

**DETERMINANTS OF CURRENT ACCOUNT DEFICITS IN INDUSTRIALIZED  
AND DEVELOPING COUNTRIES: AN EMPIRICAL INVESTIGATION**

**A THESIS SUBMITTED TO  
THE GRADUATE SCHOOL OF SOCIAL SCIENCES  
OF  
MIDDLE EAST TECHNICAL UNIVERSITY**

**BY**

**SEÇİL AYSED KAYA-BAHÇE**

**IN PARTIAL FULFILLMENT OF THE REQUIREMENTS  
FOR  
THE DEGREE OF DOCTOR OF PHILOSOPHY  
IN  
THE DEPARTMENT OF ECONOMICS**

**AUGUST 2005**

Approval of the Graduate School of Social Sciences

---

Prof. Dr. Sencer Ayata  
Director

I certify that this thesis satisfies all the requirements as a thesis for the degree of Doctor of Philosophy.

---

Prof. Dr. Erol akmak  
Head of Department

This is to certify that we have read this thesis and that in our opinion it is fully adequate, in scope and quality, as a thesis for the degree of Doctor of Philosophy.

---

Assoc. Prof. Dr. Erdal zmen  
Supervisor

Examining Committee Members

Dr. iğdem İzgi Koğar	(CBRT)	_____
Assoc.Prof. Dr. Erdal zmen	(METU)	_____
Prof. Dr. Erol Taymaz	(METU)	_____
Assist. Prof. Dr. Esmay Gaygısız	(CBRT)	_____
Dr. Mehtap Kesriyeli	(CBRT)	_____

**I hereby declare that all information in this document has been obtained and presented in accordance with academic rules and ethical conduct. I also declare that, as required by these rules and conduct, I have fully cited and referenced all material and results that are not original to this work.**

Name, Last name :

Signature :

## **ABSTRACT**

### **DETERMINANTS OF CURRENT ACCOUNT DEFICITS IN INDUSTRIALIZED AND DEVELOPING COUNTRIES: AN EMPIRICAL INVESTIGATION**

Kaya-Bahçe, Seçil Aysed

Ph.D., Department of Economics

Supervisor: Assoc. Prof. Dr. Erdal Özmen

August 2005, 178 pages

This study aims to analyze the determinants of the current account deficits for a broad samples of industrial and developing countries for the period 1984-2001. Using a dynamic panel data estimation procedure, we try to unfold the impact of several macro economic and institutional variables on current account deficits. In this context, we also examine the validity of Feldstein Horioka puzzle and its relevance to the current account imbalances. Results show that better governance, a more sophisticated financial system, relatively larger country size and deterioration in the terms of trade are associated with higher current account deficits. On the other hand, exchange rate regime flexibility, openness to foreign trade and depreciation of the real exchange rate lead to smaller current account deficits. We also find that the saving investment relationship is still considerably high both in the short run and in the long run.

**Keywords:** Current Account Deficit, Saving, Investment, Feldstein-Horioka, Governance

## ÖZ

### GELİŞMİŞ VE GELİŞMEKTE OLAN ÜLKELERDE CARİ İŞLEMLER AÇIĞININ BELİRLEYİCİLERİ: AMPİRİK BİR ARAŞTIRMA

Kaya-Bahçe, Seçil Aysed

Doktora, Ekonomi Bölümü

Tez Yöneticisi: Doç. Dr. Erdal Özmen

Ağustos 2005, 178 sayfa

Bu çalışma, sanayileşmiş ve gelişmekte olan ülkelerin 1984-2001 periyodunda cari işlemler açıklarının belirleyicilerini analiz etme amacını gütmektedir. Dinamik panel veri seti hesaplama yöntemini kullanarak, bazı makroekonomik ve kurumsal değişkenlerin cari işlemler açığı üzerindeki etkilerin ortaya koymaya çalıştık. Bu çerçevede ayrıca Feldstein-Horioka paradoksunun ampirik geçerliliğini ve cari işlemler açığıyla olan ilişkisini de araştırdık. Sonuçlar daha iyi yönetişimin, daha gelişkin bir finansal sistemin, görece büyük bir ekonominin ve aşınan ticaret hadlerinin daha yüksek cari işlemler açığına yol açtığını göstermektedir. Diğer taraftan, döviz kuru esnekliği, uluslar arası ticarete açıklık ve reel döviz kurunun aşınması daha düşük cari işlemler açığına yol açmaktadır. Sonuçlar, ayrıca, tasarruf yatırım ilişkisinin hem kısa hem de uzun dönemde yüksek olduğunu göstermektedir.

Anahtar Kelimeler: Cari İşlemler Açığı, Tasarruf, Yatırım, Feldstein-Horioka, Yönetişim

To my husband, Serdal

## **ACKNOWLEDGEMENTS**

I wish to express my deepest gratitude to my supervisor Assoc. Prof. Dr. Erdal Özmen for his guidance, advice, criticism, encouragements and insight throughout the research. I would also like to thank Prof. Dr. Erol Taymaz, Assist. Prof. Dr. Esma Gaygısız, Dr. Çiğdem İzgi Koğar and Dr. Mehtap Kesriyeli for their suggestions and valuable comments. I am indebted to my dear husband, Serdal Bahçe, for his patience, understanding and support during the course of this study. Without his help, support and encouragement it would have been impossible to complete this study. I owe a great deal to my parents Sedat Kaya and Aynur Kaya for their continuous support and unshakeable faith in me. Finally, I would like to thank to Yeşim Üçdoğruk as she shared all my difficult times at every stage of this study.

## TABLE OF CONTENTS

PLAGIARISM.....	iii
ABSTRACT.....	iv
ÖZ.....	v
DEDICATION.....	vi
ACKNOWLEDGEMENTS.....	vii
TABLE OF CONTENTS.....	viii
LIST OF TABLES.....	x
LIST OF FIGURES.....	xi
CHAPTER	
1. INTRODUCTION.....	1
2. CURRENT ACCOUNT BALANCE, SAVING AND INVESTMENT.....	8
2.1. Basic Concepts and Definitions.....	8
2.2. A Century of Capital Flows.....	12
3. EVOLVING VIEWS ON THE CURRENT ACCOUNT.....	17
3.1. Theoretical Models of the Intertemporal Approach to the Current Account.....	18
3.1.1. Neo-Classical Models of the Current Account.....	20
3.1.1.1. Deterministic Models of the Current Account.....	20
3.1.1.2. Stochastic Models of the Current Account.....	26
3.1.2. Post Keynesian Views on the Current Account.....	29
3.2. Empirical Evidence on the Dynamics of the Current Account.....	31
3.2.1. The Role of Investment.....	31
3.2.2. The Role of Savings.....	34
3.2.3. Twin Deficits Hypothesis.....	34
3.2.4. The Terms of Trade and the Current Account.....	35
3.2.5. Present Value Tests of the Current Account.....	37
3.2.6. Empirical Analysis of the Determinants of the Current Account.....	38

4. DETERMINANTS OF THE CURRENT ACCOUNT: A DESCRIPTIVE ANALYSIS.....	43
4.1. Current Account Balance.....	43
4.2. Determinants of the Current Account Deficits.....	58
4.2.1. Governance.....	58
4.2.2. Exchange Rate Regime.....	66
4.2.3. Capital Controls.....	71
4.2.4. Terms of Trade.....	74
4.2.5. Financial Deepening.....	76
4.2.6. Openness.....	79
5. MODEL, METHODOLOGY AND ESTIMATION RESULTS.....	82
5.1. The Model and the Data.....	82
5.2. Methodology.....	92
5.3. Estimation Results.....	94
5.4. Estimation Results with Additional Variables.....	100
6. THE FELDSTEIN HORIOKA PUZZLE REVISITED.....	103
6.1. Introduction.....	103
6.2. Literature Survey.....	104
6.3. Descriptive Analysis.....	109
6.4. Empirical Results.....	117
6.5. Long-Run Saving Investment Relationship.....	127
6.6. Concluding Remarks.....	133
7. CONCLUSION.....	135
REFERENCES.....	143
APPENDICES	
A. COUNTRY LIST AND CLASSIFICATIONS.....	155
B. CURRENT ACCOUNT BALANCE SERIES.....	158
C. EXCHANGE RATE REGIME CLASSIFICATIONS.....	166
D. TURKISH SUMMARY.....	170
VITA.....	178

## LIST OF TABLES

### TABLES

Table 4.1. Exchange Rate Regime Classification Codes.....	.67
Table 5.1. Simple Correlation Coefficients.....	.90
Table 5.2. Summary Statistics.....	91
Table 5.3. Estimation Results .....	.97
Table 5.4. Estimation Results with Additional Variables .....	.101
Table 6.1. Simple Correlation Coefficients.....	109
Table 6.2. Summary Statistics.....	109
Table 6.3. Investment and Current Account Balance. ....	118
Table 6.4. Investment and Current Account Balance for Sub-Samples.....	119
Table 6.5. Saving and Current Account Balance .....	119
Table 6.6. Saving and Current Account Balance for Sub-Samples .....	120
Table 6.7. Saving-Investment Correlation .....	120
Table 6.8. Saving Investment Correlation for Sub-Samples.....	121
Table 6.9. Saving Investment Correlation (EU Countries).....	122
Table 6.10. Saving Investment Relationship (Extended Model) .....	123
Table 6.11. Extended Model of Saving Investment Relationship for Different Sub-Samples .....	124
Table 6.12. Arellano Bond Estimation for Full Sample and Different Sub-Samples..	126
Table 6.13. Unit Root Tests for Individual Countries.....	127
Table 6.14. Saving Investment Coefficients .....	131
Table 6.15. Saving Investment Coefficients for Sub-Samples .....	131
Table 6.16. MG and CMG Estimators (Augmented Regression).....	132
Table C.1. Exchange Rate Regime Classifications.....	166

## LIST OF FIGURES

### FIGURES

Figure 4.1. Average Current Account Balance as % of GDP (Industrialized Countries).....	44
Figure 4.2. Average Current Account Balance as % of GDP (Transitional Economies).....	46
Figure 4.3. Average Current Account Balance as % of GDP (Latin American Countries).....	47
Figure 4.4. Average Current Account Balance as % of GDP (Sub-Saharan Countries).....	49
Figure 4.5. Average Current Account Balance as % of GDP (South-East Asian Countries).....	50
Figure 4.6. Average Current Account Balance as % of GDP (MENA Countries).....	51
Figure 4.7. Current Accounts Between and Within Countries (High-Income Countries).....	52
Figure 4.8. Current Accounts Between and Within Countries (Upper Middle Income Countries).....	53
Figure 4.9. Current Accounts Between and Within Countries (Lower Middle Income Countries).....	54
Figure 4.10. Current Accounts Between and Within Countries (Low Income Countries).....	54
Figure 4.11. Mean and Standard Deviation of Current Accounts (Developed Countries).....	55
Figure 4.12. Mean and Standard Deviation of Current Accounts (Developing Countries).....	56

