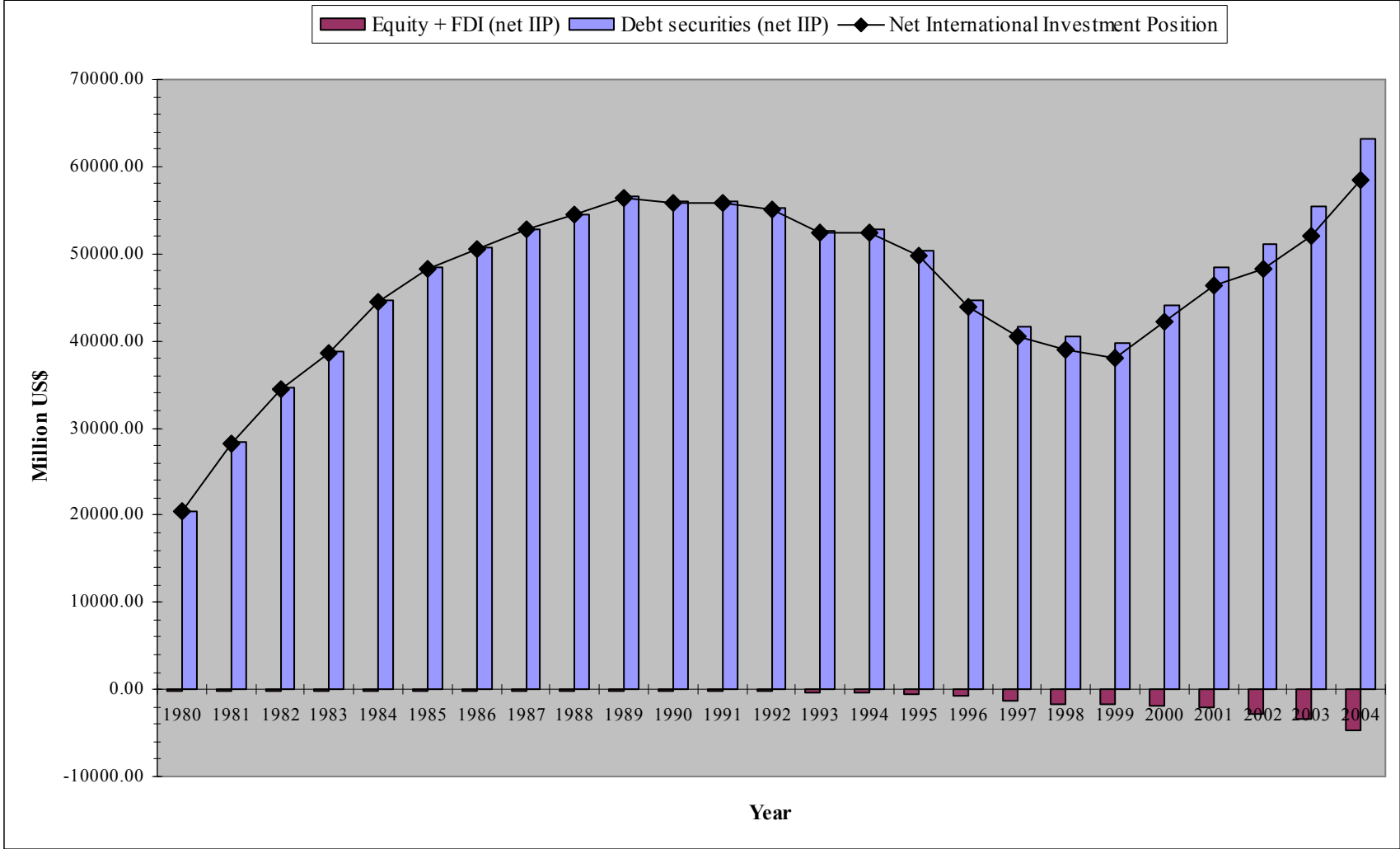
Figure 4.35: Saudi Arabia Net International Investment Position by type of investment
