"The Effects of Government Budget Deficit on Current Account: New Evidence from Selected Countries of the MENA Region (1994 – 2013)"

" العلاقة بين العجزفي الموازنة والحساب الجاري: أدلة جديدة من دول مختارة من الشرق الاوسط وشمال افريقيا (1994-2013)"

Prepared By:

Suzan Ali Khalayla

Supervised by:

Dr. Mohanad Ismael

"This Thesis was submitted in partial fulfillment of the requirements for the Master's Degree in Economics from the Faculty of Graduate Studies at Birzeit University, Palestine".

Summer 2016

جامعة بيرزيت
BIRZEIT UNIVERSITY

"The Effects of Government Budget Deficit on the Current Account: New Evidence from Selected Countries of MENA Region (1994 – 2013)"

" العلاقة بين العجز في الموازنة والحساب الجاري: أدلة جديدة من دول مختارة من الشرق الاوسط وشمال افريقيا (1994-2013)"

Prepared By:

Suzan Ali Khalayla

Committee

Dr. Mohanad Ismael (Supervisor) .....

Dr. Adel Zagha (Internal Examiner) .....

Dr.Bilal Fallah (External Examiner) .....

Acknowledgment

The completion of this thesis was the result of the support and encouragement of several people whom I'd like to express my gratitude to at the outset.

First, I would like to thank my supervisor, Dr. Mohanad Ismael Abu Rjaile, who guided my choice of proposal topic, and provided me with crucial and invaluable suggestions in every step of my work.

I would also like to thank Dr. Grigoris Zarotiades for his co-supervision and help in various ways in and out of our weekly meetings during my study exchange period in Greece.

Many thanks go to my thesis Committee members, Dr. Adel Zagha and Dr.Bilal Fallah, for the advice and comments during this process.

I am also very appreciative to all members of my family for their support and love throughout my studies. I would like to especially thank my parents, Aziza and Ali Khalayla, for their unique support and assistance.

Finally, I dedicate my thesis to many people whose names I cannot list all but I acknowledge their support .I thank them sincerely.

Suzan Ali

Dedication

I dedicate this piece of work to my parents, Aziza and Ali Khalayla.

ملخص تنفيذي

تهدف هذه الدراسة إلى تحليل العلاقة بين العجز في الموازنة الحكومية و الميزان التجاري لدول مختارة من منطقه الشرق الأوسط وشمال إفريقيا في الفترة الواقع بين عامي 1994 و 2013 .

تقوم هذه الدراسة على وجه التحديد باختبار فرضية التكافؤ الريكاردي القائلة بعدم وجود علاقة بين عجز الموازنة والحساب الجاري وتفسير ذلك، أن اتساع عجز الموازنة نتيجة لتقليص حجم الضرائب ذو أثر مؤقت لا بد وأن تختفي آثاره بعودة الضرائب إلى مستوياتها الأصليه . وتوضح هذه الفرضية أن انخفاض المدخرات الحكومية سيترافق مع زيادة مكافئة في المدخرات الخاصة ذلك لأن الأفراد يتوقعون بصورة رشيدة، أنه مع انخفاض المدخرات الحكومية فإن أعباءهم الضريبية سوف تزداد في المستقبل . بمعنى أن انخفاض الضرائب ليس إلا عملية مؤقتة لا يتعدى كونه تأجيلاً لدفع الضرائب التيخفضت حالياً ليعاد دفعها في فترة زمنية لاحقة. وبالتالي فإن حجم الادخار المحلي لن يتغير نتيجة للخفض الأولي للضريبة الذي ستعوضه الزيادة في الادخار الخاص.

اختبار المقترح الكينزي القائل بوجود علاقه مباشرة بين عجز الحساب الجاري وعجز الموازنة . وقد حدد المقترح الكينزي اتجاه هذه العلاقة من عجز الموازنة باتجاه عجز الحساب الجاري وهذا ما يسمى بـ " العجزين التوأم" فعجز الحساب الجاري متغير داخلي، في حين أن عجز الموازنة متغير خارجي. وتفسير ذلك، أن اتساع عجز الموازنة يأتي نتيجة لزيادة الإنفاق الحكومي، وبارتفاع مستوى الإنفاق الحكومي سينخفض مستوى الادخار الحكومي والقومي، وبانخفاض مستوى الادخار القومي ستقل المدخرات وترتفع معدلات الفائدة، وبارتفاع معدلات الفائدة في أنظمة تعتمد معدلات صرف مرنة سيزداد الطلب الأجنبي على العملة المحلية مما يؤدي إلى ارتفاع سعر صرف العملة الوطنية مقابل العملات الأجنبية، وبارتفاع سعر صرف العملة الوطنية سيزداد الطلب علي الواردات، وستصبح الصادرات أقل جذبًا للأجانب وأغلى تكلفة مما يخفض من الصادرات . ونتيجة لزيادة الواردات وانخفاض الصادرات يتشكل عجز الميزان التجاري . وبما أن الميزان التجاري هو المحدد الرئيس في تغيرات رصيد الحساب الجاري، فإن عجز الحساب الجاري سوف سيتزايد. وبذلك يؤدي عجز الموازنة إلى عجز الحساب الجاري ويترافق معه، ويعاني الاقتصاد من العجزين التوأم. لهذا، تؤكد الأفكار الكينزية وجود علاقة مباشرة بين عجزي الموازنة والحساب الجاري.

ولقد تم اختبار الفرضيتين المتنافستين في أربعة عشر دولة تشمل ست دول مصدرة للنفط و ثماني دول غير مصدرة له في منطقه الشرق الوسط وشمال إفريقيا بالاستناد إلى عضويه جمعيه الدول المصدره للنفط أوبيك ومجلس التعاون الخليجي للعام 2015 . تؤيد نتائج هذه الدراسة المقترح الكينزي في الدول المصدره للنفط ، بينما لا تؤيد نتائج الدول الغير مصدره للنفط كلا المقترحين الكنزي أو الريكاردي .

Abstract

This thesis investigates the relationship between government budget and the current account for a group of small open-developing economies selected from the Middle East and North Africa. These countries are divided into two categories, including one the one hand, six oil exporting countries and on the other, eight non-oil exporting countries, in the period from 1994 to 2013.

Specifically, this thesis tests the view of Ricardian infinite horizon illustrative agent model in which lower public savings are met by equal increases in private savings, and as a result the current account does not respond to the changes in government spending.

In contrast, a Keynesian conventional viewpoint, in which there is a fall in public savings, has a conflicting effect on the current account. New evidence from a panel data analysis supports the conventional approach of a positive relationship between government budget and current account in oil countries. However, our results don't support the Ricardian or Keynesian views for non-oil countries; our estimates support "Twin divergence" rather than "twin deficits" in case of non -oil exporting countries.

Our estimates show that a rise by one US billion dollars of the government budget deficit increases the current account to deteriorate by 0.72 US billion dollars in the case of oil exporting countries. On the other hand, the rise by one US billion dollars of the government budget deficit improves the current account by 0.29 US billion dollars in case of non-oil exporting countries .

Table of Contents

Chapter One: Introduction ……1

1.1. Preamble……..1

1.2. The Problem of the Study……...2

1.3. The Objectives of the Study……2

1.4. The Importance of the Study……...2

1.5. The Scope and Limitation of the Study……...3

1.6. The Methodology of the Study……....3

1.7. The Contents of the Study……....4

Chapter Two: Theoretical Framework.....5

2.1. Twin Deficits Hypothesis……...……..…...6

2. 2. Ricardian Equivalence Hypothesis…….…....8

Chapter Three: Literature Review……..9

3.1. Twin Deficits in Developed Countries……...……..9

3.2. Twin Deficits in Developing Countries……..……11

3.3. Twin Deficits in the MENA Region……...……12

3.4. Conclusion……...……14

Chapter Four: The Model and Data Description.....15

4.1. The Model……..….…….....15

4.2. Data Sources and Definitions of Variables Used In the Model…….……..…….....17

4.3. Statistical Analysis of Variables Used in the Model……..……..18

Chapter Five: Methodology……...……20

5.1. Panel Estimation Method……..……...20

5.2. The Diagnostic Tests of Fixed Effects Model…….……..……21

5.2.1 Testing for Serial Correlation……...……...21

5.2.2. Testing for Heteroskedasticity……..21

5.3. Model Estimating Method Considering Autocorrelation and Heteroskedasticity ……..…22

5.3.1. Fixed Effects Estimator with Driscoll and Kraay Standard Error…….....22

5.3.2. Fixed Effects Estimator with Robust Standard Error…….....22

Chapter Six: Empirical Results from Oil Exporting Countries of the MENA Region….…23

6.1. Panel Estimation Method ……..……..23

6.2. Testing for Autocorrelation and Heteroscedasticity Results……..…….…….…….23

6.3. The Estimated Model ……..…….…….…24

Chapter Seven: Empirical Results from Non-Oil Exporting Countries of MENA Region……...26

7.1. Panel Estimation Method ……..26

7.2. Testing for Autocorrelation and Heteroscedasticity Results……..…….…….…27

7.3. The Estimated Model ……..……..…27

Chapter Eight: Conclusions and Recommendations.....30

8.1. Concussions……..……....…...30

8.2. Recommendations ……..…….……..…...32

References ……..…..…..,……34

Appendix A……,.…….....…..….39

Appendix B: Statistical outputs for Oil Exporting Countries…….……44

Appendix C: Statistical outputs for Non-Oil Exporting Countries……46

List of Tables

Table 4.1: Statistics of Variables for the MENA Countries……..……....18

Table 6.1: Estimation Results for Oil Exporting Countries in the MENA Region…….…..…23

Table 6.2: Estimation Results for Oil Exporting Countries in the MENA Region ……...…..24

Table 7.1: Estimation Results for Non- Oil Exporting Countries in MENA Region ….……26

Table 7.3: Estimation Results for Non-Oil Exporting Countries in MENA Region …….….28

Table B.1: Fixed Effects Regression…….……..……44

TableB.2: Modified Wald test for groupwise heteroskedasticity……44

Table B.3: Wooldridge test…….45

Table B.4: Fixed Effect Regression with Robust Standard Errors……..45

TableC.1: Fixed Effects Regression…….……...……46

Table C.2: Modified Wald test for groupwise heteroskedasticity…….……46

Table C.3: Wooldridge test……...…47

Table C4.: Fixed Effect Regression with Robust Standard Errors……...……..…..47

List of Figures of Appendix A

Figure A.1: Current Account (CA) in Current US Dollars (billions)……39

Figure A.2: Government Budget (GB) in Current US Dollars (billions)…….……40

Figure A.3: Saving-Investment Gap (SI) in Current US Dollars (billions)……..41

Figure A.4: Money Supply (M_2) in Current US Dollars (billions)…….……42

Abbreviations

CA: Current Account

FE: Fixed Effects Model

GB: Government Budget

GCC: Gulf Cooperation Council

IMF: International Monetary Fund

M_2 : Money Supply

OPEC: Organization of the Petroleum Exporting Countries

REH: Ricardian Equivalence Hypothesis

SI: Saving-Investment GAP

TDH: Twin Deficits Hypothesis

UNCTAD: United Nations Conference on Trade and Development statistics

WB: The World Bank

Chapter One: Introduction

1.1. Preamble

This study aims to investigate the relation between government budget (hereafter, GB) and the current account (hereafter, CA) for a group of selected countries of the MENA region categorized in two groups-- oil and non-oil exporting countries.