Figure 4.13. Mean and Standard Deviation of Current Accounts (Least Developed Countries).....	56
Figure 4.14. Mean and Standard Deviation of Current Accounts (Indebted Countries) .....	57
Figure 4.15. Average Country Risk Score (Industrialized Countries).....	61
Figure 4.16. Average Country Risk Score (Latin American Countries) .....	62
Figure 4.17. Average Country Risk Score (Sub-Saharan Countries) .....	62
Figure 4.18. Average Country Risk Score (MENA Countries).....	63
Figure 4.19. Average Country Risk Score (South and East Asian Countries) .....	63
Figure 4.20. Within Data.....	64
Figure 4.21. Between Data.....	65
Figure 4.22. Overall Data.....	65
Figure 4.23. Exchange Rate Regime (Industrialized Countries).....	68
Figure 4.24. Exchange Rate Regime (Latin American Countries) .....	69
Figure 4.25. Exchange Rate Regime (Sub-Saharan Countries) .....	69
Figure 4.26. Exchange Rate Regime (MENA Countries).....	70
Figure 4.27. Exchange Rate Regime (South and East Asian Countries) .....	70
Figure 4.28. Capital Controls (High-Income Countries) .....	71
Figure 4.29. Capital Controls (Upper Middle Income Countries).....	72

Figure 4.30. Capital Controls (Lower Middle Income Countries).....	73
Figure 4.31. Capital Controls (Low Income Countries) .....	73
Figure 4.32. Terms of Trade (High-Income Countries) .....	74
Figure 4.33. Terms of Trade (Upper Middle Income Countries).....	75
Figure 4.34. Terms of Trade (Lower Middle Income Countries).....	75
Figure 4.35. Terms of Trade (Low Income Countries) .....	76
Figure 4.36. Financial Deepening (High-Income Countries) .....	77
Figure 4.37. Financial Deepening (Upper Middle Income Countries).....	77
Figure 4.38. Financial Deepening (Lower Middle Income Countries).....	78
Figure 4.39. Financial Deepening (Low Income Countries) .....	79
Figure 4.40. Openness (High-Income Countries) .....	80
Figure 4.41. Openness (Upper Middle Income Countries).....	80
Figure 4.42. Openness (Lower Middle Income Countries).....	81
Figure 4.43. Openness (Low Income Countries) .....	81
Figure 6.1. Pooled Data.....	110
Figure 6.2. Between Data.....	111
Figure 6.3. Within Data.....	112

Figure 6.4. Pooled Data (Saving-CAB) .....	112
Figure 6.5. Between Data (Saving-CAB) .....	113
Figure 6.6. Within Data (Saving-CAB) .....	114
Figure 6.7. Pooled Data (Investment-CAB).....	115
Figure 6.8. Between Data (Investment -CAB).....	115
Figure 6.9. Within Data (Investment -CAB).....	116
Figure B.1. Current Account Balance as % of GDP (Industrialized Countries).....	158
Figure B.2. Current Account Balance as % of GDP (Latin American Countries) .....	160
Figure B.3. Current Account Balance as % of GDP (Sub-Saharan Countries) .....	162
Figure B.4. Current Account Balance as % of GDP (MENA Countries).....	164
Figure B.5. Current Account Balance as % of GDP (South and East Asian Countries) .....	165

## **CHAPTER 1**

### **INTRODUCTION**

Contemporary economic world is more vulnerable to macroeconomic shocks than it was two decades ago. With the increasing speed of global transactions of commodities and capital, this vulnerability has created new priorities and generated new agendas for policy makers and international economic institutions. Free flow of capital and expanding world trade, establishing close linkages among national economies, reshaped the international economic relations. In such an environment, the external economic positions of countries gained importance for a better evaluation of the macroeconomic stance and the future growth prospects of national economies. Countries, as a result of increasing indebtedness and opening up of their financial markets, are exposed to several risks and have difficulties in accommodating external shocks. In other words, greater integration to the world economy brings some problems regarding the external economic positions of countries.

Beginning with 1970s, the international borrowing and lending started to accelerate and shape the external economic positions of countries. During the 1970s, this was in the form of recycling the huge oil surpluses of oil exporting countries to the international economic system. Most of the countries, even the developed ones, experienced large current account deficits. The following decade witnessed the increased debt ratios of less developed countries (LDCs). With opening of economies and the elimination of controls on trade and capital account balances, the international lending and borrowing increased even at an accelerating pace during the 1990s. The 1990s were a period of severe economic crises for the developing countries constrained by external indebtedness. Thus, the external economic positions of countries began to play a

prominent role both for the economic policy making of countries and in the agenda of international economic institutions. In this context, the current account balances of countries can be seen as an important indicator of the current and future economic situation of the countries. Hence, the determinants of the current account balances of countries deserve attention as the underlying factors are quite important for a sound evaluation of the current account position. The current account deficits of countries is no longer a by product of the foreign trade policies of countries. Rather, such imbalances started to be an important macro economic indicator; on the one hand, reflecting the capital account balance of countries, they serve as a source of finance for domestic capital formation and on the other hand, they indicate the degree of the vulnerability of the economy. Therefore, it is not an easy task to assess the current account imbalances of countries. For example Sachs (1981), just before the debt crises of early 1980s, argued that there is no need to worry about the current account deficits of the developing countries as these deficits reflect the increasing investment in these countries. However, the current account imbalances played a prominent role in the macro economic turbulence of the last two decades. Thus, assessing the current account balance and discussing its relevance as a sign of macro economic distress are quite important from the viewpoint of policy makers and international economic institutions. Hence, there is a need for a clear understanding of the determinants of the current account imbalances.

The objective of this study is to analyse the determinants of the current account deficits, depending on a large panel data set for the period 1984-2001. Our data set covers 76 countries including both developed and developing ones. Despite the extensive body of theoretical literature, there are few empirical studies on the determinants of the current account balance (Debelle and Faruqee, 1996, Calderon *et al.*, 2002, Chinn and Prasad, 2003, Özmen, 2005). Our study differs from the previous research on the grounds that we mainly stress the role of institutional and macroeconomic determinants of the current account deficits. In this context, we incorporate the impact of institutional quality, exchange rate regime adopted and the level of financial development etc. into the analysis of the current account deficits. Institutional quality seems to be quite important in the sense that better governance can increase the ability to sustain higher current account deficits. On the one hand, better

governance and strong institutional set up provide an environment conducive to increasing domestic investment and, on the other hand, promote foreign direct investment. Moreover, strong institutions lead to a decline in the equity home bias abroad (Ahearne *et al.*, 2004). Hence, we expect that better governance, by facilitating increased investment and higher capital inflows, has a positive impact on the current account deficits. On the other hand, the exchange rate flexibility is quite relevant as far as the capacity of countries to accommodate external shocks considered. Countries with relatively flexible exchange rate regimes can better accommodate external shocks (Edwards, 2004). Flexible exchange rate regimes allow exchange rates to adjust in case of any current account deficit disequilibrium and act as a disciplining device on the current account deficits. Thus, we expect that relatively more flexible exchange rate regimes are associated with lower current account deficits. On the other hand, according to the equity home bias view, country size proxied by the log of GDP leads to smaller current account deficits as, in relatively larger economies, important part of the domestic savings is retained in the home country in order to finance domestic capital formation. Relatively more sophisticated financial structures, relaxing the borrowing constraints, results in widening current account deficits. Therefore, we expect that the level of financial deepening is positively related to the current account deficits. We also introduce a set of variables widely used in the previous literature as determinants of the current account deficits like openness, capital controls, real exchange rate and the terms of trade. On the other hand, capital controls, limiting the inflow of foreign savings can lead to smaller current account deficits. This study diverges from the previous research, by first introducing governance, exchange rate flexibility and country size as determinants of the current account deficits in a panel data setting. Hence, the main contribution of this study is, drawing on a broad panel data set, we incorporate governance, exchange rate regime and country size into the analysis of the determinants of the current account deficits.

While evaluating the current account deficits, one should also examine the relation between saving and investment as the current account balance demonstrates the saving investment gap. As the current account balance is an expression of domestic saving-investment gap, the correlation between saving and investment is very crucial for

current account performance. High capital mobility is supposed to weaken the correlation between national saving and domestic investment in the sense that the availability of international investment funds tends to undermine the saving constraint upon domestic investment. However, seminal study of Feldstein and Horioka (1980) shows that the saving retention rate was not as low as theory predicts. Henceforth, strong correlation between saving and investment rates in a high capital mobility environment (also known as Feldstein-Horioka puzzle) has been one of the six major puzzles in macroeconomics (Obstfeld and Rogoff, 2000). This puzzle indicates that, even in the case of high net capital inflows, a high proportion of domestic savings is retained in the home country to finance domestic investment. The Feldstein-Horioka puzzle paved the way for a new branch of literature which has concentrated upon the short and long-run relations between saving, investment and current account balance. Hence, the saving investment correlation (Feldstein-Horioka puzzle) deserves an empirical interrogation. In this study, we aim to test the Feldstein-Horioka puzzle concerning short- and long-run relation between saving and investment using our data set covering 76 countries.

Chapter 2 begins with basic concepts and definitions regarding the current account balance, saving and investment. The current account balance, representing the gap between domestic saving and investment, is highly related to the latter variables. The correlation between domestic saving and investment has important implications regarding the current account deficits. On the other hand, interpreting the correlation between saving and investment and its link with the current account balance depends on the degree of capital mobility. The capacity of countries to run large current account imbalances is closely related to the conjuncture of the international financial system in the sense that countries can run huge current account deficits in periods of free capital mobility while they have to rely on domestic financing when capital is relatively immobile. Such systemic and conjunctural features of capital flows have important repercussions on current account balances of countries. Thus, in Chapter 2, we also provide a brief history of capital flows during the last century.

There is a broad literature on the dynamics of current account balances. Early studies focused on the net exports component of the current account balance and examined the determinants of the trade balance. Beginning with 1980s, a body of

literature, which views the current account balance as the outcome of the intertemporal saving and investment decisions of agents, developed. Therefore, Chapter 3 surveys the main theoretical and empirical studies analyzing the dynamics of the current account balance. Before examining these intertemporal open economy models, we start with an analysis of the traditional Mundell-Fleming open economy model with its implications in terms of the current account and external imbalances. We begin with a survey of theoretical open economy models which explore the dynamics of the current account in an intertemporal framework. These models include some deterministic models with perfect foresight assumption and proceed with the stochastic models which incorporate uncertainty about the economic environment. Among the deterministic open economy models, the finite horizon overlapping-generations models introduce the heterogeneity among agents by abolishing the representative agent assumption. Lastly, we discuss the Post Keynesian views on the current account imbalances. Chapter 3 also explores the empirical evidence on the dynamics of current account balance. This chapter concentrates upon various channels through which current account performance is determined. In this context, we will review several studies which examine the impact of different factors through investment, savings, budget balance and terms of trade upon the current account balance. We also mention about some studies on the present value tests of the current account. Then, we will give a brief summary of the studies that examine the dynamics of the current account using panel data approach.