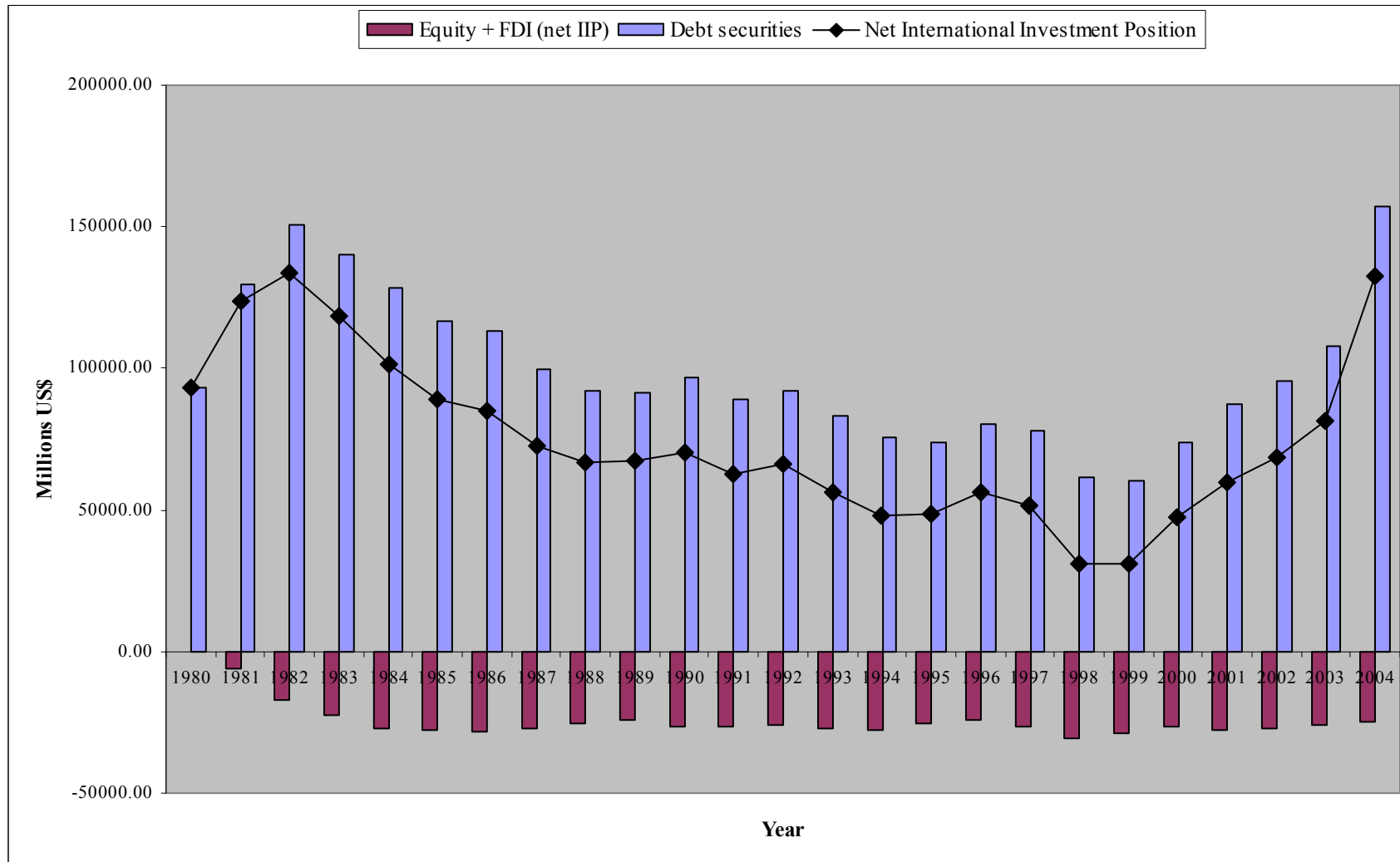
Figure 4.36: UAE Net International Investment Position by type of investment