The relationship between CA deficit and GB deficit is widely known as twin deficits. The GB deficit occurs when total government expenditures exceed total government revenues and the CA deficit arises when we have a deleterious difference between revenues and costs from trade plus net transfers to the country (Kiran, 2011).

Twin deficits more likely arise if the economy is comparatively exceedingly open and joined world markets and fiscal expansions are determined (Corsetti and Muller, 2006).

As a consequence of CA deficit, the country can borrow from other countries, and it will have to pay back afterwards. It is important to point out here that CA deficit is not unarguably a negative case for a country's economic growth, if the country's opportunities for investing in the borrowed resources are more agreeable than the chances available of paying back loans, then a successful investment will have a high return that could be enough to cover loan principals. So the country will get out of its debt in the future (Vyshnyak, 2000).

1.2. The Problem of the Study

This study highlights one of the fiscal policies' instruments and how it can be used in managing the economies of the MENA region countries.

The main question that will be answered in this study is: does the change in government budget affect the current account?

In order to answer this question the following sub-questions need to be answered.

- How does the current account change over in the period between 1994 and 2013?
- What are the components of the current account and how they vary during the period under study?
- What effect does each component have on the current account for the period?
- What are the recommendations that can be extracted from the results?

1.3. The Objectives of the Study

The main objective of the study is to analyze the impact of the government budget on the current account in the MENA region from 1994 to 2013. Moreover, the specific goals of the study to be achieved include the following:

- Observing government budget path over time,
- Identifying the components of the current account and how they vary with time,
- Suggesting some recommendations based on the results of the inquiry.

1.4. The Importance of the Study

The twin deficits have critical policy implications, if the main reason for rising current account deficit will be growing budget deficit. In this case, policy makers might focus on decreasing the budget deficit (by reducing government expenditures or raising taxes). However, if such a view about the causal effect of the fiscal deficit is wrong, then reduction in the government budget might not resolve the current account situation. Further considerations are needed for more relevant and urgently needed policy decisions.

In addition, not enough studies have covered this area of research in developing countries, in general, and in the MENA region, in particular.

1.5. The Scope and Limitation of the Study

This study is conducted on a group of selected countries of the MENA region (Algeria, Cyprus, Egypt, Iran, Jordan, Lebanon, Morocco, Oman, Qatar, Saudi Arabia, Syria, Tunisia, Turkey, and United Arab Emirates) which have been divided into two groups: oil exporting countries, including Algeria, Iran, Oman, Qatar, Saudi Arabia, and United Arab Emirates, and non-oil exporting countries such as Cyprus, Egypt, Jordan, Lebanon, Morocco, Syria, Tunisia, and Turkey, since the income levels and economic characteristics of developing oil exporting countries are different from the non-oil exporting countries, which can be described as oil-dependent open economy where exports, government revenue and income are closely linked with oil revenues.

The data limitation lead to the exclusion of some MENA countries from the study such as Iraq, Libya , Sudan and Palestine, since there are shortages of data for some variables under the period of the study; and data shortages affect the consistency of the results.

1.6. The Methodology of the Study

The empirical analysis undertaken in this study relies on a panel data set for the MENA region countries with annual data from 1994 to 2013. The main data sources were published by the International Monetary Fund (IMF), The World Bank (WB), and the United Nations Conference on Trade and Development statistics (UNCTAD).

The research methods of this thesis adopt country-group study approaches and use quantitative methods to analyze the effects and the direction of the relationship that comes from the government budget to the current account and its macroeconomic implications for the stability of the MENA region countries. Panel econometric method is used to determine

the impact of the changes in government budget on the current account of a group of fourteen MENA countries.

1.7. The Contents of the Study

This study is divided into eight main chapters, including this introductory chapter; chapter two sets the theoretical background; chapter three presents the literature review; chapter four presents the model and data; chapter five contains the methodology; chapter six highlights the empirical results from the oil exporting countries of the MENA region; chapter seven shows the results from non-oil exporting countries; and chapter eight concludes the study with some learned lessons and the recommendations .

Chapter Two: Theoretical Framework

To clarify the relationship between the government budget and the current account in a small open economy, it is preferable to start with the national income (Y) accounting identity. Y is the output produced by the economy, and it is the sum of the final output of domestic goods and services consumption (C), investment (I), government expenditure (G), and the net exports (EX-IM). Therefore, the Y identity is written as follows:

$$Y = C + I + G + (EX - IM) \quad (1)$$

Disposable income (YD) is equal to national income plus the difference between transfers (TR) and taxes (T):

$$YD = Y + (Tr - T) \quad (2)$$

An alternative definition of disposable income is connected to consumption (C) and saving (S):

$$YD = C + S \quad (3)$$

Equalizing equations (2) and (3), inserting equation (1) into (2), and makes some cancelations and arrangements we get;

$$(EX\text{-}IM + Tr) = (T - G) + (S - I) \quad (4)$$

$$CA = GB + SI \quad (5)$$

Where the term CA denotes (EX-IM +TR), the term GB indicates (T-G) and the term SI indicates (S-I). Equation (5) indicates the current account deficit is a result of the government budget deficit or the surplus of investment on savings or both. In addition to changes in governmental policies that increase the GB deficit, the latter will worsen CA by an identical amount considering that the levels of saving and investment are stable over time. Likewise, if

we left the savings rate constant over time, GB will crowd out investment or cause foreign capital inflow or both. Therefore, anything that affects GB, saving or investment, will disturb the current account and the capital flows.

According to macroeconomic theory, the twin deficits have been captured by two main competing theories, the twin deficits hypothesis and the Ricardian equivalence hypothesis.

2.1. The Twin Deficits Hypothesis

The positive association of CA deficit and the GB deficit is known widely as the twin deficits hypothesis (hereafter, TDH) and is derives from the Keynesian convention. The Keynesian interpretation claims a direct and positive relationship comes from the budget deficit towards the current account deficit. Many economists such as Fleming (1962) and Mundell (1963) have argued that government budget deficit causes current account deficit through the exchange and the interest rate channels. In a small open economy IS-LM framework, an increase in the budget deficit would induce rising pressure on interest rates, thus, producing capital inflows. So this will lead to an appreciation of the exchange rate through the high demand for domestic financial assets, leading to an increase in the current account deficit. According to this view an expansionary fiscal policy stimulates output and demand which has a worsening effect on the CA. This suggestion states that a budget deficit will lead to a current account deficit. And clearly a budget surplus will recover the current account deficit.

The government is a net borrower, if it faces budget deficit. Total national savings are equal to the public and the private savings. The national savings will decline if we have negative public saving. With a lower level of national savings, the interest rates would increase, which will lead to rise in the exchange rate. An increasing exchange rate will attract more imports

and make exports expensive, which can lead to the deterioration of the trade balance which is the key factor in the current account deficit.

As an hypothetical example, suppose a small open economy with perfect capital mobility under float exchange rate is facing growing GB deficit, which will affect the country's interest rate. The domestic interest rate increases above the international rate, which attracts the foreign financial capital flow into the country, and this increases the foreign demand for the local country's currency in foreign exchange market, leading to currency appreciation which ends up with expensive exports and cheaper imports and thus causes the current account deficit.

Assume again the same small open economy facing GB deficit, but with a fixed exchange rate. That is, in case of the appreciation of exchange rate that driving the central bank to interfere to hold the exchange rate persistent. So it purchases the foreign money, in exchange for domestic money. That causes the home country's money stock to rise and interest rate starts to decrease. As the economy is small and open, when the interest rate decreases below international interest rate, as a consequence of increasing money supply, investors will invest abroad. This capital outflow causes the exchange rate to decrease, which makes net exports to increase and improve the current account. That means the degree of capital mobility and the interest rates are the main links between public policy and the current account (Dornbusch, 1976).

If the twin deficit hypothesis is valid, a government can improve the country's current account through fiscal reduction and vice versa.

2.2. The Ricardian Equivalence Hypothesis

The Ricardian Equivalence Hypothesis (hereafter, REH) was developed by Barro (1989). The REH hypothesises the nonexistence of any relationship between the government budget deficit and the current account deficit; this is because cuts in taxes are matched by an increase in savings because people expect the government to raise the taxes in the future. This means that any fiscal increase or reduction induces the intertemporal rearrangement of savings, leaving the current account unaffected. In line with this approach, a raise in the budget deficit, raises private savings and has no influence on the CA.

According to REH, society will rationally assume that reduced tax will have to be paid for in the forthcoming years. Consequently, people will increase savings to pay for future increased burden. They know that taxes will increase again to pay for the budget deficit so they save the additional cash and they use it to pay for the future tax increases. The tax has simply been postponed, not actually taken away. If this were perfectly true, then the budget deficit would have no effect on the current account because it would not change national savings.