Chapter 4 gives the descriptive analysis of the variables that we use in order to explain current account dynamics. Chapter 5 outlines our model, methodology and data, and covers statistical properties of current account deficits and explanatory variables. We use Arellano-Bond dynamic panel data estimation technique which controls for joint endogeneity of the explanatory variables (Arellano and Bond, 1991 and Arellano and Bover, 1995). Our data are taken from the World Bank World Development Indicators and IMF's Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER). The data for the exchange rate regimes are from Reinhart and Rogoff (2004).

In Chapter 6, we examine the validity of the Feldstein-Horioka puzzle. In neoclassical theory, investment depends on the marginal product of capital. On the other

hand, changes in the saving rates rest on a broad set of factors including institutional and legal framework, demographics, income growth, tax and social security structure and financial structure of the economy. Hence, factors underlying the saving behavior in an economy are completely different from the determinants of investment. Thus, theory does not predict a close correlation between saving and investment. However, the former is supposed to be related to the current account balance with a coefficient close to one. In other words, since the theory predicts that the increase in saving has no effect on investment, it should lead to a one-to-one increase in the current account (Ventura, 2002). In the same manner, since change in investment does not theoretically have impact on saving, the coefficient of the correlation between the current account and investment is supposed to be close to -1. Thus, examining the correlation between the current account and saving and investment provides strong implications regarding the Feldstein-Horioka puzzle. Strong current account-investment and current account-saving correlations imply a considerably weak correlation between saving and investment. Hence, we analyze the relationship between the current account and saving and investment in order to observe whether there is strong correlations between the current account and saving and investment. We expect that the saving investment correlation is still considerably high especially in the long run and current account-investment and current account-saving correlations are significantly smaller than what the theory predicts. We look for the relationship between investment and saving both in the short run and in the long run using cross section, mean group and cross sectional mean group estimation methods. Moreover, our study differs from previous research by incorporating additional variables used in current account models and estimating extended models of investment-saving correlation both in the long run and in the short run. Among these variables are governance, exchange rate regime, financial deepening, openness and capital controls index. Institutional setup is quite relevant in the context of saving investment relationship as better institutions, on the one hand, lead to the retention of domestic saving within the country and, on the other hand, attract foreign savings in the form of capital inflows. In the same manner, a more sophisticated financial system results in higher levels of investment. We expect that openness is positively related to investment rate as openness to foreign trade leads to higher

investment opportunities. Capital controls, leading to the retention of domestic savings, can result in stronger saving investment correlation. On the other hand, we expect that relatively ore flexible exchange rate regimes, being more vulnerable to exchange rate risk, are associated with lower investment rates.

Chapter 7 presents some concluding remarks. There is also a need for a discussion of the relevance of the current account in policy making process. In chapter 7, we also focus on whether there is a scope for policy action as far as the current account deficits are considered stressing relation of such imbalances with budget deficits.

## CHAPTER 2

### CURRENT ACCOUNT BALANCE, SAVING AND INVESTMENT

In this chapter, we provide basic concepts and definitions of the current account balance, saving and investment in order to explore the link between these variables. As the current account balance shows the gap between domestic saving and investment, the latter variables and the correlation between them are quite relevant in the context of the current account balance. On the other hand, current account balance also shows foreign savings and thus highly related to the capital inflows. Capital inflows, supplying foreign savings, relax the resource constraint to finance domestic investment. Moreover, the assumption about the capital mobility is highly important while evaluating the current account deficits and interpreting the correlation between national saving and domestic investment. Hence, we give a brief history of capital flows in the second part of this chapter.

#### 2.1. Basic Concepts and Definitions

It is also important how we define the current account balance. In the following equation, current account is the sum of net exports, net income transfers from abroad including interest payments and net unrequited transfers such as aid. In equation 1, X is exports, M is imports, NFI is net income transfers from abroad and NTR is net unrequited transfers.

$$CA = X - M + NFI + NTr \quad (1)$$

On the other hand, the current account balance can also be thought as the part of national income that is not consumed domestically. GDP is the gross domestic product which is a sum of consumption, investment government expenditure and net exports.

GNDI is the gross national disposable income which can be found by adding NFI and NTR to GDP. The part of GNDI that is not spent on consumption, investment or government expenditure is the current account surplus of that country. On the other hand, if the country spends in excess of its GNDI, that country runs current account deficit.

$$\text{GDP} = \text{C} + \text{I} + \text{G} + \text{X} - \text{M}$$

$$\text{GNDI} = \text{GDP} + \text{NFI} + \text{NTR}$$

$$\text{CA} = \text{GNDI} - (\text{C} + \text{I} + \text{G}) \quad (2)$$

The current account balance can also be thought as the difference between national saving and domestic investment. GNDI is either spent for private and public consumption or saved. In equation 3, current account is the sum of public and private saving in excess of domestic investment. The current account can also be defined as the change in net foreign assets of the net foreign asset accumulation. Investment is financed either by national saving or by foreign saving where the latter is the current account deficit or -CA.

$$\text{GNDI} = \text{C} + \text{G} + \text{S}_p + \text{S}_g$$

$$\text{C} + \text{G} + \text{S}_p + \text{S}_g = \text{C} + \text{I} + \text{G} + \text{X} - \text{M} + \text{NFI} + \text{NTR}$$

Rearranging the terms;

$$\text{X} - \text{M} + \text{NFI} + \text{NTR} = \text{S}_p + \text{S}_g - (\text{I}_p + \text{I}_g)$$

$$\text{CA} = \text{S} - \text{I} \quad (3)$$

$$\text{CA} = \text{Net Foreign Asset Accumulation} \quad (4)$$

After defining the current account balance, we can ask what determines the current account balance and why current account balances differ within and between countries. According to the intertemporal approach, the current account depends on the forward looking dynamic saving and investment decisions of economic agents. Equation 3 shows that the current account is the difference between domestic saving and investment. Hence, in order to explain what determines the current account one should analyse the determinants of saving and investment.

There are some institutional factors underlying the cross country differences in saving rates such as tax policies, social security systems, demographic structures etc. For example, high income taxes induce people to save less as their disposable income

declines. Moreover, if there is a firm social security system guarantying their older times, people would be inclined to save less. If the ratio of working age population is low, saving rate will also be low. On the other hand, countries may face with transitory income shocks and use their savings in order to smooth consumption. As the consumption smoothing preferences vary across countries, saving rates also differ from country to country. If we assume that a country' wealth is composed of domestic capital stock (K) and its net foreign assets (F), an increase in saving leads to a rise in wealth which is either invested in domestic capital or lent to foreigners. We call the change in domestic capital stock as investment (I) and the change in net foreign asset position as the current account balance (CA). However, in neoclassical theory, investment depends on the marginal product of capital and wealth does not have any impact on investment while it affects savings. Hence, the determinants of saving differ from the determinants of investment. While the variations in saving rates depends on consumption smoothing and some institutional factors, variations in investment rates can be explained by productivity and the growth rate of population. For example, following an adverse income shock, savings decline with no change in investment and a rise in foreign borrowing in order to smooth consumption. In the same manner, the higher a country's wealth larger will be the change in its net foreign asset position. Therefore, we expect a high correlation between savings and the current account. On the other hand, as the theory predicts that the change in wealth does not have an impact on investment, we do not expect a strong relationship between saving and investment.

Empirical studies which use the historical data show a strong correlation between saving and investment and low correlation between current account and saving (Ventura, 2003). In their well-known study, Feldstein and Horioka (1980) found a high correlation between saving and investment. Following the finding of Feldstein and Horioka, the saving investment correlation became one of the puzzles in international macroeconomics (Obstfeld and Rogoff, 2000). What is puzzling here is that saving and investment rates seem to be highly correlated across countries although the theory predicts no relationship between these two variables under perfect capital mobility.

If capital is perfectly mobile across countries, we expect a low correlation between saving and investment. In such an environment, domestic investment is

financed by foreign savings, which is simply the current account deficit, when the national saving is deficient. Hence, it is also important to examine the correlation between saving and current account on the one hand and investment and current account on the other. If the saving investment correlation is low, any increase in domestic investment should be accompanied by higher foreign savings. In the same manner, higher domestic savings, relaxing the financing constraints on the domestic investment, can lead to the lower level of current account deficits. Ventura (2003) finds a strong relationship between saving and investment and a low correlation between saving and the current account. In the same way the relationship between investment and the current account also seems to be quite low especially in the long run. Ventura (2003) also checks for some common shocks that may have an effect both on saving and investment. However, the strong saving investment correlation remains intact even when such common shocks are controlled. Ventura includes the investment risk and the adjustment costs to the basic theory of the current account. According to the basic theory of the current account, economic agents, aiming at maximizing returns, invest up to the point that the marginal product of capital is equal to the interest rate. The law of diminishing returns implies that the marginal product of capital declines as investment increases. However, investors face a trade off between maximizing the return to their portfolio and minimizing its risk. In fact, individual investors invest up to the point that the marginal product of capital is equal to the interest rate plus a risk premium. Risk premium is determined by the share of domestic capital in total wealth, that is, investment risk increases as domestic capital constitutes a larger part of the total wealth. Thus, wealth has an effect on investment through investment risk. However, if the diminishing returns are strong and the investment risk is weak, domestic capital stock is mainly determined by the capital labour ratio and wealth does not have an effect on investment. On the other hand, if the diminishing returns are weak and the investment risk is strong, the marginal product of capital no longer depends only on the capital labour ratio; the wealth effect can not be negligible.

Ventura (2003) finds that the correlation between investment and the current account seems to be higher in the short run. However, the observed correlation totally disappears in the long run. Such a discrepancy stems from the portfolio choice of

countries. Following an increase in wealth, countries may go to portfolio growth or portfolio rebalancing. In the former, countries invest either in domestic capital or in foreign assets in the same way as before without changing the composition of their portfolio. On the other hand, the latter implies a change in the structure of the country portfolio. In the short run, countries rebalance their portfolios due to the existence of adjustment costs. However, in the long run, any change in wealth generates portfolio growth with no change in the composition of it.