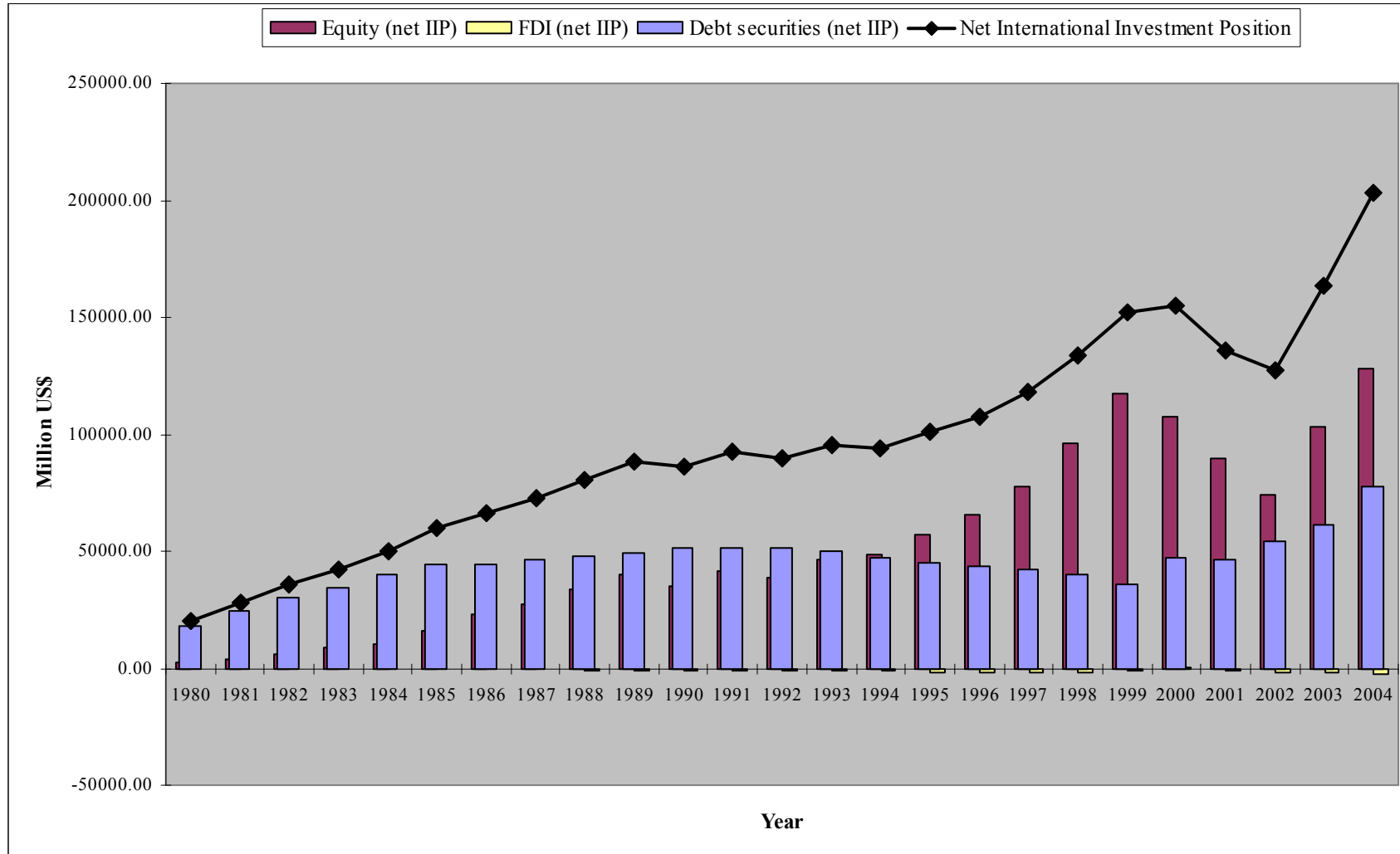
Figure 4.37: Equity Home Bias
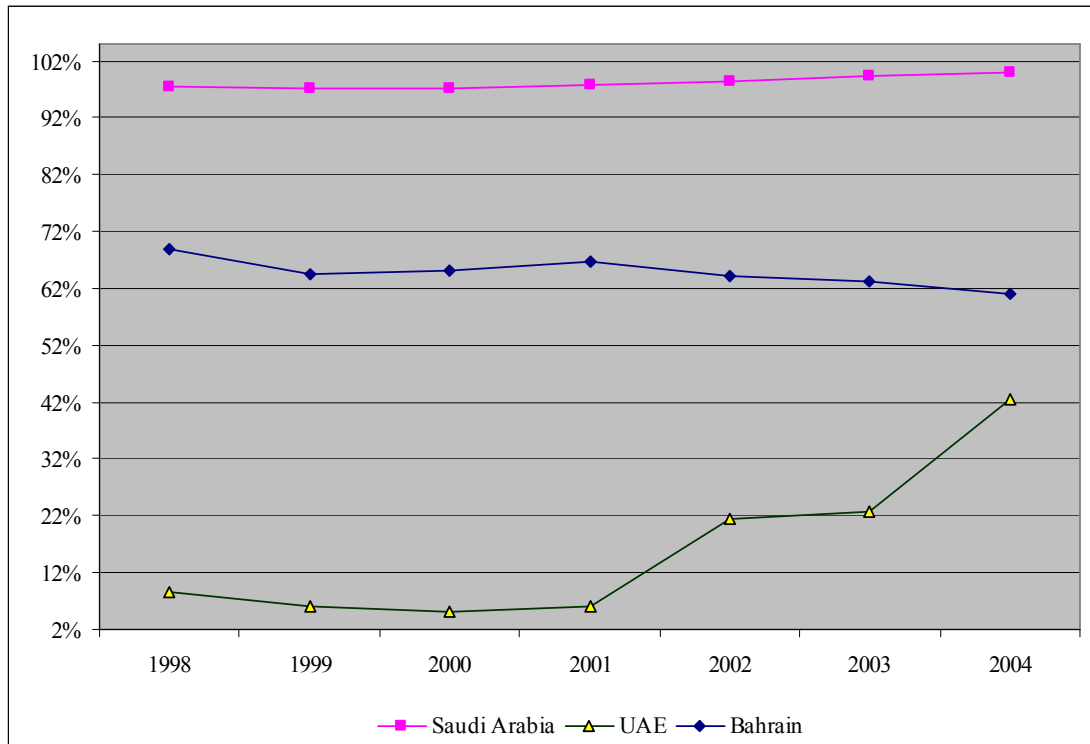
Appendix 4.A