Chapter Three: Literature Review

The twin deficit hypothesis claims that an increase in GB deficit will cause a related increase in CA deficit. But testing this hypothesis turned out different results for different countries. The relationship between budget deficit and current account deficit started to attract researchers' attention in the 1980's. There are extensive empirical studies that examine the twin deficit relationship and these studies can be classified in three groups. The first group contains studies that analyze the twin deficit hypothesis in developed countries; the second group includes the studies that have been undertaken in developing countries; and the third group includes studies that have been done about the MENA region countries.

3.1 Twin Deficits in Developed Countries

In the 1980's both the US current account deficit and the budget deficit increased a lot. As a result of this co-movement, several economists such as McKinnon (1980), Laney (1984), and Gordon (1986) recognize a significant part of the decline in the current account balance due to the budget deficit and the strong appreciation of the dollar.

Mohsen (1989) studies the twin deficit hypothesis in United States during the period from 1973 to 1985, by applying OLS and 2SLS techniques of flexible exchange rate. The author concurs that the budget deficit has a negative impact on the current account in the short run as well as in the long run.

Several papers go beyond the simple case study in developed countries. For example, Piersanti (2000) uses an augmenting general equilibrium model to express the theoretical relationship between the budget deficit and current account deficit for OECD countries during the 1970–1997 period. He supports the opinion that current account deficits have been linked with expected future budget deficits during that period. The empirical consequences of

examining the causality of these two deficits using causality tests of twenty developed and developing countries have given strong indication of causality between the twin deficits for developing countries, but less credible results for developed countries.

Bartolini and Labiri (2006), investigate empirically the causality between the budget deficit and the current account deficit of OECD countries. By applying a panel regression technique, with fixed effects on data from 1972 to 2003, the study shows that the relationship comes from the budget deficit towards the current account deficit.

Kim and Roubini (2008) study the effects of government budget shocks on the current account and real exchange rate in the US during the period 1973 to 2004 by applying VAR (Vector Auto-Regression) models. In contrast to the expectations of most theoretical models, their results suggest that expansionary government budget deficit shock improves the current account and depreciate the real exchange rate. Then, a "twin divergence "rather than "twin deficits" emerges from their enquiry.

Furthermore, Chang and Hsu (2009) study the causality relationship between the budget deficit and the current account deficit in five north European countries, the Asian Tigers, and the United States by adopting data from 1980 to 2007. Using the simpler Granger non-causality procedure, the authors conclude that the twin deficit hypothesis exists, but the strength of the relationship varies between the economies under study.[1]

In addition, Konstantinos and Emmanuel (2011) examine the causal linkages between the internal and external deficits of the Greek economy, during the period from 1960 to 2007, by using the ARDL cointegration methodology, error correction modeling and Granger

[1] The five north European countries are Denmark, Finland, Iceland, Norway, and Sweden. The Asian Tigers are Hong Kong, Korea, Singapore and Taiwan.

causality. The authors find out the validity of twin deficits hypothesis for the Greek case over the period from 1960 to1980, with causality running from the budget deficit to the current account deficit. However, over the period from 1981 to 2007 the causal relationship is reversed.

3. 2.Twin Deficits in Developing Countries

Significant fiscal expansions and external instabilities, which caused macroeconomic instability in a large number of advanced countries, have motivated researchers examining the issue of twin deficits in developing countries as well.

Puah, Lau and Tan (2006) examine the existence of the twin deficit hypothesis in the Malaysian economy over a period from 1970 to 2005, by applying Johansen-Juselius cointegration test and Granger non-causality test. The empirical results of the first test fail to show any significant long run equilibrium linkages between budget and current account deficits, while the findings of Granger non-causality test support unidirectional causality running from current account to budget balances.

Furthermore, Perera and Liyanage (2010) use Granger causality test for Sri Lanka quarterly data of the period from 1990 to 2009. The results support the existence of long-run relationship between budget deficit and current account deficit and therefore, this relationship confirms that current account in Sri Lanka is highly dependent on budget deficit.

Recently, Sulikova, Siniccakova and Horvath (2014) use the vector error correlation model, Granger causality tests and forecast variance decomposition, involving three variables: current account, budget balance, and investments over quarterly data that cover the period from 1999 to 2011 of Baltic countries (Estonia, Latvia and Lithuania). The authors find out different empirical results for each country under study that are due to the macroeconomic

particularities. They approve the validity of the twin deficit hypothesis in the case of Estonia and Lithuania. On the other hand, the findings concerning Latvia are undecided.

3.3 Twin Deficits in the MENA Region

The question arises obviously whether it is possible to find a relation between government budget and current account motivate researchers in the MENA region countries, for instance Alkaswani (2000) examines the relationship between trade deficit and budget deficit in Saudi Arabia, using annual data covering the period from 1970 to 1999, using Johansen cointegration method. It is shown that the direction of the causality runs from trade deficit towards the budget deficit.

Further, Naeme (2008) studies twin deficits hypothesis in Lebanon using the Granger causality test over the period from 1970 to 2006. The author finds out the existence of a unit-directional causal relationship in the short run between the budget and current account deficits.

Similarly, Azgun (2012) studies the relationship between budget deficits and current account deficits in the Turkish economy from 1980 to 2009, using VAR Granger causality test and regression analysis. The result shows that there is a causality relationship running from the budget deficits towards current account deficits.

On the other hand, Marinheiro (2008) examines the validity of the twin deficits for Egypt during the period 1974 to 2003 using Granger-causality approach. The author concludes that there is a presence of only a weak long-run relationship between the budget deficit and the current account deficit rejecting the TDH.

Moreover, Eldemerdash, Metclaf and Maioli (2009) study the twin deficits hypothesis by measuring the responses of the external deficit to the changes in the budget deficit induced in

twelve Arab countries[2] during the period 1970 to 2010. The authors find out that one percent increase in government budget deficit to GDP ratio tends to deteriorate the current account balance to GDP ratio by between 0.45 to 0.85 percentage points.

Furthermore, Merza, Alawin and Bashayreh (2012) study twin deficits Hypothesis in case of Kuwait by applying VAR Model over quarterly data over the period1993 to 2010, the empirical results support the long run equilibrium relationship between budget and the current account. This relationship explained that budget balance responds negatively to the shock in the current account balance. The causality relationship direction is approved that it comes only from the current account to government budget in the case of Kuwait.

It is worth to mention that, Mossadak (2013) studies the Twin Deficit hypothesis in Morocco during the period 1980 to 2012 through Bivariate VAR estimation model .The result implies the existence of an inverse relationship going from the current account to the government budget as well.

More recently, Eldemerdash, Metclaf and Maioli (2014) study twin deficits hypothesis in oil and non- oil Arab economies with fixed exchange rates some of which are oil exporters during the period 1975 to 2010, by using panel data analysis and Granger-causality test for the fixed exchange – based countries. The authors' findings support the conventional theory of positive relationship between fiscal and external balances, with causality running from former to later in oil courtiers, whereas it supports the Ricardian view for non-oil countries.

[2] These countries are Bahrain, Egypt, Jordan, Kuwait, Morocco, Oman, Qatar, Saudi Arabia, Syria, Tunisia, and United Arab Emirates.

3.4. Conclusion

According to the literature of the twin deficits hypothesis there are three main different approaches that have been generally employed. The first approach investigates the twin deficits with causality tests and structural Vector Auto Regressive (VAR) models. The second followed the long-term correlation between indicators of the government budget and the current account, using cointegration techniques. The third approach identifies exogenous changes in the government budget and uses regression analysis to study their impact on the current account. In this thesis, the relationship and its direction that come from the government budget to the current account have been examined using the third approach with the panel estimation method for fourteen countries of the MENA region divided in two groups-- oil and non-oil exporting countries over the years between 1994 and 2016, the combination of the countries (including Arab and non-Arab countries), the time period of the study, and the macroeconomic model; theses were not part of any previous study in the empirical literature for the MENA region.

Chapter Four: The Model and Data Description

4.1. The Model

We start from a simple econometric description as in equation (5), which incorporates the TDH and REH views stated in Chapter Two.

$$CA_{it} = \alpha + \beta_1 GB_{it} + \beta_2 SI_{it} + u_{it} \qquad (6)$$

CA_{it} is current account and it's the dependent variable

GB_{it} is government budget and it's the main independent variable with the following hypothesis :

H0: the government budget has a positive effect on the current account.

H1: the government budget has no effect or negative effect on the current account.

SI_{it} is the gap between gross domestic savings and gross investment, and its independent variable with the following hypothesis:

H0: the saving -investment gap has positive effect on the current account.

H1: the saving- investment gap has no effect or negative effect on the current account.

i (i=1,..,14) = Country index, , t(t=1994,..,2013) = time .

Since most of the MENA countries, like many developing countries, have ineffective bond markets and they don't have highly developed commercial and central banking system, they depend much more on central banks to finance the government spending program and their

government budget deficits. That is, in these same small open economies, government budget deficit with fixed exchange rate regime (as the MENA countries) crowds out net exports by causing the nominal exchange rate to appreciate forcing the central bank to intervene to hold the exchange rate constant. It buys the foreign money, in exchange for domestic money. This intervention causes the home country money stock to increase and interest rate starts to decline. As these economies are small and open, when the interest rate tries to decrease below world interest rate as a result of increasing money supply, investors will invest abroad. This capital outflow causes the exchange rate to decrease, causes net exports to increase and current account deficit to decrease (Eldemerdash, 2009).

In some situations, everything else being equal the increase in the money supply is likely to cause the inflation. This domestic inflation will make the exports relatively less competitive and export demand will decrease and import demand will increase. Therefore, that will deteriorate the current account situation.

Furthermore, an increase in the money supply doesn't always affect the current account situation, in some circumstances an increase in the money supply does not affect the interest rate, when the interest rate stays the same we don't get the capital inflow or outflow. There were a few reasons for this: one is that people prefer to hold additional money. Banks do not lend the extra reserves they gained from selling assets. Therefore, increasing money supply didn't lead to an excess supply of local currency and depreciation in exchange rate. Or in some special situations when capital flow depends on the interest rate in dollar or other currencies not in the interest rate of local currency. Also in case of the liquidity trap when the interest rate is in its lower rates, in this case increasing money supply does not lower the interest rate .Therefore, we consider the money supply as an explanatory variable.