At this point, how countries choose their portfolio becomes important in the sense that country portfolios are strongly associated with the current account dynamics. First of all, minimizing the risk associated with investment is important as much as maximizing return to investment. In neoclassical theory, investment depends on the real interest rate and the marginal productivity of capital. Agents invest up to the point where marginal productivity of investment is equal to the interest rate. As far as a small economy which does not affect the world interest rate considered, the marginal productivity of capital remains as the only determinant of investment. However, investors also take the investment risk into account. In other words, minimizing the risk associated with investment play an important role in decisions of the investors. Second, there is equity home bias in international trade meaning that investors are inclined to invest domestically. There are several explanations of the equity home bias such as transaction costs or country size (Lewis, 1999 and Obstfeld and Rogoff, 2000). Finally, the assumption of perfect substitutability of domestic and foreign assets is not valid since there are informational asymmetries underlying the flow of funds outside the country (Ahearne et al., 2004).

## **2.2. A century of Capital flows**

The international capital mobility can be seen as an engine of growth or a source of instability (Eichengreen, 2003). According to the former view, international capital mobility supplies the countries with a stream of resources necessary for domestic capital formation in case of a domestic financing constraint. In such a way, if domestic savings fall short of domestic capital formation, international capital flows relax the resource constraints and contribute to financing domestic capital formation. On the other hand,

capital flows, especially those in the form of foreign direct investment, set the stage for technology transfers and knowledge spillovers. The latter view that perceives capital flows as a source of instability emphasizes the volatility and crises prone nature of capital flows. Capital flows can suddenly come to a halt leading to macroeconomic instability and even crises (Calvo *et al.*, 2003, 2004). Countries try to minimize the risks associated with capital flows by strengthening institutional structure. However, such risks can never be fully avoided and capital flows always contain some kind of uncertainty.

From one point of view, large current account deficits of countries, reflecting capital inflows that reinforce domestic savings in the form of foreign saving, can be seen conducive to growth as far as they finance domestic capital formation. However, such current account imbalances involve several risks associated with the volatility and crisis prone nature of capital flows. Hence, capital inflows put binding constraints for investment and growth as they are subject to reversals. On the other hand, the capacity of countries to run large current account imbalances is closely related to the conjuncture of the international financial system in the sense that countries can run huge current account deficits in periods of free capital mobility while they have to rely on domestic financing when capital is relatively immobile. Such systemic and conjunctural features of capital flows have important repercussions on current account balances of countries. Thus, we give a brief history of the international capital mobility in the 20<sup>th</sup> century<sup>1</sup>.

The 20<sup>th</sup> century can be divided into four phases in terms of international economic structure and capital mobility among nations. The first phase, which dates to the last decades of 19<sup>th</sup> century and early 20<sup>th</sup> century until World War I, witnessed unfettered capital mobility among nations. Eichengreen (2003) states that the increase in international capital mobility has certain characteristics in terms of the macroeconomic conditions of their period. First of all, higher capital mobility coexisted with the upswing of global business cycles. Second, the international flow of funds increased in a period of expanding world trade. Third, higher capital mobility took place under supportive political conditions and lastly, financial innovations accommodated the free flow of funds among nations (Eichengreen, 2003). The high amount of capital mobility, which

---

<sup>1</sup> For an historical analysis of the current accounts and capital mobility, see Taylor (2002)

took place during the prevailing years of World War I, was associated with these economic conditions. There was an investment boom outside Europe, especially in America and Canada, totally financed by capital flows from Europe (Cameron, 1993). The leading capital exporters in this era were England and France; they were followed by Germany (Cameron, 1993:288-289). Such an investment boom stemmed from the needs for infrastructure at the overseas settlements of Europe. The flow of slave labor from Africa and the flow of capital from Europe contributed to the increasing mobility of resources. The combination these flows of labor and capital with the natural resource endowments culminated in a huge volume of production. This production flooded to Europe and contributed to the expansion of world trade. International monetary system was in the form of gold standard which rested upon gold as the international reserve asset and, in such a system, the value of gold was fixed in terms of the other currencies specified by countries. Gold standard assured credibility and stability which supported the increasing volume of capital flows. As Eichengreen indicates; international cooperation guaranteed credibility and sustainability of gold standard (Eichengreen, 1992). However, international capital mobility and expansion of world trade came to a halt with the outbreak of World War I.

The second phase of the 20<sup>th</sup> century coincided with the interwar period, which began with the end of World War I and ended at the time of Great Depression. This was a transition period with relatively smaller capital flows. The most prominent capital exporter in this era was USA and the basic aim of exporting capital, mainly to European countries, was reconstruction of devastated European economies (Eichengreen, 1992). The interwar period witnessed a resurgence of classical gold standard however; the gold standard during the interwar period was not credible nor ensured stability as its pre-war counterpart. The post-war economic and political environment and the lack of international cooperation detracted the credibility and stability of the interwar gold standard. During the 1920s, there was an expansion of trade, global growth and increasing volume of capital flows, however, the economic situation was far beyond that of its pre-war counterpart and the Great Depression reversed the economic environment and led to the collapse of the capital markets. Thus, the interwar gold standard was

relatively short lived, preceded by a world war and ended with the greatest economic collapse of the century.

The third phase began with the end of World War II and lasted up until the 1970s. The Bretton-Woods system, which dominated the international monetary system of the period, produced the two institutions, the International Monetary Fund and the International Bank of Reconstruction and Development, now known as the World Bank. These institutions, especially the IMF, had a prominent role in regulating the international economic settlements. The exchange rate stability was pursued by pegging all the currencies to the dollar which was already pegged to 1/35 of an ounce of gold. The Bretton Woods system aimed at regulating international payments and avoiding payments imbalances by guaranteeing the exchange rate stability. This was a period of tight restrictions on capital mobility and the trade balances dominated the current account balances of countries.

The fourth phase started with the collapse of the Bretton Woods system, which paved the way for a transition from fixed to flexible exchange rates. With the delinking of the dollar gold parity, there remained no anchor for the value of the dollar. On the other hand, the two oil shocks that took place during the 1970s had devastating effects on the current account balances and balance of payments of countries. The export revenues of OPEC countries have been recycled into the international financial system in the form of bank loans. Huge increases in the current account surpluses of these countries coexisted with the widening current account imbalances of oil importing countries. The declining interest rates as a result of the excess supply of funds led to the outburst of international lending. Net capital inflows to developing countries increased nominally by more than twenty-fold in the 1970s (Akyüz and Cornford, 1999).

The 1980s witnessed a series of debt crises in the developing world. The recession in the OECD countries set the stage for enormous declines in the exports of the developing countries. On the other hand, rising interest rates pushed them into debt service difficulties and as the cost of borrowing increased, access to foreign finance became even harder. Therefore, in this period, total capital inflows were relatively lower compared to the 1990s and the 1970s (Bosworth and Collins, 1999).

The international capital mobility displayed an enormous increasing trend during the 1990s (Bosworth and Collins, 1999).<sup>2</sup> Increasing export revenues of the developing countries relaxed the constraints on debt servicing. Moreover, development of financial markets made the access to foreign finance relatively easier. However, economic crises continued to occur even more severely in scope and duration. The economic crises in 1990s differed from those of the past decade in terms of their type and contagion effects. The economic crises during 1980s generally stemmed from the current account imbalances and high levels of sovereign debt. However, the crises of 1990s mainly derive from capital account balances which embody some kind of instability and volatility involved in the nature of capital flows (Gabriele, Boratav and Parikh, 2000). On the other hand, the economic crises of this period easily contaminated through the economies via financial markets.

---

<sup>2</sup> For example, Bosworth and Collins show that, total amount of capital inflows to 58 developing countries rose from 24 billion dollars in the 1982-89 period to 135 billion dollars in the 1990-1995 period (Bosworth and Collins, 1999:31). Akyüz and Cornford indicate that total capital inflow to developing countries as a percentage of GNP was 4.91% in the 1975-1982 period, 2.87% in the 1983-1989 period and 5% in the 1990-1998 period (Akyüz and Cornford, 1999:9). For the whole 1975-1998 period, Latin America and East Asia captured the highest share.

## CHAPTER 3

### EVOLVING VIEWS ON THE CURRENT ACCOUNT

In the post World War II period, the prevailing view on the current account was the elasticities approach, which rests upon the idea that the current account is mainly determined by the trade balance of the countries. Models based on elasticities approach depend on the export and import demand equations. According to the elasticities approach, the current account behaviour is driven by the changes in net exports; therefore, it is important to emphasize the role of relative price changes on trade flows. Hence, most of the studies focused on the relationship between the terms of trade changes and the current account (Harberger, 1950 and Laursen and Metzler, 1950). This was particularly important for developing country industrialization policies in the sense that, deterioration in the terms of trade ratios of these countries which export primary goods and import capital goods results in worsening current account positions and constraints these countries' ability to grow. Industrialization policies based on this view proposed industrialization through import substitution in developing countries. However, during the oil price shocks of 1970s, most countries (including the developed countries) experienced large fluctuations in their current account positions. Huge current account deficits even in the industrialized countries stressed that the current account is not only determined by trade flows but also capital flows which is a way of external financing in the form of foreign borrowing for countries. As a result, there is a shift from trade flows approach to the view which takes the current account as the difference between national saving and domestic investment.

In the early 1980s, some studies examined the current account as an intertemporal phenomenon. These studies argued that the current account has an intertemporal dimension as both the saving and investment decisions depend on intertemporal factors. Lucas's critique (Lucas, 1976) of the econometric policy evaluation gave way to the development of the intertemporal models of the current account. According to the intertemporal approach, the current account balance results from the forward looking dynamic saving and investment decisions of economic agents which depend on the optimization problem of firms and households. Utility maximizing agents smooth consumption in an intertemporal framework (Sachs, 1981 and Obstfeld and Rogoff, 1995). Consumption smoothing implies that agents optimize consumption levels depending on a dynamic budget constraint. In this way, agents are not forced to decrease investment in case of deficient domestic savings; instead, they rely on external funds to meet the domestic investment opportunities. In other words, the intertemporal budget constraints allow them to smooth consumption between periods; borrowing at times of investment booms that surpass the national savings and lending when the domestic savings are abundant.

### **3.1. Theoretical Models of the Intertemporal Approach to the Current Account**

The traditional Mundell-Fleming model (Fleming, 1962 and Mundell, 1963) became dominant in the early 1960s and still has a prominent role in formulating policies related to the external economic structure of countries. Mundell-Fleming model focuses on output, interest rate and the exchange rate instead of the trade balance and the current account dynamics. Assuming international capital mobility, imperfect substitutability of domestic and foreign goods and a fixed aggregate price level, this model analyzes the simultaneous achievement of the internal and external balance of countries. The Mundell Fleming model stems from the traditional IS-LM framework and explains the impact of fiscal and monetary policies on the balance of payments through changes in exchange rate and domestic income. For example, a rise in government spending leads to an increase in income and interest rate, which results in capital inflows and the appreciation of domestic currency. Higher income and currency appreciation

cause a widening of current account deficit. However, the traditional Mundell-Fleming framework has certain drawbacks as far as the dynamic nature of the balance of payments considered. First, the Mundell-Fleming model focuses on the short run. In other words, it stresses the first round effects of fiscal and monetary policies ignoring the repercussions on the international indebtedness and the net foreign asset positions of countries. For example, while a fiscal expansion leads to a widening of current account deficit through the domestic currency appreciation and the higher domestic income, it also produces a rise in international indebtedness which in turn puts a pressure on the trade balance in order to ensure the debt servicing requirements. On the other hand, the Mundell-Fleming model is static in the sense that it does not help analyzing the dynamic nature of the balance of payments.