Decomposing the cross-sectional variance of shocks to GDP

The methodology of Asdrubali *et al.* (1996) is based on decomposing cross-sectional variance in income within a group of countries. The idea is to break cross-sectional consumption smoothing into several levels. Smoothing by a group of countries can be provided via cross ownership of productive assets that insure against asymmetric output shocks, and lending and borrowing through credit markets. In this paper, the following identity is considered, for any period t,

$$GDP^i = \frac{GDP^i}{GNI^i} \frac{GNI^i}{Cons^i} \ Cons^i,$$

where GDP^i, GNI^i and $Cons^i$ represent Gross Domestic Product, Gross National Income and Consumption for country i and are in per capita terms. By taking log and difference on both sides of the above identity, and multiplying by ΔGDP^i (minus its mean), taking the expectation, the following variance decomposition is obtained:

$$\begin{aligned}
Var\left(\Delta LogGDP^i\right) = & \ Cov\left(\Delta LogGDP^i - \Delta LogGNI^i, \Delta LogGDP^i\right) \\
& + Cov\left(\Delta LogGNI^i - \Delta LogCons^i, \Delta LogGDP^i\right) \\
& + Cov\left(\Delta LogCons^i, \Delta LogGDP^i\right)
\end{aligned}$$

Dividing by variance of ΔGDP^i, the following equation is obtained:

$$1 = \beta_F + \beta_C + \beta_U,$$

where $\beta_F = \dfrac{Cov\left(\Delta LogGDP^i - \Delta LogGNI^i, \Delta LogGDP^i\right)}{Var\left(\Delta LogGDP^i\right)}$

$$\beta_C = \frac{Cov\left(\Delta LogGNI^i - \Delta LogCons^i, \Delta LogGDP^i\right)}{Var\left(\Delta LogGDP^i\right)}$$

and $\beta_U = \dfrac{Cov\left(\Delta LogCons^i, \Delta LogGDP^i\right)}{Var\left(\Delta LogGDP^i\right)}$.

Where β_F and β_C are interpreted as the incremental percentage amount of smoothing achieved at each level. β_U is interpreted as the fraction of shocks to output that is not smoothed.