Also we include in the model time and country dummy variables. This is to control factors that vary overtime and affect the sampled countries. Consequently, the empirical model that covers the central features of both theories, in the context of small open economies, is given the following equation;

$$CA_{it} = \alpha + \beta_1 GB_{it} + \beta_2 SI_{it} + \beta_3 M_{2it} + \sum_{t=1994}^{2013} D_{it} + \sum_{t=1994}^{2013} \lambda_t C_t + u_{it} \qquad (7)$$

Where:

M_{2it} is the money supply.

D_{it} is time dummy variable

C_t is country dummy variable

The main difference between TDH and REH relates to the sign of β_1.The TDH suggests that an increase in government budget surplus/deficit tend to enhance/worsen the current account surplus/deficit situation; in this case $\beta_1 > 0$. On the other hand, the REH claims that $\beta_1 = 0$.

4.2. Data Sources and Definitions of Variables Used In the Model

In this thesis , the econometric model investigation depends on balanced panel data set from fourteen select countries of MENA Region (Algeria (DZA), Cyprus(CYP), Egypt (EGY), Iran (IRN), Jordan (JOR), Lebanon (LBN),Morocco (MAR),Oman (OMN), Qatar (QTR) , Saudi Arabia (SAU), Syria (SYR), Tunisia (TUN), Turkey (TUR) and United Arab Emeritus (UAE)) with annual data over the period from 1994 to 2013; these countries are divided into oil exporting and non-oil exporting countries according to OPEC and GCC, 2015 membership. The data for all countries and variables in the sample were taken from

International Monetary Fund (IMF), World Bank (WB), and United Nations Conference for Trade and Development (UNICTAD).

GB is considered as the difference between general government revenues and general government expenditure. General government revenue consists of taxes, social contributions, grants receivable, and other government revenues, while general government expenditure includes all government total expense and the net acquisition of nonfinancial assets.

Gross domestic savings (GDS) is derived by subtracting final consumption expenditure from gross domestic disposable income.

Gross investment (GI[3]) is measured by the difference between the total value of the gross fixed capital formation, changes in inventories and acquisitions and disposals of valuables for a unit or sector.

Whereas, the money and quasi money (M_2) comprise the sum of currency outside banks, demand deposits other than those of the central government, and the time, savings, and foreign currency deposits of resident sectors other than the central government.

4.3. Statistical Analysis of Variables Used in the Model

In this section, we present descriptive statistics of variables used in the model.

Table (4.1) gives the minimum (Min) value and the maximum (Max) value for oil exporting and non-oil exporting countries in US billion dollars.

[3] Total Investment is used as a proxy for gross investment because the real statistics of gross investment of the sample countries are not available.

Table 4.1: Statistics of Variables for MENA Countries

Variables	Observation	Min.	Max.
CA	280	-75.008	164.764
GB	280	-38.2992	154.91
SI	280	-124.0791	184.217
M_2	280	3.65164	499.213

As shown in table (4.1), the current account ranges between -$75 and $165 billion, it shows that some countries are running current account surplus such as United Arab Emirates and other oil producing countries in particular in the 2002-2008 period when oil prices were high. However, some other countries were facing current account deficits such as Jordan and Egypt. Current account reached its maximum about ($165 billion) in Saudi Arabia, and it reached its minimum ($-13 billion) in Turkey.

On the other hand, government budgets fluctuate from -$38 to $155 billion, some countries were facing budget surpluses and others were facing budget deficits and the remaining reaching near balanced budgets. Government budget reached its maximum surplus ($154.9 billion) in Saudi Arabia, while it reached maximum deficit (-$38 billion) in Egypt.

The gap between gross domestic savings and gross investment ranged from -$124 to $185 billion, and reached its maximum ($184.2 billion) in Saudi Arabia, and it reached its minimum (-$124 billion) in Iran.

Furthermore, the money supply ranged from $3 to $500 billion, it reached its maximum ($ 499 billion) in Turkey, and it reached its minimum ($3.7 billion) in Oman.

Chapter Five: Methodology

5.1. Panel Estimation Method

The main advantages of applying panel data estimation method over time series or cross section data estimation methods is that it allows the intercepts and error variances to differ freely across entities; it also gives more degrees of freedom and less of the collinearity among independent variables (Hsiao, 2003).

The fixed-effects model controls all time-invariant differences between the individuals, so the estimated coefficients of the fixed effects models cannot be biased because of omitted time-invariant characteristics (like language, culture, religion, political system, etc.), generally the fixed effects model is represented as:

$$y_{it} = ai + \beta_1 x_{it} + u_{it} \quad (8)$$

Where,

- y_{it} is the dependent variable.
- ai (i=1,…,.n) is the unknown intercept for each entity
- x_{it} represents independent variable.
- β_1 is the coefficient.
- u_{it} is the error term, $u_{it} = \mu_{it} + \nu_{i\tau}$, where μ_{it} are individual-specific, time-invariant effects (in a panel of countries; this could include language, weather, geographic location, etc.) (Baltagi, 2001).

5.2. The Diagnostic Tests of Fixed Effects Model

5.2.1 Testing for Serial Correlation

Since serial correlation in linear panel data models biases the standard errors and makes the results less effective, we need to recognize auto correlation in the idiosyncratic error term in a panel-data model. A new test for serial correlation fixed effects models is discussed by Wooldridge (2002). As it requires relatively few assumptions, it is easy to implement and this test is also robust to conditional heteroscedasticity as well. Wooldridge's test null hypothesis is no serial correlation vs. the alternative of the serial correlation (Drucker,2003).

5.2.2. Testing for Heteroskedasticity

When heteroskedasticity is present, the standard errors of the estimates will be biased and we should calculate robust standard errors correcting the possible presence of heteroskedasticity. While the error procedure is homoskedastic within crosssectional units, its variance varies across units, and in this case we have the group wise heteroskedasticity.

Modified Wald statistic test for groupwise heteroskedasticity calculates heteroskedasticity in the residuals of a fixed effect model under the null hypothesis of homoskedasticity (Baum,2001).

5.3. Model Estimating Method Considering Autocorrelation and Heteroskedasticity

5.3.1. Fixed Effects Estimator with Driscoll and Kraay Standard Error

Standard error estimations of commonly applied covariance matrix estimation methods are biased and hence statistical implication that is grounded on such standard errors is unacceptable. Driscoll and Kraay (1998) error structure is assumed to be heteroscedastic, autocorrelated up to some lag, and possibly correlated between the groups (panels), and temporal dependence when the time dimension becomes large. Because this nonparametric technique of estimating standard errors does not place any restrictions on the limiting behavior of the number of panels, the size of the cross-sectional dimension in finite samples does not constitute a constraint on feasibility - even if the number of panels is much larger than T .These standard errors are robust to very general forms of cross-sectional nonparametric covariance matrix estimator which produces heteroskedasticity consistent standard errors that structure is assumed to be heteroskedastic, and serially correlated (Hoechle, 2007).

5.3.2. Fixed Effects Estimator with Robust Standerd Error

When fixed effect model faces hetroskedasticity, so the homoskedasticity assumption is violated, the covariance matrix of the parameter estimates can be biased and unreliable under heteroskedasticity. Alternative method of reducing the effects of heteroskedasticity is to employ robust or heteroskedasticity-consistent standard error estimator of fixed effects model. With this approach, the fixed effects model is estimated with robust standerd errors (Hoechle, 2007).

Chapter Six: Empirical Results from Oil Exporting Countries of MENA Region

6.1. Panel Estimation Method

We applied our mode for the oil exporting countries data, our fixed effects model estimation results of equation (7) are shown in table (6.1). Here and after we put only the statically significant variables, for more details you can see appendix B.

Table 6.1: Estimation Results for Oil Exporting Countries in the MENA Region
Methodology: Fixed effects
Dependent variable: CA

	Fixed effects
GB	0.7221938
	(9.66)***
SI	0.0870099
	(2.00)**
M_2	0.143178
	(4.42)***
Constant	-10.20701
	(-1.72)

Notes:. Variable in parentheses indicates t-statistics.
* indicate that the variable is significant at 10% level.
** indicate that the variable is significant at 5% level.
*** indicate that variable is significant at 1%.

6.2. Testing for Autocorrelation and Heteroscedasticity Results

The standard error component in our fixed effects model as shown in table (6.1) assumes that the estimator disturbances are homoscedastic. After running the fixed effects model it's allowed to perform Wooldridge test for serial correlation as well as modified Wald test for hetroskedasticity. The Wooldridge test probability obtained for equation (7) is 0.085 which means that the null hypothesis cannot be rejected. This indicates that there is no serial correlation of our model, where the modified Wald test Probability is 0.0001; thus, we reject

the null hypothesis of homoscedasticity. Consequently, our model confronts the problem of heteroskedasticity.

6.4. The Estimated Model

According to our results from the previous subsection, our model under study faces heteroscedasticity; to solve this problem, it's possible to apply fixed effects with robust standard errors as shown in table (6.3).

Table 6.2: Estimation Results for Oil Exporting Countries in the MENA Region
Dependent variable: CA

	Fixed Effects- with robust Std.Err.
GB	0.7221938
	(7.41)***
Constant	-10.20701
	(0.358)
Number of observations	120
Overall R^2	0.8846

Notes: Variable in parentheses indicates t-statistics
* indicate that the variable is significant at 10% level.
** indicate that the variable is significant at 5% level.
*** indicate that variable is significant at 1%

The results in table (6.2) strongly support the TDH and reject the REH. Assumed that the net saving is constant, a one US billion dollar increase in the government budget surplus/deficit tends to improve/deteriorate the current account by 0.72 billion US dollars. That could be explained by the increase of government budget deficit which is due to an increase of government spending in developing oil exporting country .As the government spending is an effective demand component , the increase in government spending will increase the level of income through government spending mechanism. The higher the income level, the higher the level of imports, and then expanding deficit foreign trade and current account deficit. This

finding is similar to the results obtained by Enders and Lee (1990), Vamvoukas (1997), Mohammedi (2004), Eldemerdash, Metclaf and Maioli (2009; 2014).

The gap between gross domestic savings and gross investment has no effect on the current account, due to the dependence of oil exporting economies structure mostly on oil revenues that do not go through savings or investment. The oil revenues are invested via the financial channel abroad and sovereign funds, leaving the domestic savings –investment levels the same.