In this section, we present some open economy models that are developed in an intertemporal setting. These models rest upon micro-foundations in the sense that they focus on the utility maximization problem of agents with intertemporal budget constraints. The intertemporal open economy models rest on the assumption of capital mobility. Capital mobility allows agents to smooth consumption over time in a dynamic setting. Contrary to the Mundell-Fleming model, which defines an equilibrium point where the internal and external balance occur, the intertemporal models justify the external imbalances on the grounds that such imbalances result from the consumption smoothing behavior of agents and are not a cause for concern as they finance the domestic investment in case of any deficiency in domestic savings. We begin with the deterministic model of the current account with constant world interest rate and perfect foresight assumption. In this context, we examine the infinite horizon models and, moving from the representative agent framework, we exemplify some finite horizon overlapping-generations models which incorporate heterogeneity among agents. Then, we present the stochastic models of current account where the perfect foresight assumption is dropped and uncertainty is introduced. Lastly, we conclude with post Keynesian views on the current account and external imbalances.

### 3.1.1. Neoclassical Models of the Current Account

#### 3.1.1.1. Deterministic Models of the Current Account

*Infinite Horizon Models of the Current Account:*

Assume that the economy lasts T periods starting on date t and ending on date t+T. Output is determined by the production function  $Y=AF(K)$ .  $F(K)$  is strictly increasing in capital and subject to diminishing marginal productivity, that is,  $F'(K) > 0$  and  $F''(K) < 0$ . The economy starts at time t with predetermined stocks of capital,  $K_t$ , and net foreign assets,  $B_t$ . The representative household maximizes the following time separable utility function subject to an intertemporal budget constraint.

$$U_t = \sum_{s=t}^{t+T} \beta^{s-t} u(C_s) \quad (1)$$

In the above function, C is consumption and  $\beta$  is the subjective discount factor. In order to derive the budget constraint of the representative household, we define a one period current account identity assuming that the world interest rate, r, is constant over time.

$$CA_t = B_{t+1} - B_t = Y_t + rB_t - C_t - I_t - G_t \quad (2)$$

In equation (2) the current account balance is defined as the change in net foreign asset position.  $Y_t$ ,  $C_t$ ,  $I_t$  and  $G_t$  are income, consumption, investment and government expenditure respectively. Rearranging the terms;

$$(1+r)B_t = C_t + G_t + I_t - Y_t + B_{t+1} \quad (3)$$

$$(1+r)B_{t+1} = C_{t+1} + G_{t+1} + I_{t+1} - Y_{t+1} + B_{t+2}$$

Forward iteration of equation (3) leads to the following intertemporal budget constraint of the representative household:

$$\sum_{s=t}^{t+T} \left( \frac{1}{1+r} \right)^{s-t} (C_s + I_s) + \left( \frac{1}{1+r} \right)^T B_{t+T+1} = (1+r)B_t + \sum_{s=t}^{t+T} \left( \frac{1}{1+r} \right)^{s-t} (Y_s - G_s) \quad (4)$$

We rearrange the current account identity in equation (2):

$$B_{s+1} - B_s = rB_s + B_{s+1} + A_s F(K_s) - C_s - (K_{s+1} - K_s) - G_s$$

where  $I_s = K_{s+1} - K_s$  and  $Y_s = A_s F(K_s)$

$$U = \sum_{s=t}^{t+T} \beta^{s-t} u((1+r)B_s - B_{s+1} + A_s F(K_s) - (K_{s+1} - K_s) - G_s)$$

The first order conditions imply the intertemporal Euler equation and the equality between the marginal product of capital and the world interest rate.

$$u'(C_s) = (1+r)\beta u'(C_{s+1}) \quad (5)$$

$$A_{s+1}F'(K_{s+1}) = r \quad (6)$$

The following equality must always hold as the terminal condition because, at the end of the period, the economy should neither be net debtor nor be net creditor.

$$B_{t+T+1} = 0 \quad (7)$$

Thus, we can rewrite the intertemporal budget constraint of the representative agent as follows:

$$\sum_{s=t}^{t+T} \left( \frac{1}{1+r} \right)^{s-t} (C_s + I_s) = (1+r)B_t + \sum_{s=t}^{t+T} \left( \frac{1}{1+r} \right)^{s-t} (Y_s - G_s) \quad (8)$$

Letting  $T \rightarrow \infty$

$$\sum_{s=t}^{\infty} \left( \frac{1}{1+r} \right)^{s-t} (C_s + I_s) = (1+r)B_t + \sum_{s=t}^{\infty} \left( \frac{1}{1+r} \right)^{s-t} (Y_s - G_s) \quad (9)$$

Suppose that the period utility function is isoelastic, that is,  $u(C) = \frac{C^{1-1/\sigma}}{(1-1/\sigma)}$ . The Euler

equation in equation (5) takes the form

$$C_{s+1} = (1+r)^\sigma \beta^\sigma C_s \quad (10)$$

Depending on equations (9) and (10) and assuming that  $(1+r)^\sigma \beta^\sigma < 1$ :

$$C_t = \frac{(1+r)B_t + \sum_{s=t}^{\infty} (1/1+r)^{s-t} (Y_s - G_s - I_s)}{\sum_{s=t}^{\infty} [(1+r)^\sigma \beta^\sigma]^{s-t}} \quad (11)$$

Defining  $\vartheta \equiv 1 - (1+r)^\sigma \beta^\sigma$ , we rewrite equation (11) as follows:

$$C_t = \frac{r + \vartheta}{1+r} \left[ (1+r)B_t + \sum_{s=t}^{\infty} (1/1+r)^{s-t} (Y_s - I_s - G_s) \right] \quad (12)$$

$$W_t \equiv (1+r)B_t + \sum_{s=t}^{\infty} (1/1+r)^{s-t} (Y_s - I_s - G_s) \quad (13)$$

where  $W_t$  is wealth at the beginning of period  $t$ .

For a constant  $r$ , the permanent level of  $X$  is:

$$\sum_{s=t}^{\infty} \left( \frac{1}{1+r} \right)^{s-t} \tilde{X}_t = \sum_{s=t}^{\infty} \left( \frac{1}{1+r} \right)^{s-t} X_s \quad (14)$$

$$\tilde{X}_t \equiv \frac{r}{1+r} \sum_{s=t}^{\infty} \left(\frac{1}{1+r}\right)^{s-t} X_s \quad (15)$$

$$CA_t = (Y_t - \tilde{Y}_t) - (I_t - \tilde{I}_t) - (G_t - \tilde{G}_t) - \frac{\mathcal{G}}{1+r} W_t \quad (16)$$

The last term in equation (16) indicates the consumption tilting motive which arises as a result of the discrepancy between the subjective discount factor  $\beta$  and the world market discount factor  $1/(1+r)$ .  $\mathcal{G} > 0$  implies that  $\beta < \frac{1}{1+r}$  which means that the country is relatively impatient. In such a case, the current account balance worsens as a result of an increase in  $W_t$ . On the other hand, if  $\mathcal{G} < 0$ , that is,  $\beta > \frac{1}{1+r}$ , a higher the beginning of period wealth leads to an improvement in the current account balance as the country is relatively patient in this case.

The main assumption that underlies the dynamic macroeconomic models of current account is the consumption smoothing behavior of economic agents. Economic agents maximize utility in an intertemporal framework in the sense that they have intertemporal budget constraints that allow them to smooth consumption over time. For example, they may consume less than their income in one period and keep the part of their income that is not consumed for consumption in the next period. In such an analysis, saving is future consumption and the mere decision of economic agents is to optimize the period consumption levels. Equation (16) indicates that output above its permanent level leads to a higher current account surplus which is in line with the consumption smoothing behavior of economic agents. Instead of increasing consumption proportionally in case of a temporary rise in output, they accumulate foreign assets in order to smooth consumption for future periods. On the other hand, investment above its permanent value causes the current account balance to decline. Temporary increases in investment are financed through foreign saving which means a reduction in the current account balance. Lastly, government spending above its permanent level brings a decline in the current account balance as foreign savings contribute to the finance of the excessive government spending.

In order to observe the response of the current account balance to the changes in world interest rates, one should incorporate the case of variable interest rates to the

intertemporal model of the current account. Let  $R_{t,s}$  is the market discount factor for date  $s$  consumption on date  $t$  given that  $t \leq s$ . The real interest rate for loans between periods  $t$  and  $t+1$  is defined as  $r_{s+1}$ .

$$R_{t,s} = \frac{1}{\prod_{v=t+1}^s (1+r_v)} \quad (17)$$

The current account is now defined as follows:

$$B_{s+1} - B_s = Y_s + r_s B_s - C_s - G_s - I_s \quad (18)$$

Representative agent's budget constraint at time  $t$  takes the following form given that the generalized transversality condition holds:

$$\sum_{s=t}^{\infty} R_{t,s} (C_s + I_s) = (1+r_t)B_t + \sum_{s=t}^{\infty} R_{t,s} (Y_s - G_s) \quad (19)$$

$$\lim_{T \rightarrow \infty} R_{t,t+T} B_{t+T+1} = 0$$

The first order conditions of the individual's utility maximization problem are now defined as:

$$u'(C_s) = (1+r_{s+1})\beta u'(C_{s+1}) \quad (20)$$

$$A_{s+1} F'(K_{s+1}) = r_{s+1} \quad (21)$$

$$C_t = \frac{(1+r)B_t + \sum_{s=t}^{\infty} R_{t,s} (Y_s - G_s - I_s)}{\sum_{s=t}^{\infty} R_{t,s} (R_{t,s}^{-\sigma} \beta^{\sigma(s-t)})} \quad (22)$$

In case of variable interest rates, the permanent values of a variable can be found as follows:

$$\sum_{s=t}^{\infty} R_{t,s} \tilde{X}_t = \sum_{s=t}^{\infty} R_{t,s} X_s$$

The Euler equation indicates that the gross growth rate of consumption between  $t$  and  $s$  equals  $R_{t,s}^{-\sigma} \beta^{\sigma(s-t)}$ . The discount rate weighted average of consumption growth between  $t$  and future dates,  $\tilde{\Gamma}_t$ , can be defined as:

$$\tilde{\Gamma}_t = \frac{\sum_{s=t}^{\infty} R_{t,s} (R_{t,s}^{-\sigma} \beta^{\sigma(s-t)})}{\sum_{s=t}^{\infty} R_{t,s}}$$

By substituting equation (22) into the equation (18) we get the following current account identity:

$$CA_t = (r_t - \tilde{r}_t)B_t + (Y_t - \tilde{Y}_t) - (I_t - \tilde{I}_t) - (G_t - \tilde{G}_t) + \left(\frac{\tilde{\Gamma}_t - 1}{\tilde{\Gamma}_t}\right)(\tilde{r}_t B_t + \tilde{Y}_t - \tilde{I}_t - \tilde{G}_t) \quad (23)$$

Equation (23) indicates that the response of the current account balance to a change in the international interest rate depends on the net foreign asset position of the country. If the country is a net debtor, a fall in the world interest rate below its permanent level contributes to a reduction in the current account deficit or even to a surplus. On the other hand, for a net creditor country, the current account surplus declines following a fall in the international interest rate. Finally, the last term in equation (23) indicates the consumption tilting motive.