At the practical level, their panel regression takes the following form:

$$\Delta Log\, GDP_{it} - \Delta Log\, GNI_{it} = \nu_{K,t} + \beta_F\, \Delta\, Log\, GDP_{i,t} + \varepsilon^i_{K,t}$$

$$\Delta Log\, GNI_{it} - \Delta Log\, Cons_{it} = \nu_{C,t} + \beta_C\, \Delta\, LogGDP_{i,t} + \varepsilon^i_{C,t}$$

$$\Delta Log\, Cons_{it} = \nu_{U,t} + \beta_U\, \Delta\, Log\, GDP_{i,t} + \varepsilon^i_{U,t}$$

where t represents time. In case of full risk sharing, $Cov\!\left(\Delta LogCons^i, \Delta LogGDP^i\right)$ or β_U would be 0 and the coefficients on β_F and β_C would sum to 1. If a full risk sharing is attained thorough capital market, income in each country should not co-move with its GDP, where $Cov\!\left(\Delta LogGNI^i, \Delta LogGDP^i\right)$ would be zero, implying $Cov\!\left(\Delta LogGDP^i - \Delta LogGNI^i, \Delta LogGDP^i\right) = Var\!\left(\Delta LogGDP^i\right)$ and $\beta_F = 1$.

If full risk sharing is not attained through this channel, then there is more potential for risk sharing through credit markets. In case risk sharing is fully smoothed after all the channels, consumption will not co-move with GDP for a given level of aggregate output, which imply $\beta_U = 0$ and $\beta_F + \beta_C = 1$

Athanasoulis and van Wincoop (2000) and Sørensen et al.(2007) argue about the importance of subtracting the aggregate GDP growth rate because the aggregate growth rate of the group is not insurable. Therefore, $\Delta GDP_{i,t}$ on the right hand side will be defined as $\Delta \log GDP_{i,t} = \Delta \log GDP_{i,t} - \log \Delta GDP_{G,t}$, where $\Delta \log GDP_{G,t}$ is the log difference of the Group's GDP.

Given the wide literature based on the assumptions of Asdrubali *et al.,* the method is limited in some aspects. Asdrubali and Kim (2004) argue that the model and much of the literature following it do not give answers to important questions. For instance, what kinds of shocks have the largest impact on consumption? How long does it take for a given shock to be absorbed? What is the dynamic role of the risk sharing channels and what is the relationship among them? In their analysis, Asdrubali and Kim (2004) attempt to overcome these limitations by applying a dynamic and simultaneous model to generalize the stochastic processes of the relevant variables. They performed the analysis using a structural panel VAR model to analyse the risk- sharing channels among the U.S. and OECD countries. Capital and credit markets are found to be the major channels of risk sharing among the U.S., while credit markets pertain for the OECD countries.

Appendix 4.B

Table 4.B.1: Real GDP growth rate

Year	2005	2006	2007	2008*
Bahrain	7.9	6.7	8.1	6.1
Kuwait	10.6	5.1	2.5	6.3
Oman	4.9	6.0	7.7	7.8
Qatar	9.2	15.0	15.3	16.4
UAE	8.2	9.4	6.3	7.4

Source: World Economic Outlook.
*IMF estimates

5   Conclusion

The launch of the Euro in 1999 has renewed interest in the monetary union among the GCC countries. Fostering the integration process in the GCC with the goal of having a common currency will help to maximize the economic gains from the regional integration, and lead to further and more effective economic diversification. The proposed common currency by 2010 is expected to obtain more durable commitment and eliminate any exchange rate fluctuations among members and the transaction costs associated with them, thus helping to increase trade and investment among GCC countries.

This dissertation explores three topics relevant to the regional economic integration among the GCC countries. The first essay has addressed the effect of GCC formation on intra-regional trade, non-oil trade in particular, as little is known about the scope for increased non-oil trade within the GCC. The gravity model of bilateral trade has been applied to a set of panel data for the period 1980-2004 to explain patterns of trade, and the possible existence of trade creation between members. Despite the GCC membership that is expected to promote intra-trade, the results show that GCC members tend to trade about 54 percent less among themselves than with non-GCC trading partners. This might suggest that the GCC countries had ineffective trading agreements during the study period.