Furthermore, our results show there is no relationship between the money supply and the current account. The reason for this is that the oil exporting countries under study apply either fixed exchange rate or tightly managed floats with the US dollar. A result of these exchange rate regimes is that their terms of trade are connected with the US dollar with reference to other major currencies. Thus, the flow depends on interest rate in US dollar and foreign currencies, not affected by the interest rate in local currencies. In their study Eldemerdash, Metclaf and Maioli (2014) confirm this result.

Chapter Seven: Empirical Results from Non-Oil Exporting Countries of the MENA Region

7.1. Panel Estimation Method

By the same token, we applied the model under study in case of non-oil exporting countries. Fixed effects estimation of equation (7) is shown in table (7.1).

Table 7.1: Estimation Results for Non- Oil Exporting Countries in the MENA Region
Methodology: Fixed effects
Dependent variable: CA

	Fixed effects
GB	-0.2969564
	(-4.53)***
SI	0.1064918
	(5.01)***
M_2	-0.125344
	(-18.96)***
Constant	-0.8405842
	(-0.55)
Number of observations	160
Overall R^2	0.8796

Notes:. Variable in parentheses indicates t-statistics.
* indicate that the variable is significant at 10% level.
** indicate that the variable is significant at 5% level.
*** indicate that variable is significant at 1%.

7.2. Testing for Autocorrelation and Heteroscedasticity Results

The standard error component in our fixed effects model as shown in table (7.1) in the previous subsection assumes that the estimator disturbances are homoscedastic. After running the fixed effects model it's allowed to perform Wooldridge test for serial correlation as well as modified Wald test for hetroskedasticity. The Wooldridge test probability obtained for equation (7) is 0.0111 and it is less than 0.05 which means that we have to reject the null hypothesis. This indicates that there is serial correlation of our model, where the modified Wald test Probability is 0.0000; therefore, we reject the null hypothesis of homoscedasticity. Subsequently, our model faces two problems: serial correlation and heteroskedasticity.

7.3. The Estimated Model

The model under study faces serial correlation and heteroscedasticity; to solve this problem, it's possible to apply Driscoll and Kraay estimator as shown in table (7.3). Here and after we put only the statically significant variables, for more details you can see appendix C.

Table 7.2: Estimation Results for Non-Oil Exporting Countries in the MENA Region
Dependent variable: CA

	Driscoll and Kraay estimator Std.Err.
GB	-0.2969564
	(-1.93)*
SI	0.1064918
	(5.26)***
M_2	-0.1253447
	(-15.50)***
Constant	0.6077115
	(1.04)
Number of observations	160
Within R^2	0.8776

Notes: Variable in parentheses indicates t-statistics
* indicate that the variable is significant at 10% level.
** indicate that the variable is significant at 5% level.
*** indicate that variable is significant at 1%.

In contrast to the predictions of most theoretical models, the results in table (7.2) don't support the REH or the TDH. A one US billion dollar increase in the government budget deficit tends to improve the current account by 0.29 billion US dollars. A one percent increase in the government budget deficit has positive effects on the current account. Government budget deficits leading to a crowding out of investment may reduce the long run rate of productivity growth of the economy and thus lead to a weakening of the value of the currency. That is, when the exchange rate falls in these small open economies with fixed nominal exchange rate regime, the fall causes the net exports to increase and trade surplus/deficit to increase/decrease and improves the current account . This result supports the twin divergence rather than the twin deficits which is similar to results obtained by Kim and Roubini (2008).

The wider the positive saving-investment gap, the greater is the improvement in the current account. A one US billion dollar increase/decrease in the saving-investment gap tends to improve/deteriorate the current account by 0.11 US billion dollars. This means that, everything being equal, if the positive saving- investment gap increases, the domestic saving will increase. An increase in domestic savings means people are spending less (lower consumption); therefore, this would tend to lower imports and improve the current account situation. Furthermore, as the domestic savings increase, the opportunity to finance the domestic investment will increase as well. Our results are parallel to Eldemerdash, Metclaf and Maioli (2014).

Moreover, there is a negative relationship between the money supply and the current account. An increase/decrease in money supply by one US billion dollar will deteriorate/improve the current account ratio by 0.13 US billion dollars. This means that everything else being equal the increase in the money supply is likely to cause the inflation. This domestic inflation will

make the exports relatively less competitive and export demand will fall and imports demand will increase. Therefore, that will increase the current account deficit. . Our results are similar to the results found in Mohammad (2010), Dwyer and Lewis (1991), Tso (1988), Rotemberg (1985), Roberts (1978), and Allen [(1972).

Chapter Eight: Conclusions and Recommendations

8.1. Conclusions

In this study, we examined the association between current account and governmental budget for the MENA region (small open economies) to test the validity of TDH in which a fall in public savings has an adverse effect on the current account, against REH in which lower public savings are met by equal increases in private savings, and as a result, the current account does not respond to the changes in government spending in some countries from the MENA region. This thesis contributes to the existing literature both in terms of the sample studied (i.e. countries depending on oil versus non-oil countries) as well as the variables considered and the time period.

Empirical investigation shows that the twin deficit hypothesis is supported by using panel econometric method of estimation showing that the twin deficits hypothesis was valid for oil exporting countries of the MENA region. Statistically, there is a positive relationship between government budget and current account, in the context of equation (7):

$$CA_{it} = \alpha + \beta_1 GB_{it} + \beta_2 SI_{it} + \beta_3 M_{2it} + \sum_{t=1994}^{2013} D_{it} + \sum_{t=1994}^{2013} \lambda_t C_t + u_{it}$$

The results of oil exporting countries in this study show that all changes in the government budget are transmitted to the current account. This result is compatible with similar studies done for the other developing oil exporting countries. If the twin deficit hypothesis holds, several serious consequences for an economy exist. Reduction in current account deficit will require fiscal adjustment; specifically, reduction in government budget deficit is a necessary condition for decreasing current account deficit or increasing current account surplus. It is important for oil exporting governments to diversify the sources of national income; the

economic transformation will result in minimal fluctuations in the government's budget, thus solving the "twin deficits" problem.

On the other hand, our results reject the existence of the twin deficits hypothesis, and support the twin divergence in the case of non-oil exporting countries. In this case, a reduction in current account deficit will also require an increase in domestic savings, which in turn requires the development of a strong financial sector. Moreover, the development of financial intermediaries will provide funds for private investment activity. The current account surplus may be improved if the investment climate is improved. This result is well-matched with a study done in the United States of America.

Furthermore, the interesting finding is that the growth rate of money supply has no effects on the current account in oil exporting countries, and negative effects in non-oil exporting countries. This implies that changes in the money supply base of the selected countries of MENA Region economy will impact differently in the current account. So the central banks of the non-oil exporting countries under study must try to monitor the supply of money in the economy. While there is no room for controlling the money supply in oil exporting countries, central banks do not have a role to play in order to resolve the current account problem.

8.2. Recommendations

From the findings of the study, the following recommendations are given**:**

(a) In case of oil exporting countries: If a government intends to resolve its "twin deficit" dilemma, it must begin by reducing its government budget deficit and this can be achieved by using fiscal adjustments which are essential for improving current account situations. Such a state needs appropriate fiscal adjustment measures that improve the tax collection system, rationalize the government spending by setting financial controls to avoid wasting public money, rationalize government subsidies and social benefits, and supervise the budgets of government departments and institutions for effective and productive financial control by various country's agencies and councils.

(b) In case of non-oil exporting countries: in order to solve the twin divergence problem, improving domestic savings and increasing the rate of private savings that requires the development of a strong financial sector will offer funds for private investment. The current account may be improved if the investment climate is improved. By implementing market modifications such as enhancing investment law and the governance may improve business environment and investment activity.

(c) Money supplies deteriorate the current account surpluses in case of non-oil exporting countries. This implies that changes in the money supply base of the selected countries' economies will influence significantly the inflation and so in the current account. Thus the central banks of those countries must endeavor to consciously monitor the supply of money in the economy and challenge the upcoming consequences that may come from an expected depreciation of the exchange rate.

(d) The results of this study cannot be generalized for similar economies or different time periods for the countries under study. If the oil prices continue to decrease, it's recommended to repeat this study again.

References

1) Alkaswani, M.A. (2000).” The Twin Deficits Phenomenon in Petroleum Economy: Evidence from Saudi Arabia”. Economic Research Forum, Conference Paper, No. 072000001.
2) Allen, P.R. (1972). ”Money and growth in open economies”. Review of Economic Studies, No. 39, pp. 213–219.
3) Azgun, S. (2012). “Twin Deficit Hypothesis: Evidence from Turkish Economy”**.** Doğuş Universities’ Dergisi, 13 (2) PP 189 – 196.
4) Baltagi, B. H. (2001) “Econometric Analysis of Panel Data”, John Wiley & Sons Ltd.
5) Barro, R.J. (1989). The Ricardian approach to budget deficits. Journal of Economic Perspectives, Vol.3 .No.2, pp.37-54.
6) Bartolini, L and Lahiri, A. (2006).”Twin Deficits, Twenty Years Later**”.** Current Issues in Economics and Finance ,Federal Reserve Bank of New York **,**Vol 12 ,no 7,PP 01-07.
7) Blanchard, O. J. (1985) “Debt, Deficits, and Finite Horizons”, Journal of Political Economy, VOL.93.NO.2, pp. 223.
8) Breusch, T., and Pagan, A. (1980). “The Lagrange multiplier test and its application model specification in econometrics”. Review of Economic Studies 47: 239–253.
9) Chang, J. and Hsu, Z. (2009) “Causality relationships between the twin deficits in regional economy”. National Chi Nan University, Department of Economics.
10) Calderon, C., Chong, A., Loayza, N. (2009).”Determinants of Current Account Deficit in Developing Countries” World Bank library- Latin America Regional Studies Program.
11) Constantinos, K, and Emmanouil, T. (2011).”Has the Accession of Greece in the EU Influenced the Dynamics of the Country’s “Twin Deficits?” An Empirical Investigation, European Research Studies, Vol, 14.NO.1, PP 45-54

12) Corsetti, G., and Muller, G. (2006**).** "Twin Deficits: Squaring Theory, Evidence and Common Sense". Economic Policy, PP 04 - 22.