*Finite Horizon Overlapping-Generations Models of the Current Account:*

The overlapping-generations models, instead of a representative household, incorporate heterogeneity among individuals by distinguishing between young and old. These models stress the importance of demographics in determining national saving and current account. Higher saving rates which arise from the demographic composition of the population contribute to the higher current account surpluses. The overlapping-generations models suggest that government budget deficits may lead to current account deficits as the former redistributes income from future generations to the present. In order to observe this link, we assume that government issues a debt to finance a one-time transfer payment equally divided between the current young and old. In a representative agent model a bond financed transfer has no effect on consumption and the net foreign asset position for the economy because people are supposed to foresee the future taxes which is necessary to repay the debt. However, in an overlapping-generations model, such a transfer would have an effect on consumption and the current account.

An individual born at date  $t$  is supposed to have the following utility function:

$$U(c_t^y, c_{t+1}^o) = \log(c_t^y) + \log(c_{t+1}^o) \quad (37)$$

Individual's budget constraint is:

$$c_t^y + \frac{c_{t+1}^o}{1+r} = y_t^y - \tau_t^y + \frac{y_{t+1}^o - \tau_{t+1}^o}{1+r} \quad (38)$$

Where  $\tau$  is net lump sum tax,  $r$  is the world interest rate and  $y$  and  $c$  denotes income and consumption respectively. The first order conditions of the above maximization problem imply the following Euler equation:

$$c_{t+1}^o = (1+r)\beta c_t^y \quad (39)$$

The intertemporal budget constraint and the Euler equation give the following consumption functions:

$$c_t^y = \left( \frac{1}{1+\beta} \right) \left( y_t^y - \tau_t^y + \frac{y_{t+1}^o - \tau_{t+1}^o}{1+r} \right) \quad (40)$$

$$c_{t+1}^o = (1+r) \left( \frac{\beta}{1+\beta} \right) \left( y_t^y - \tau_t^y + \frac{y_{t+1}^o - \tau_{t+1}^o}{1+r} \right) \quad (41)$$

Suppose that at period  $t=0$ , government lowers the per capita tax by  $d/2$  for both young and old. In order to finance this tax cut, government sells bond worth  $d$  to the young. The interest payment on  $d$  is financed by imposing a tax burden divided between young and old as  $rd/2$ . Let  $c'$  denotes consumption following the implementation of these fiscal policies. The consumption levels of the period 0 old and young are respectively as follows:

$$c_0^{o'} = c_0^o + \frac{d}{2} \quad (42)$$

$$c_0^{y'} = c_0^y + \frac{1}{1+\beta} \left( 1 - \frac{r}{1+r} \right) \frac{d}{2} = c_0^y + \frac{1}{1+\beta} \left( \frac{1}{1+r} \right) \frac{d}{2} \quad (43)$$

Aggregate consumption at date 0 increases by:

$$c_0^{o'} + c_0^{y'} - (c_0^o + c_0^y) = \left[ 1 + \frac{1}{(1+\beta)(1+r)} \right] \frac{d}{2} \quad (44)$$

The current account identity at date 0 is:

$$CA_0' - CA_0 = - \left[ c_0^{o'} + c_0^{y'} - (c_0^o + c_0^y) \right] = - \left[ 1 + \frac{1}{(1+\beta)(1+r)} \right] \frac{d}{2} \quad (45)$$

Consumption level of the period 1 old (period 0 young) is defined as:

$$c_1^{o'} = c_1^o + (1+r) \frac{\beta}{1+\beta} \left( 1 - \frac{r}{1+r} \right) \frac{d}{2} = c_1^o + \left( \frac{\beta}{1+\beta} \right) \frac{d}{2} \quad (46)$$

For the period 1 young, consumption changes by the following amount:

$$\begin{aligned}
& -\left(1 + \frac{1}{1+r}\right) \frac{rd}{2} = -\left(\frac{2r+r^2}{1+r}\right) \frac{d}{2} \\
c_i^{y'} &= c_i^y - \left(\frac{1}{1+\beta}\right) \left(\frac{2r+r^2}{1+r}\right) \left(\frac{d}{2}\right) \\
c_i^{o'} &= c_i^o - \left(\frac{\beta}{1+\beta}\right) (2r+r^2) \left(\frac{d}{2}\right) \\
c_i^{o'} + c_i^{y'} - (c_i^o + c_i^y) &= \left[\left(\frac{\beta}{1+\beta}\right) - \left(\frac{1}{1+\beta}\right) \left(\frac{2r+r^2}{1+r}\right)\right] \left(\frac{d}{2}\right) \\
CA_1' - CA_1 &= r(CA_o' - CA_o) - \left[c_i^{o'} + c_i^{y'} - (c_i^o + c_i^y)\right] = -\left[\frac{\beta}{(1+\beta)}\right] (1+r) \frac{d}{2} \quad (47)
\end{aligned}$$

The current account balance remains in deficit in both period 0 and 1.

Buiter extends Diamond overlapping-generations model to a two country world where countries differ only in their pure rate of time preference in order. He analyzes the international capital mobility and the current account dynamics and concludes that the country with a high time preference (i.e. the country that consumes more in the first period) runs a current account deficit in steady state (Buiter, 1981). The overlapping-generations model help analyzing the effects of fiscal policy, taxes and demographic factors on the dynamics of current account.

### 3.1.1.2. Stochastic Models of the Current Account

The models analyzed so far are the deterministic models which assume perfect foresight and rules out uncertainty about consumption and investment. However, individuals do not perfectly foresee future while making their consumption and investment plans. At best, they decide in a stochastic environment depending on their conditional expectations. Thus, stochastic models introduce uncertainty and assume that economic agents have rational expectations. Rational expectations presume that, by using all the information available, people develop expectations about future events which are conditional upon this information set. These models help understanding the effects of shocks on the current account balance distinguishing between whether these shocks are permanent or temporary. The following stochastic model of current account shows the impact of output and productivity shocks on the current account balance. In

such a model, all future variables of output, investment and government consumption are random variables. A representative agent maximizes expected value the life time utility function:

$$U_t = E_t \left\{ \sum_{s=t}^{\infty} \beta^{s-t} u(C_s) \right\} \quad (24)$$

For simplicity, world interest rate is assumed to be constant. Iterating the current account identity in equation (2) ends up with the following intertemporal budget constraint just like in equation (9):

$$\sum_{s=t}^{\infty} \left( \frac{1}{1+r} \right)^{s-t} (C_s + I_s) = (1+r)B_t + \sum_{s=t}^{\infty} \left( \frac{1}{1+r} \right)^{s-t} (Y_s - G_s) \quad (25)$$

The difference between equations (9) and (25) is that the latter involves random variables and depends on the non-Ponzi game condition which states that debt never grows at the rate of interest. Incorporating the budget constraint into the utility function results in the following utility function:

$$U_t = E_t \left\{ \sum_{s=t}^{\infty} \beta^{s-t} u \left[ (1+r)B_s - B_{s+1} + Y_s - G_s - I_s \right] \right\} \quad (26)$$

The first order conditions imply that:

$$E_t \{ u'(C_s) \} = (1+r)\beta E_t \{ u'(C_{s+1}) \}$$

for  $s=t$ :

$$u'(C_t) = (1+r)\beta E_t \{ u'(C_{t+1}) \}$$

Assume that the subjective discount rate,  $\beta$ , is equal to the market discount rate,  $\frac{1}{1+r}$

and the utility function of the representative agent is in linear quadratic form, that is,

$u(C) = C - \frac{a_0}{2} C^2$ . The Euler equation states that:

$$E_t C_{t+1} = C_t \quad (27)$$

Equation (27) states that consumption follows a random walk. In order to derive consumption as a function of current and expected future values of output, investment and government spending, we can introduce equation (27) into the intertemporal budget constraint. The non-Ponzi game condition imposes that:

$$E_t \left\{ \sum_{s=t}^{\infty} \left( \frac{1}{1+r} \right)^{s-t} (C_s + I_s) \right\} = E_t \left\{ (1+r)B_t + \sum_{s=t}^{\infty} \left( \frac{1}{1+r} \right)^{s-t} (Y_s - G_s) \right\} \quad (28)$$

Substituting  $C_t$  for  $E_t C_s$

$$\sum_{s=t}^{\infty} \left( \frac{1}{1+r} \right)^{s-t} C_t = E_t \left\{ (1+r)B_t + \sum_{s=t}^{\infty} \left( \frac{1}{1+r} \right)^{s-t} (Y_s - G_s - I_s) \right\} \quad (29)$$

$$C_t = \frac{r}{1+r} \left[ (1+r)B_t + \sum_{s=t}^{\infty} \left( \frac{1}{1+r} \right)^{s-t} E_t (Y_s - I_s - G_s) \right] \quad (30)$$

If we eliminate investment and government spending and assume that the output follows the stochastic process defined in equation (31):

$$Y_{t+1} - \bar{Y} = \rho(Y_{t+1} - \bar{Y}) + \varepsilon_{t+1} \quad (31)$$

where  $\varepsilon_t$  is serially uncorrelated disturbance,  $E_t \varepsilon_{t+1} = 0$  and  $0 \leq \rho \leq 1$ .