One of the main arguments explaining the GCC trade patterns is the low level of economic diversification from oil and gas production. A higher share of oil and gas, and oil exports has shown an association with lower non-oil exports. Furthermore, higher differences in terms of factor endowments are showing a potential association with higher trade among the GCC countries. In addition, the GCC members usually produce similar products, and therefore compete with each other. The GCC members are considered open economies in terms of trade; therefore they face competition from global products that are based on comparative advantage and economies of scale. Lack of commitment among members to follow the timeframe of the customs union and common market might have contributed to the lower volume of trade within the GCC.

The second essay has investigated the determinants of business cycles synchronizations, focusing on the role of trade, specialization and financial openness. These factors were estimated using a system of simultaneous equations, allowing for the identification of their direct as well as indirect impact. Trade has shown to be a major channel for transmitting shocks across the GCC and their trading partners, but not within the GCC countries. Specialization patterns are found to be the main channel for determining the co-movement of the GCC countries' outputs, as well as being associated with higher bilateral trade. Financial openness has shown a tendency to promote higher correlation between the output of the GCC and their major trading patterns, but is shown to play an insignificant role within the GCC countries. An interesting finding is the prevalence of inter-industry over intra-industry trade in driving output synchronization, while higher trade is found to drive different patterns of specialization across countries. It would be an interesting empirical question to investigate which impact, higher trade or higher specialization, would dominate.

The last essay shows that less than 40 percent of the shocks to the GCC outputs are smoothed, where the saving channel is associated with a higher contribution than that of the net factor income. Investment portfolio diversification shows that a rising trend toward financial openness is accompanying lower co-movement between the GNI and output in recent years. However, it seems that these foreign holdings are still too small to expect a contribution to a significant smoothing. For instance, equity assets are absent and FDI is very small relative to GDP in most of the GCC portfolios. Debt components strongly dominate the group's portfolio, but the result shows a significant association of debt liabilities with lower smoothing. Such a result confirms the argument in the literature that transitory, but not permanent, shocks are smoothed via debt stocks.

The GCC countries are highly specialized in natural resources industries which makes their output more volatile than that of other regional countries. If such a trend of specialization is to continue, higher income and consumption smoothing will be required in order to hedge against risk to output. Mélitz and Zumer (1999) argue that the role of smoothing via the capital market should be larger for regions dominated by mineral industries, e.g. GCC countries, which tend to experience persistent shocks. Unless investment portfolio diversification is based on hedging

considerations and targeted toward markets that are asymmetric to the GCC output, it is not expected that these diversifications will provide significant insurance.

The GCC countries still have some way to go before reaching a fair level of income and consumption smoothing. While it is too early to draw a definitive conclusion about its impact, the completion of a monetary union among the GCC countries, with an expected impact on trade, labour mobility and greater transparency, will be a potential for higher and more efficient income and consumption smoothing. Furthermore, a currency union is expected to increase the GCC countries ability to engage in international capital markets and insure themselves internationally.

Overall results seem to suggest a weak integration between the GCC countries, especially in terms of trade and financial integration. However, it is not necessary that a common currency is not feasible neither that the cost of adopting a common currency may outweigh the benefit. It could be that fostering the integration process with the goal of having a common currency will help maximize the economic gains from the regional integration, and lead to further and more effective economic cooperation. According the endogenous Optimum Currency Area (OCA) argument, adoption of a single currency will be followed by an increase in trade. Similarly, Frankel and Rose (1997 , 1998 , 2000) show that monetary integration lead to significant increase in bilateral trade. A common currency between the GCC countries will probably obtain more durable commitment and eliminate exchange rate uncertainties and the transaction costs associated with them, thus help increase trade and investment among GCC countries. However, it is very crucial that the GCC countries place high priority on diversifying their economic structures as the long term success of the GCC integration would certainly be affected by economic diversification in each country. Unless effective diversification takes place, intra-regional trade is expected to remain low. Furthermore, the large dominance of the public sector within GCC countries may limit the efficiency and gains from the economic integration, especially with regards to trade, capital market and labour mobility. As pattern of specializations has shown to be a major determinant of outputs co-movement among the GCC countries, diversification plans should be coordinated in orders to lower the risk of facing asymmetric shocks, which may raise the cost of abandoning monetary independence. Finally, more empowerment should be granted

to GCC institutions in order to ensure an effective and smooth implementation of integration agreements and objectives.

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