13) Cuestas, J.C. and Harrision, B. (2008). "Testing for Stationarity of Inflation in central and eastern European countries". Nottingham Trent University, discussion paper in economics, No13, ISSN 1478-9396.

14) Cunado, J. and Gracia, F. P. d. (2005)." Current account and productivity: evidence for some European countries", Journal of Policy Modeling, Vol, 27, No.1, PP 75-89.

15) Drukker, D. (2003) "Testing for serial correlation in linear panel-data models"**.** The Stata Journal, Vol. 3, No. 2, pp. 168–177.

16) De Hoyos, E, Sarafidis, V, V. (2006)."Testing for cross-sectional dependence in panel-data models". The Stata Journal, the Stata Journal, Vol.6, No.4, pp. 482–496.

17) Dornbusch, R. (1976)."Expectations and Exchange Rate Dynamics". The Journal of Political Economy, Vol. 84, NO.6, pp. 1161-1176.

18)] Dwyer, J.A., Lewis,P.E.T. (1991)." The price effects of monetary changes: the case of a small open economy". Journal of Macroeconomics, No. 13, pp. 117–131.

19) Eldemerdash, H., Metclaf, H., Maioli, S. (2009). "Twin Deficits: New Evidence from an Arab World". ESDS, London.

20) Eldemerdash, H., Metclaf, H., Maioli, S. (2010). "Twin Deficits: New Evidence from a Developing Country Prospective". SSEM Euro-Conference, Turkey.

21) Enders, W. and Lee, B.-S. (1990) "Current Account and Budget Deficits: Twins or Distant Cousins?" .The Review of Economics and Statistics, Vol.72, NO.3, pp. 373-381.

22) Ener, M. and Arica, F. (2012)." The current account-interest rate relation: A panel data study for OECD countries" Journal of Business Management and Economics Vol. 3, NO.2, pp. 048-05.

23) Fisher, R. A. (1932). "Statistical Methods for Research Workers". 4th Edition, Edinburgh: Oliver & Boyd.

24) Fleming, J. M. (1962). "Domestic financial policies under fixed and under floating exchange rates". International Monetary Fund Staff Papers No. 10, pp: 369–380.

25) Gordon, J. (1986). "The American Business Cycle: Continuity and Change". National Bureau of Economic Research Studies in Business Cycles Series, Vol. 25, pp. xiv, 868. Chicago and London: University of Chicago Press.

26) Hsiao, C. (2003). "Analysis of Panel Data". Second Edition, Cambridge University Press, Cambridge.

27) Haug, A.A. (1996)." Blanchard's model of consumption: An empirical study". Journal of Business and Economics Statistics Vol.14, pp.169-177.

28) Housman, J. A. (1978)."Specification tests in econometrics". Econometrica, Vol.46, No.6, pp. 1251-1271.

29) Hoechle, D. (2007) "Robust Standard Errors for Panel Regressions with Cross-Sectional Dependence". The Stata Journal, Vol. 7, No. 3, pp. 281-312.

30) International Monitory Fund, accessed on April, 2015 from http://www.imf.org/en/Data

31) Kiran, B. (2011)." On the Twin Deficit Hypothesis: Evidence from Turkey**"**. Applied Econometrics and International Development Journal, Vol. 11, PP 60-66.

32) Kim,S. and Roubini,N. (2008) "Twin deficit or twin divergence? Fiscal policy, current account, and real exchange rate in the US ".Journal of International Economics, Vol.74, No.2, pp. 362–383.

33) Laney, L. O. (1984). "The Strong Dollar, the Current Account, and Federal Deficits: Cause and Effect". Federal Reserve Bank of Dallas Economic Review, pp. 1-14.

34) Levin, A., C. F. Lin, and C. Chu (2002): "Unit root tests in panel data: asymptotic and finite sample properties," Journal of Econometrics, Vol.108, pp.1-24.

35) Marinheiro, CF. (2008)" Ricardian equivalence, twin deficits, and the Feldstein–Horioka puzzle in Egypt". J Policy Model. doi:10.1016/j.jpolmod.2007.12.001

36) McKinnon, R. I. (1980)."Exchange Rate Instability, Trade Balance, and Monetary Policy in Japan, Europe, and the United States". Boston: Oriel Press Issues in International Economics, pp. 225-50.

37) Merza, E, Alwin, M and, Bashayreh, A. (2012)."The relationship between the current account and Government budget Balance: The case of Kuwait" .International Journal of Humanities and social science, Vol2, No.7, pp. 168-177.

38) Mohammad, S. (2010). "Impact of Money Supply on Current Account: Extent of Pakistan". European Journal of Scientific Research, Vol.41,No.2,pp. 314-322.

39) Mohammadi, H. (2004). "Budget Deficits and the Current Account Balance; new Evidence from Panel Data ". Journal of Economics & Finance, Vol.28, No.1, pp. 39-45.

40) Mohsen, B. (1989)."Effects of the US government budget on its current account: An empirical Inquiry". Quarterly Review of Economics and Business Vol 29, No.4, PP76-91.

41) Mundell, R. A. (1963). "Capital mobility and stabilization policy under fixed and Flexible exchange rates". Canadian Journal of Economics and Political Science, Vol.29, pp. 475–85.

42) Mosaddak, A. (2013)."The Twin Deficit in Morocco: An Empirical Investigation ".International Journal of Business and Social Research (IJSR), Vol 3,no 7, pp. 160 -172

43) Mudassar, K, Fakher, A and Sarwar, F. (2013)."Validation of Twin Deficit Hypothesis: A Case Study of Pakistan". Universal Journal of Management and Social sciences Vol 3, No.10, pp. 33 – 47.

44) Naeme, S. (2008)."Twin Deficit in Lebanon: A Time Series Analysis". American University of Beirut, Working Paper Series No. 2, pp. 20-25.

45) Organization of the Petroleum Exporting Countries (OPEC), accessed on January15, 2016 from: http://www.opec.org/opec_web/en/about_us/25.htm

46) Owoye, O. A. O. a. O. (2006) "An Empirical Investigation of Budget and Trade Deficits: The Case of Nigeria ". Journal of Developing Areas, Vol.39,No.2, pp. 153-174.

47) Piersanti, G. (2000)"Current Account Dynamics and Expected Future Budget Deficits: Some International Evidence", Journal of International Money and Finance, Vol19, No.2 pp. 255-271.

48) Puah, C, Lau, E and Tan, K (2006)."Budget-Current Account Nexus in Malaysia". .University of Malaysia, Faculty of Economics and Business.

49) Roberts, W.W. (1978). "Monetary expansion in an open economy of medium size, Economic record". No. 54, pp. 380–386.

50) Rotemberg, J.J. (1985). "Money and the terms of trade, Journal of International Economics". No. 19,pp. 141–160.

51) Sulikova, V, Sinikakova, M. and Horvath, D. (2014)."Twin Deficit in small open Baltic economies". Panoeconomicus, Vol 2, pp. 227 -239.

52) The Cooperation Council for the Arab States of the Gulf accessed on January,2016 from : http://www.gcc-sg.org/en-us/AboutGCC/MemberStates/Pages/Home.aspx.

53) The World Bank, accessed on March, 2015 from: http://www.worldbank.org

54) Tso, A.Y. (1988). "Monetary expansion, international trade, and capital accumulation". Economic Record, No. 64, pp. 113–119.

55) United Nations Conference for Trade and Development, accessed on November, 2015 from: http://unctad.org

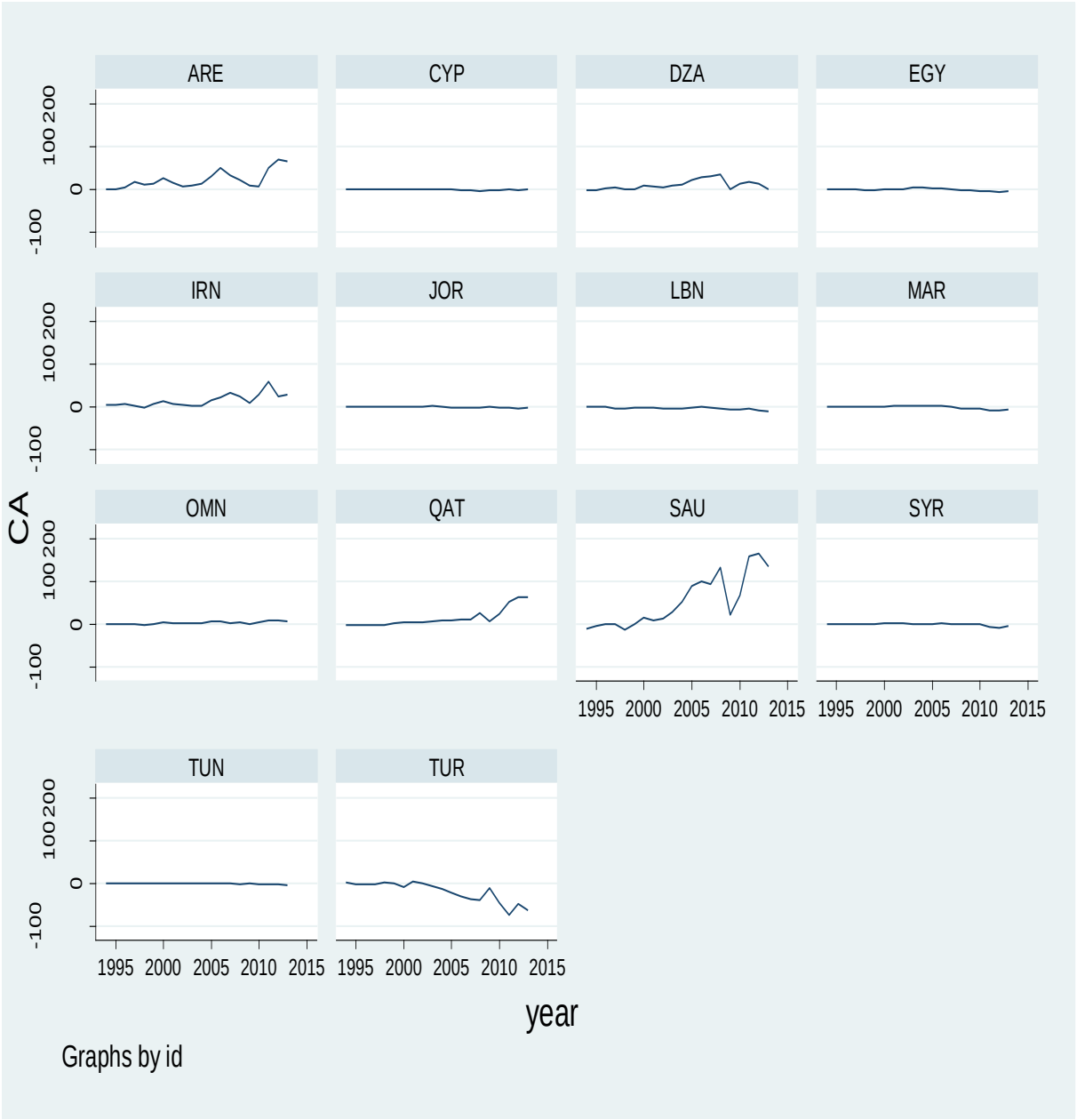
56) Vamvoukas, G. A. (1997) "Have large budget deficits caused increasing trade". Atlantic Economic Journal, Vol. 25, No.1, pp. 80.