For any  $s \geq t$ , expected value of the deviation of output from its permanent level takes the following form:

$$E_t \{Y_s - \bar{Y}\} = \rho^{s-t} (Y_t - \bar{Y}) \quad (32)$$

Consumption function can be written as:

$$C_t = rB_t + \bar{Y} + \frac{1}{1+r} \sum_{s=t}^{\infty} \left( \frac{1}{1+r} \right)^{s-t} E_t \{Y_s - \bar{Y}\} \quad (33)$$

Incorporating equation (32) into the equation (33):

$$C_t = rB_t + \bar{Y} + \frac{r(Y_t - \bar{Y})}{1+r-\rho} \quad (34)$$

If we introduce the stochastic process defined in equation (31) into the above consumption function, we end up with a consumption function in terms of unexpected output shocks.

$$C_t = rB_t + \bar{Y} + \frac{r\rho}{1+r-\rho} (Y_{t-1} - \bar{Y}) + \frac{r}{1+r-\rho} \varepsilon_t \quad (35)$$

If  $\rho$  is smaller than 1, the impact of shocks declines geometrically over time. This is meaningful in the sense that unexpected shifts in the current output lead to smaller changes in permanent output, that is, consumption responds less than fully to the output

shocks as a result of consumption smoothing. On the other hand,  $\rho = 1$  implies that the shock is permanent. We can write the current account identity as follows:

$$CA_t = \rho \left( \frac{1-\rho}{1+r-\rho} \right) (Y_{t-1} - \bar{Y}) + \left( \frac{1-\rho}{1+r-\rho} \right) \varepsilon_t \quad (36)$$

The current account identity implies that an unexpected positive shock to output ( $\varepsilon_t > 0$ ) contributes to a rise in the current account given that the shock is temporary. People accumulate assets with the part of the rise in output that is not consumed. On the other hand, a permanent output shock has no effect on the current account balance as there will be no motive for consumption smoothing in such a case.

There is a body of literature which analyses the impact of shocks on the current account balance. These studies distinguish among shocks according to their persistence (i.e. permanent or transitory shocks) or their scope (i.e. global or country specific shocks). For example, Glick and Rogoff analyze shocks in terms of their scope and find out that positive country specific shocks result in the deterioration of the current account balance whereas a global shock has no significant effect on the current account balance (Glick and Rogoff, 1995). On the other hand, some studies examine the impact of shocks which transmit to other economies although they are country specific in nature (Elliott and Fatas, 1996). The response of the current account balance to the shocks depends on the existence of markets for insurance against such shocks. The complete markets assumption implies that there are insurance markets for all future contingencies, that is, agents can trade a complete set of Arrow-Debreu securities. These securities are state contingent claims which pay off in only one state. If the risks associated with shocks are internationally traded in insurance markets, some local shocks may become global shocks while their current account response to these shocks eventually decline or even disappear.

### **3.1.2 Post-Keynesian views of the Current Account**

Keynesian models incorporate the concept of nominal price rigidities into the open economy macroeconomics. However, these models have been criticized on the grounds that they lack micro-foundations for intertemporal choice, these models do not stress current account balance, budget deficits and welfare. For example, Dornbusch's

over shooting model states that exchange rate overshoots its long run value in the short run as a result of the sticky nominal commodity prices. However, this model does not capture the current account dynamics or the effects of government spending as it does not analyze the private and government intertemporal budget constraints.

The main distinction between the neo-classical and Keynesian models of open economy macroeconomics lies behind the differences in the conceptualization of capital market theories. The neo-classical economics has a real theory of interest rate in which interest rate is the price which equates saving and investment. Domestic investment is financed either by national saving or by foreign saving where the latter is simply the current account deficit. Any imbalance between national saving and domestic investment is compensated by current account deficits. Hence, in a world of high capital mobility and developed financial markets, saving- investment correlation is expected to be low as the famous Feldstein-Horioka puzzle emphasizes (Feldstein and Horioka, 1980). On the other hand, Keynesian models depend on a nominal theory of interest rate where the interest rate is the price that equates the demand for and supply of assets. In these models, investment determines, income and, thus, saving (Keynes, 1960). The current account deficits and the capital account balance reflect the state of international payments. That is why Davidson stresses “international payments imbalances” instead of current account imbalances (Davidson, 2000).

Post-Keynesian view on the international financial system coincides with the closed economy of Keynes in the sense that the global economy can be perceived as a closed economy. In this context, the accumulation of net foreign reserves through the current account surpluses creates troubles which are quite as much like the problems related to the propensity to over-save in Keynes’ closed economy. This leads to a lack of effective demand in Keynesian sense. Davidson states that

...since the global economy is a closed economy, there is an obvious connection with the problems caused by the propensity to over-save in the closed economy of the General Theory and the ubiquitous desire of all nations (except the United States) to pursue export led growth policy for the purpose of accumulating additional dollar foreign reserves. This international saving propensity creates persistent high rates of involuntary unemployment and liquidity problems for the global economy-and this is true whether the global economy is on either a fixed or a flexible exchange rate system. (Davidson, 2003)

In order to prevent the accumulation of foreign reserves by surplus countries, these countries should be encouraged to inject these excessive credit balances to the international financial system. The Keynesian idea asserts that, in case of persistent payment imbalances, the international financial system puts the burden of adjustment on the debtor countries. However, creditor countries should equally be responsible from the current account imbalances and play a role in the process of eliminating these imbalances (Davidson, 2003).

### **3.2. Empirical Evidence on the Dynamics of the Current Account**

#### **3.2.1. The Role of Investment**

During the 1970s most people attributed the current account difficulties to the oil imports of countries. According to Sachs, this kind of relationship holds only in the short run and current account deficits depend on the differences in investment behaviour of countries. A permanent increase in oil prices has no impact on the current account as it influences both income and consumption while a temporary increase has by affecting income but not consumption as people borrow temporarily to smooth consumption. In his paper, Sachs emphasizes the importance of investment in widening current account deficits. In other words, the widening current account imbalances of LDCs did not stem from their oil dependence; instead, these imbalances were a result of the shift in the locus of new investment towards LDCs in the world economy. This also explains the discrepancies between the current account behaviour of developed and developing countries whose oil import dependences are comparable. According to Sachs, variations in investment demand dominate the medium run behaviour of current account and exchange rate and the current account deficits that stem from higher investment should not be thought as a cause of concern. On the other hand, Penati and Dooley (1984) conclude that there is no systematic relationship between the current account imbalances and the investment rates (Penati and Dooley, 1984). Contrary to Sachs, they argue that the current account imbalances, instead of responding the differences in the rates of returns to investment among countries, seem to reveal unanticipated shocks to incomes or the terms of trade. In line with Sachs' arguments, Nason and Rogers analyze the joint

dynamics of investment and the current account and point that investment booms coincide with high current account deficits (Nason and Rogers, 2002).

There is a body of literature which analyzes the dynamics of the current account through changes in investment. In order to obtain a more realistic modelling of investment behaviour, some studies introduced costly investment in the analysis of current account dynamics (Matsuyama, 1987, Ikeda and Gombi, 1998 and Karayalçın, 1994)<sup>3</sup>. The models without investment costs assume that the capital stock adjusts until the marginal product of capital is equal to the world interest rate. However, investment costs lead to the deviations of the marginal product of capital from world interest rate. Hence the inclusion of investment costs affects the response of the current account balance to certain shocks or policy changes. On the other hand, some studies analyze the dynamics of the current account balance through the impact of various shocks on investment. Productivity shocks, by influencing investment, also impinge on the current account balance. However, the impact of the productivity shocks differs according to their duration (i.e. whether they are permanent or temporary) and scope (i.e. whether they are global or country-specific). Glick and Rogoff examine the response of the current account balance to global and country specific productivity shocks and, depending on an intertemporal model of the current account; they conclude that country specific productivity shocks affect the current account whereas global shocks do not have any impact on the current account (Glick and Rogoff, 1995). On the other hand, Elliott and Fatas examine the effects of productivity shocks which are idiosyncratic in nature but propagate to other economies. They conclude that, contrary to the standard open economy models, such shocks lead to the increases in both investments in home and foreign countries; investment booms also coincide with countercyclical changes in the current account. Contrary to Glick and Rogoff's study, they find that the shock which quickly transmits to the other economies and, hence, acts as a global shock tends to have a larger impact on current account compared to the country-specific shock (Elliott and Fatas, 1996). Razin develops dynamic optimizing models of consumption and investment and examines the effects of productivity shocks on the current account

---

<sup>3</sup> Matsuyama (1987) extends Blanchard's model (Blanchard, 1985) incorporating investment with adjustment costs. Ikeda and Gombi introduce habit forming consumers with costly investment. For models with endogenous time preference see Karayalçın (1994).

balance through their impact on consumption and investment. Distinguishing between four types of productivity shocks, Razin concludes that, a permanent country-specific positive productivity shock leads to a worsening of current account as it results in a rise in investment and consumption also increases in excess of the increase in output. Conversely, a transitory country-specific productivity shock moves the current account balance into a surplus since, without any change in investment; it produces a slight increase in consumption which does not exceed the rise in output. On the other hand, the effects of the global shocks seem to be much weaker compared to those of idiosyncratic shocks (Razin, 1995).

In a model with only tradeable goods, investment influences consumption while consumption preferences do not have an impact on investment. The inclusion of nontradeable goods into the intertemporal models of the current account gives way to observe the impact of consumption decisions on investment. Following a shift of consumption preferences to the nontradeable goods, production in the nontradeable goods sector should increase since the country can not meet the increasing demand through importing. A shift of consumption preferences towards the nontradeable goods simply implies a transfer of resources from tradeable (or exportable) goods production to that of nontradeables. The resulting impact on the relative price of nontradeable goods has further implications for current account dynamics<sup>4</sup>. İşcan (2000) examines the effects of global and country specific productivity shocks on the current account in an economy producing both tradeable and nontradeable goods. İşcan concludes that the country specific productivity shock in tradeable goods sector has an impact on the current account while it has no effect if that shock is observed in the nontradeable goods sector. On the other hand, global shock has no impact on the current account regardless of whether it is observed in tradeable or nontradeable goods sector.

The introduction of durables has significant implications for the current account dynamics. Consumer durables may yield utility for more than one period; hence, the intertemporal prices play an important role for the trade balance in durables. Burda and

---

<sup>4</sup> Brock (1996) analyzes the adjustment of an economy with nontradeable goods to an international transfer. On the other hand, Matsuyama (1990) examines the relationship between residential investment and the current account.

Gerlach (1992) show that, during the 1980s the intertemporal prices account for the deterioration in the US trade balance which is strongly concentrated in durable goods.