57). Vyshnyak, O. (2000). “Twin Deficits Hypothesis: The Case of Ukraine‖. National University ”Kyiv -Mohyla Academy‖, MS thesis, Ukraine

58) Wooldridge, J. R. M. (2002).”Econometric analyses of cross section and panel data”. Cambridge, MA: MIT Press.

Appendix A

Figure A.1: Current Account (CA) in Current US Dollars (billions)



FigurevA. 2: Government Budget (GB) in Current US Dollars (billions)

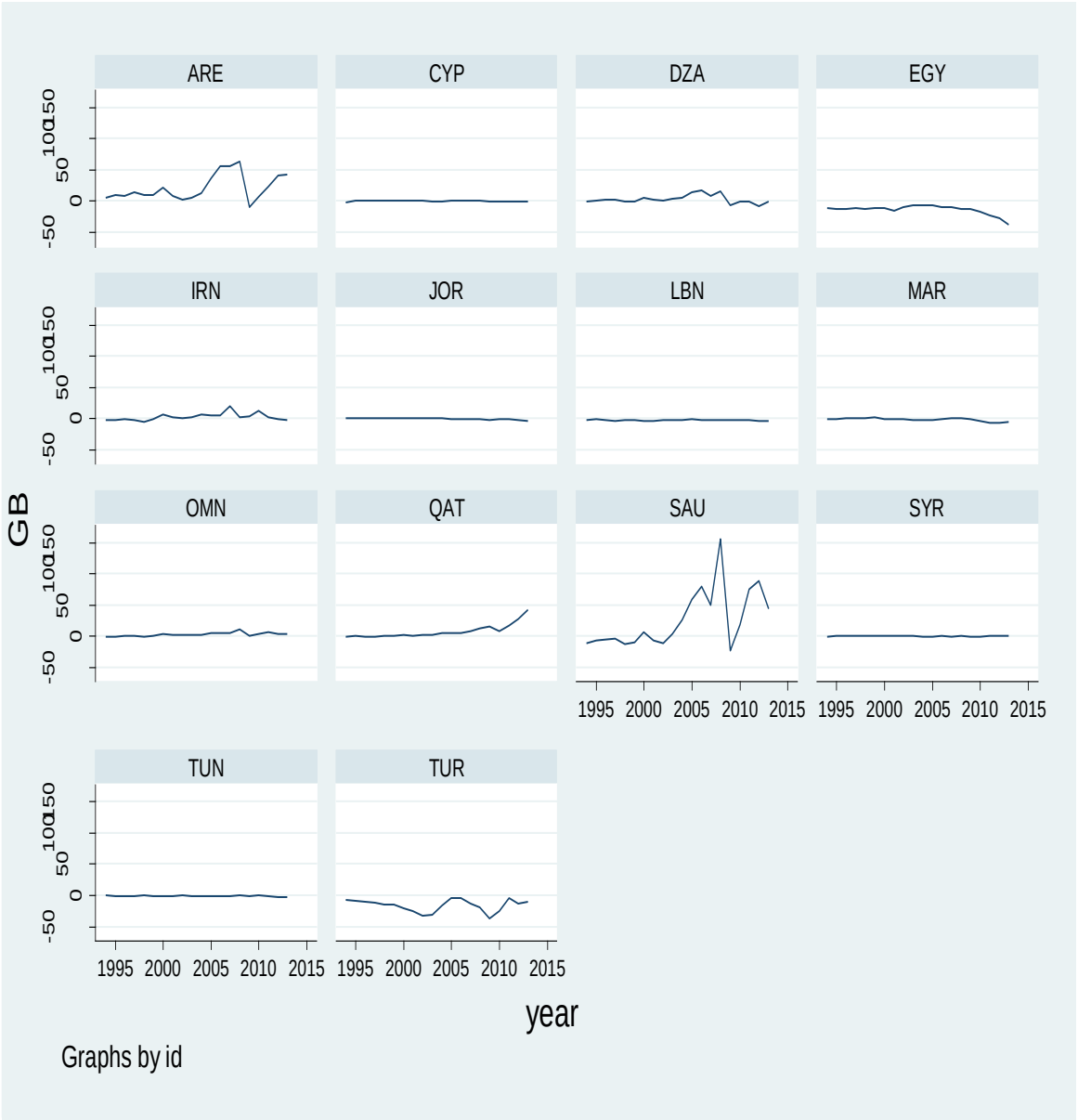
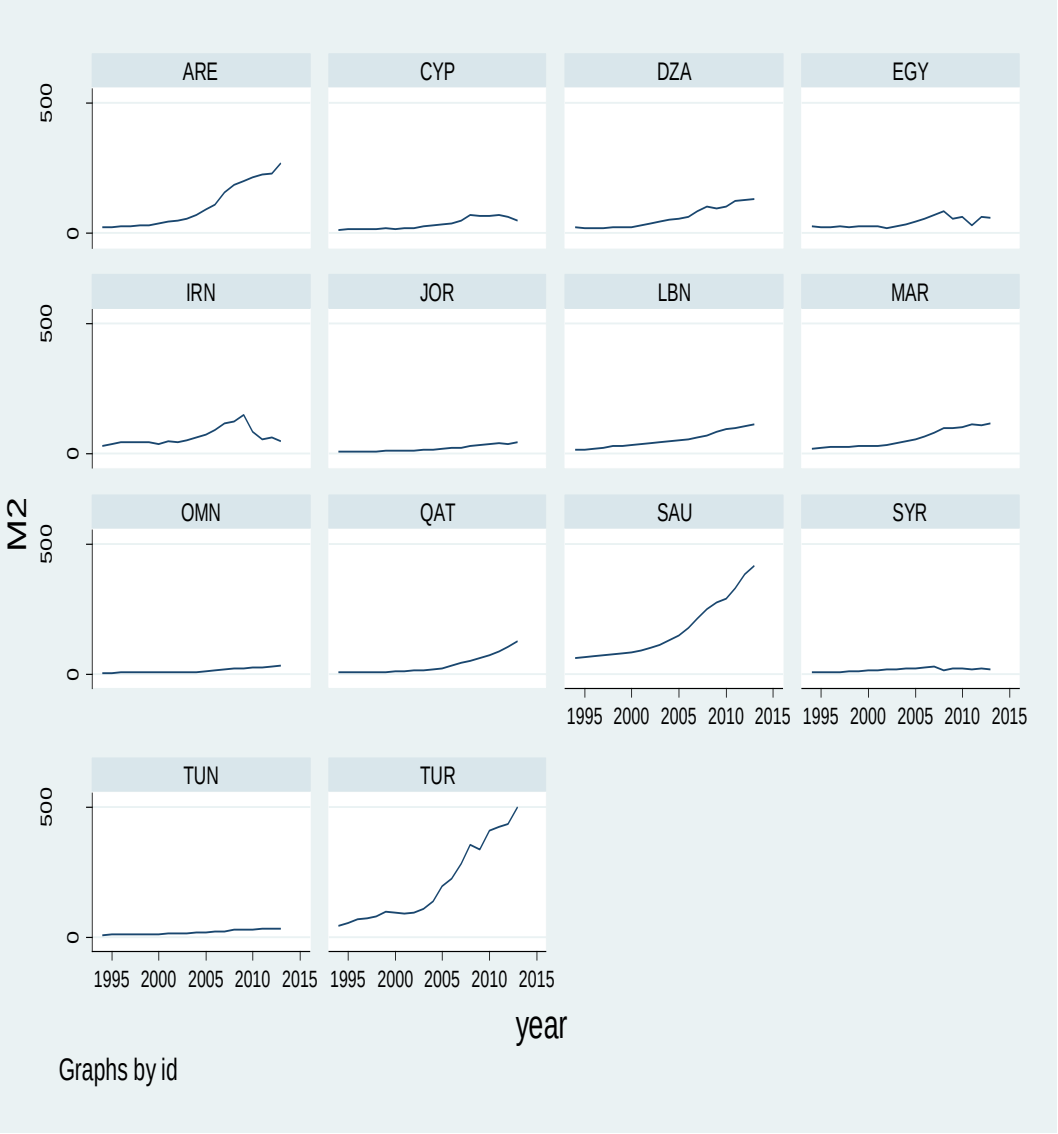


Figure A. 3: Saving-Investment Gap (SI) in Current US Dollars (billions)

Figure A.4: Money Supply (M_2) in Current US Dollars (billions)



Appendix B: Statistical Tables for Oil Exporting Countries

Table B.1: Fixed Effects Regression

```
Fixed-effects (within) regression               Number of obs      =       120
Group variable: id                              Number of groups   =         6

R-sq:  within  = 0.8813                         Obs per group: min =        20
       between = 0.8971                                        avg =      20.0
       overall = 0.8846                                        max =        20

                                                F(22,92)           =     31.04
corr(u_i, Xb)  = -0.0940                        Prob > F           =    0.0000
```

CA	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
GB	.7221938	.0747804	9.66	0.000	.5736735	.8707142
SI	.0870099	.0436061	2.00	0.049	.0004044	.1736154
M2	.143178	.0323701	4.42	0.000	.0788882	.2074678
d1994	5.736081	7.350003	0.78	0.437	-8.861659	20.33382
d1995	4.746601	7.284452	0.65	0.516	-9.720948	19.21415
d1996	6.533036	7.258638	0.90	0.370	-7.883246	20.94932
d1997	7.310481	7.236165	1.01	0.315	-7.061168	21.68213
d1998	5.290347	7.232079	0.73	0.466	-9.073185	19.65388
d1999	8.809714	7.21826	1.22	0.225	-5.526374	23.1458
d2000	10.22749	7.188862	1.42	0.158	-4.050213	24.50519
d2001	10.77459	7.113449	1.51	0.133	-3.353333	24.90252
d2002	9.617283	7.137288	1.35	0.181	-4.557987	23.79255
d2003	9.75587	7.042225	1.39	0.169	-4.230598	23.74234
d2004	8.608197	6.888122	1.25	0.215	-5.072208	22.2886
d2005	11.87292	6.752297	1.76	0.082	-1.537723	25.28357
d2006	11.28849	6.593544	1.71	0.090	-1.806859	24.38383
d2007	8.7388	6.50532	1.34	0.182	-4.181327	21.65893
d2008	(omitted)					
d2009	1.04939	7.151844	0.15	0.884	-13.15479	15.25357
d2010	8.214467	6.821516	1.20	0.232	-5.333652	21.76259
d2011	29.94108	6.663637	4.49	0.000	16.70652	43.17564
d2012	24.45718	6.584719	3.71	0.000	11.37936	37.535
d2013	16.66611	6.811287	2.45	0.016	3.138304	30.19391
_cons	-10.20701	5.939441	-1.72	0.089	-22.00325	1.589235
sigma_u	5.7193318					
sigma_e	10.914005					
rho	.21544859	(fraction of variance due to u_i)				

F test that all u_i=0: F(5, 92) = 5.09 Prob > F = 0.0004

Table B.2: Modified Wald test for groupwise heteroskedasticity

```
Modified Wald test for groupwise heteroskedasticity
in fixed effect regression model

H0: sigma(i)^2 = sigma^2 for all i

chi2 (6)  =       29.33
Prob>chi2 =      0.0001
```

TableB. 3: Wooldridge test

```
Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
    F(  1,       5) =      4.590
           Prob > F =      0.0850
```

Table B.4: Fixed Effect Regression with Robust Standard Errors

```
Fixed-effects (within) regression               Number of obs      =       120
Group variable: id                              Number of groups   =         6

R-sq:  within  = 0.8813                         Obs per group: min =        20
       between = 0.8971                                        avg =      20.0
       overall = 0.8846                                        max =        20

                                                F(5,5)             =         .
corr(u_i, Xb)  = -0.0940                        Prob > F           =         .

                                              (Std. Err. adjusted for 6 clusters in id)
```

CA	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
GB	.7221938	.0973988	7.41	0.001	.4718223	.9725654
SI	.0870099	.1471427	0.59	0.580	-.2912324	.4652522
M2	.143178	.0888425	1.61	0.168	-.085199	.3715549
d1994	5.736081	7.532842	0.76	0.481	-13.62771	25.09987
d1995	4.746601	8.117788	0.58	0.584	-16.12084	25.61404
d1996	6.533036	8.311239	0.79	0.467	-14.83168	27.89776
d1997	7.310481	8.189525	0.89	0.413	-13.74136	28.36233
d1998	5.290347	7.814289	0.68	0.528	-14.79692	25.37762
d1999	8.809714	8.329984	1.06	0.339	-12.60319	30.22262
d2000	10.22749	7.552397	1.35	0.234	-9.186567	29.64154
d2001	10.77459	9.277659	1.16	0.298	-13.07439	34.62357
d2002	9.617283	9.512867	1.01	0.358	-14.83632	34.07089
d2003	9.75587	9.990746	0.98	0.374	-15.92616	35.4379
d2004	8.608197	10.41023	0.83	0.446	-18.15214	35.36854
d2005	11.87292	9.853599	1.20	0.282	-13.45656	37.20241
d2006	11.28849	7.573617	1.49	0.196	-8.180114	30.75709
d2007	8.7388	8.324456	1.05	0.342	-12.6599	30.1375
d2008	(omitted)					
d2009	1.04939	10.63245	0.10	0.925	-26.28218	28.38096
d2010	8.214467	5.502642	1.49	0.196	-5.930525	22.35946
d2011	29.94108	13.02813	2.30	0.070	-3.548799	63.43096
d2012	24.45718	11.26835	2.17	0.082	-4.509041	53.4234
d2013	16.66611	11.79902	1.41	0.217	-13.66423	46.99645
_cons	-10.20701	11.20947	-0.91	0.404	-39.02187	18.60786
sigma_u	5.7193318					
sigma_e	10.914005					
rho	.21544859	(fraction of variance due to u_i)				

Appendix C: Statistical Tables for Non-Oil Exporting Countries

Table C.1: Fixed Effects Regression

Fixed-effects (within) regression — Number of obs = 160
Group variable: id — Number of groups = 8

R-sq: within = 0.8776 — Obs per group: min = 20
between = 0.8940 — avg = 20.0
overall = 0.8796 — max = 20

F(22,130) = 42.36
corr(u_i, Xb) = -0.2505 — Prob > F = 0.0000

CA	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
GB	-.2969564	.0655954	-4.53	0.000	-.4267291	-.1671837
SI	.1064918	.0212716	5.01	0.000	.0644085	.1485751
M2	-.1253447	.0066104	-18.96	0.000	-.1384226	-.1122669
d1994	1.69842	1.830709	0.93	0.355	-1.923419	5.320259
d1995	1.448296	1.830952	0.79	0.430	-2.174024	5.070615
d1996	1.821891	1.821826	1.00	0.319	-1.782373	5.426155
d1997	1.453949	1.81559	0.80	0.425	-2.13798	5.045877
d1998	1.825357	1.804303	1.01	0.314	-1.744241	5.394956
d1999	2.368267	1.79593	1.32	0.190	-1.184766	5.921299
d2000	1.043286	1.783854	0.58	0.560	-2.485856	4.572427
d2001	2.643993	1.768586	1.49	0.137	-.8549429	6.142929
d2002	2.204617	1.763609	1.25	0.214	-1.284472	5.693706
d2003	2.540788	1.757324	1.45	0.151	-.9358677	6.017444
d2004	3.075633	1.764312	1.74	0.084	-.4148475	6.566113
d2005	3.507248	1.75892	1.99	0.048	.027436	6.987061
d2006	3.547784	1.745323	2.03	0.044	.0948714	7.000696
d2007	3.601991	1.712933	2.10	0.037	.213157	6.990824
d2008	3.426309	1.684877	2.03	0.044	.0929814	6.759637
d2009	5.309672	1.66828	3.18	0.002	2.009179	8.610164
d2010	2.952893	1.665669	1.77	0.079	-.3424353	6.24822
d2011	-1.724731	1.673987	-1.03	0.305	-5.036513	1.587051
d2012	.2016133	1.660686	0.12	0.904	-3.083855	3.487081
d2013	(omitted)					
_cons	-.8405842	1.537442	-0.55	0.585	-3.88223	2.201061
sigma_u	2.3909647					
sigma_e	3.3167103					
rho	.34196427	(fraction of variance due to u_i)				

F test that all u_i=0: F(7, 130) = 7.35 — Prob > F = 0.0000

Table C.2: Modified Wald test for groupwise heteroskedasticity

Modified Wald test for groupwise heteroskedasticity
in fixed effect regression model

H0: sigma(i)^2 = sigma^2 for all i

chi2 (8) = 254.24
Prob>chi2 = 0.0000

Table C.3: Wooldridge test

```
Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
    F(  1,       7) =      11.718
           Prob > F =       0.0111
```

TableC.4: Regression with Driscoll-Kraay standard errors

```
Regression with Driscoll-Kraay standard errors   Number of obs      =       160
Method: Fixed-effects regression                 Number of groups   =         8
Group variable (i): id                           F( 23,     7)      =   1125.71
maximum lag: 2                                   Prob > F           =    0.0000
                                                 within R-squared   =    0.8776
```

CA	Coef.	Drisc/Kraay Std. Err.	t	P>|t|	[95% Conf.	Interval]
GB	-.2969564	.1536441	-1.93	0.095	-.6602669	.0663541
SI	.1064918	.0202525	5.26	0.001	.0586022	.1543814
M2	-.1253447	.008089	-15.50	0.000	-.1444721	-.1062174
d1994	.2501241	.0478852	5.22	0.001	.1368937	.3633546
d1995	(omitted)					
d1996	.373595	.0494343	7.56	0.000	.2567016	.4904885
d1997	.0056529	.0869842	0.06	0.950	-.200032	.2113377
d1998	.3770616	.1669707	2.26	0.058	-.0177613	.7718845
d1999	.919971	.1656388	5.55	0.001	.5282975	1.311645
d2000	-.4050101	.314174	-1.29	0.238	-1.147914	.3378935
d2001	1.195697	.4852895	2.46	0.043	.0481701	2.343225
d2002	.7563215	.5633842	1.34	0.221	-.5758705	2.088514
d2003	1.092493	.5089248	2.15	0.069	-.1109234	2.295908
d2004	1.627337	.2686922	6.06	0.001	.9919812	2.262693
d2005	2.058953	.2590069	7.95	0.000	1.446499	2.671407
d2006	2.099488	.3279585	6.40	0.000	1.32399	2.874987
d2007	2.153695	.5176051	4.16	0.004	.9297535	3.377636
d2008	1.978013	.7787343	2.54	0.039	.1365995	3.819427
d2009	3.861376	1.128235	3.42	0.011	1.193524	6.529228
d2010	1.504597	1.085245	1.39	0.208	-1.061601	4.070794
d2011	-3.173027	.9130552	-3.48	0.010	-5.332059	-1.013994
d2012	-1.246682	1.24993	-1.00	0.352	-4.202297	1.708932
d2013	-1.448296	1.417737	-1.02	0.341	-4.800712	1.90412
_cons	.6077115	.5826927	1.04	0.332	-.7701379	1.985561