### **3.2.2. The Role of Savings**

Saving (whether it is national or private) is negatively related to the current account deficit. Any increase in government budget balance (public saving) increases national saving if there is no Ricardian offset by private saving. Ricardian equivalence implies that, given that the government behaves under an intertemporal budget constraint, increasing the taxes or issuing government bonds in order to finance government consumption results in the same way. Government yields a higher amount of public saving by increasing the taxes. On the other hand, issuing government bonds as a means of financing government expenditure leads to an increase in private savings. Thus, higher public savings is associated with a decline in private savings which is called as the Ricardian offset. Hence, it is important whether public savings crowd out private savings. Empirical studies show that, although an increase in public savings is offset by a decline in private savings, the coefficient of such an offset is lower than one. Edwards (1995) shows that one unit increase in government saving generates a decline in private savings of 0, 55 unit (Edwards, 1995). On the other hand, public social security programs also have an impact on private savings. As far as households are supported through the social security benefits when they retire, they tend to save less for their older ages. Several studies stress the role of savings in the determination of the current account. For example, Ghosh and Ostry (1997) analyze the effects of macro economic uncertainty on the current account balance through its impact on precautionary saving behaviour. Engel and Kletzer (1986) examine the response of saving and the current account to higher tariffs. Daniel (1997) shows that precautionary saving can be the mechanism that restores net international indebtedness to its equilibrium value, removing the current account imbalance.

### **3.2.3. The Twin Deficit Hypothesis**

The relationship between current account and budget deficits has been widely analyzed in the literature. Ahmed uses a long historical data set for UK to analyze the

effect of government spending on the trade balance and concludes that the current account balance response to increasing government expenditures is negative and significant in so far as the increase in government expenditure is perceived as temporary by public (Ahmed, 1986, 1987).

The traditional view on the link between public deficits and external deficits was that the former, leading to a reduction in public saving, had a direct impact on the latter. In other words, the fiscal and external deficits are twin deficits in the sense that they move in the same direction. However, this view has been challenged by the proponents of the Ricardian Equivalence hypothesis (Barro, 1988). According to the Ricardian Equivalence hypothesis, any fall in the public saving which results from budget deficits is offset by the increase in private saving as people perceive fiscal deficits as future taxes<sup>5</sup>. Gramlich states that these deficits have distinctive characteristics: public deficits can not be reversed without policy action while there are some natural forces underlying the movement of external deficits (Gramlich, 2004). Accordingly, Enders and Lee argue that, regardless of the means of financing it, government spending induces a current account deficit. The current account and budget deficits are not twins in the sense that introducing taxes instead of issuing bonds in order to finance the government spending does not have any impact on the current account deficit (Enders and Lee, 1990). On the other hand some studies provide empirical evidence for the validity of the twin deficit hypothesis (Fidrmuc, 2003 and Piersanti, 2000, 2002)<sup>6</sup>. Normandin (1999) argues that the twin deficit hypothesis is relevant in explaining the link between budget and external deficits stressing the positive impact of the birth rate and the persistence of the budget deficits on the twin deficit behaviour.

#### **3.2.4. The Terms of Trade and the Current Account**

The relationship between the terms of trade and the current account balance has been widely discussed in the literature. The terms of trade, which is expressed as the ratio of export prices to the import prices, plays an important role in the trade balances

---

<sup>5</sup> Leiderman and Razin (1991) analyze the role of taxes and government spending in current account dynamics.

<sup>6</sup> Piersanti also examines the link between current account and the expected future budget deficits and propose a positive relationship between them.

of countries. Backus et al. propose an S-curve type of relationship between the cross correlations and the lag structure of the terms of trade changes implying that the trade balance is negatively correlated with the current and future changes in the terms of trade whereas it is positively correlated with the past movements of the terms of trade (Backus *et al.*, 1994). Senhadji (1998) extends the analysis of Backus et al. to the less developed countries and states that the S-curve explains the relationship between the terms of trade and the trade balance for less developed countries as well.

Adverse transitory terms of trade shocks result in a decline in current income which is greater than permanent income. Hence, deterioration of the terms of trade leads to a decline in savings out of any given level of income. Therefore, as a result of a decrease in savings the current account position deteriorates and the resulting impact is called as the Harberger-Laursen-Metzler effect (Harberger, 1950 and Laursen and Metzler, 1950). Thus, the Harberger-Laursen-Metzler effect is negative in the sense that the current account deficit increases following deterioration in the terms of trade. Several studies examined the validity of the Harberger-Laursen-Metzler effect. For example, Obstfeld questioned the Harberger-Laursen-Metzler effect arguing that deterioration in the terms of trade leads to an increase in saving rather than a decline, hence, the trade balance improves following the deterioration of the terms of trade (Obstfeld, 1982). On the other hand, Razin and Svensson (1983) conclude that a temporary terms of trade deterioration results in a worsening of the trade balance while the effect of a permanent terms of trade deterioration is ambiguous. Conversely, Serven (1999) objects to the Harberger-Laursen-Metzler effect by introducing capital goods imports. He concludes that permanent terms of trade improvement raises investment and leads to a worsening of the current account, contrary to the Harberger-Laursen-Metzler effect. However, the response of the current account to a transitory improvement in the terms of trade depends on the import content of investment, the persistence of the shock and the intertemporal substitutability of consumption and investment. Persson and Svensson (1985) extend the two period analyses of Razin and Svensson using an overlapping-generations model. They conclude that the effect of the terms of trade change on current account is sensitive to changes in parameter values. Alternatively, Otto (2003) provides evidence for the validity of the Harberger-Laursen-Metzler effect.

Galor and Lin (1994) propose a methodological critique to the intertemporal models concerning the relationship between the terms of trade and the current account. They argue that, while doing such an analysis, one should incorporate the changes in factor prices (i.e. interest rate) and the source of the deterioration of the terms of trade. Cashin and McDermott (2002) examined the effects of the terms of trade shocks on the current account for five industrial countries. They reported that the terms of trade shocks account for a small share of the variability in the current account balance for the UK, US and Canada while have significant impact for Australia and New Zealand. Cashin and McDermott explain the diverging patterns of these groups of countries on the grounds that the latter group has relatively small nontradeables sectors; hence they have limited scope for shifting between tradeables and nontradeables sectors.

### **3.2.5. Present Value Tests of the Current Account**

Theoretical models of the intertemporal approach to the current account assert that the current account depends on the deviations of interest rates, output, government spending and investment from their permanent levels (Obstfeld and Rogoff, 1995). Some studies tested whether the intertemporal approach provides a reliable benchmark for a solid analysis of the current account dynamics by applying present value tests (Ghosh, 1995, Otto, 1992, Sheffrin and Woo, 1990). These studies rest on Campbell's approach to the determination of savings. Campbell showed that the change in the expected future labour income has impact on savings, which implies "saving for a rainy day" (Campbell, 1987, Campbell and Shiller, 1987). The present value tests that derive from Campbell's methodology gauge whether the current account is equal to the expected future decline in a country's net output which is GDP net of investment and government expenditures. These tests compare the actual and predicted values of the current account balance. While doing this, the present values tests use the information embodied in the past current account to make better predictions of output, investment and the government expenditure. Sheffrin and Woo apply the present value tests to Canada, UK, Belgium and Denmark. They report that the intertemporal model performs well for the two of these four countries, Belgium and Denmark (Sheffrin and Woo, 1990). As the present value models do not empirically perform well, several studies test

the modifications to the standard intertemporal current account model to make the model better fit to the data. For example, Bergin (2000) applies present value test to show that incorporating variable interest rate and exchange rate improves the fit of the intertemporal model. Gruber (2003) examines the role of habit formation in explaining the volatility of current account. İşcan (2002) introduces durable goods which let time non-separable utility functions. Nason and Rogers (2003) suggest that including fiscal shocks and world interest rate shocks improves the fit of the model. On the other hand, several studies claim that the present value models based on Campbell Shiller methodology may yield misleading results<sup>7</sup>.

### **3.2.6. Empirical Analysis of the Determinants of the Current Account**

There are a few empirical studies that analyse the dynamics of the current account for developing countries as well as the advance ones. One of the earliest empirical studies on the determinants of current account balances is Khan and Knight's study (Khan and Knight, 1983), which depends on a panel data set of 32 non-oil developing countries for the period 1973-1981. They conclude that the terms of trade, growth in the industrialized countries and fiscal position are positively and significantly related to the current account balance whereas the current account balance responds to the real foreign interest rate and the real effective exchange rate negatively and significantly.

Debelle and Faruqee analyze the determinants of the current account balance depending on a panel data set that covers 21 industrial countries. They examine both the long run variations and short term dynamics of current account balance. They find that, in the short run, fiscal policy, the terms of trade, the exchange rate and the state of the business cycle have an impact on the current account balance while, in the long run, relative income, government debt and demographics significantly affect the determination of current account balance (Debelle and Faruqee, 1996).

Calderon et al. draw on a panel data set that includes 44 developing countries for the period 1966-94. They find that, in the short run, lagged current account deficit, domestic output growth rate, real effective exchange rate and external debt are positively

---

<sup>7</sup> See Kasa (2003) and Mercereau and Miniane (2004).

and significantly related to the current account deficit. On the other hand, the changes in terms of trade, the standard deviation of inflation which serves as a proxy for macroeconomic uncertainty, public saving, the industrialized country growth rate and the world real interest rate have a negative and significant impact on the current account deficit. However, in the long run, the lagged current account deficit is positively and significantly related to the current account deficit. On the other hand, the industrialized country growth rate, the world real interest rate and the log of the ratio of per capita GDP to the average per capita GDP of industrialized countries which represents the stages of development hypothesis have a negative and significant impact on the current account deficit (Calderon et al., 2002).

Chinn and Prasad emphasize the medium term determinants of the current account balance rather than the short run dynamics (Chinn and Prasad, 2003). They use a panel data set which covers 18 industrialized and 71 developing countries for the period 1971-95. Chinn and Prasad find strong positive and significant relationship between government budget balance and the current account balance. However, this relationship is not statistically significant for the sub-group of industrial countries. One explanation may be that, in developing countries, private saving does not completely offset a rise in the government saving. They also find a strong positive relationship between the current account balance and the initial net foreign asset position for the full sample and all sub-groups of countries (industrial and developing countries). According to Chinn and Prasad, among the developing countries, there is a group of countries that run large current account deficits and have a high amount of net foreign liabilities and these countries have better access to international capital markets and favoured by international investors. Financial deepening is positively and significantly associated to the current account balance except for the sub-group of industrial countries.

Özmen (2005) investigates the affects of institutional and macroeconomic policy variables on the current account deficits depending on a cross section data for a broad number of countries. Results show that better governance increases the ability of an economy to sustain current account deficits. Özmen (2005) also concludes that exchange rate flexibility and openness put a discipline on the current account deficit. On the other

hand, original sin leads to a decline in the ability of a country to sustain high levels of current account deficits.

Bussiere et al. depart from the standard representative agent assumption and develop an intertemporal model which differentiates between liquidity constrained (Non-Ricardian) and Ricardian agents. They analyze the current account dynamics of OECD and EU acceding countries and they find that the lagged value of the current account, fiscal balance, relative income and the relative investment positions determine the current account in the medium term (Bussiere et al., 2004).

There is a lack of empirical study that analyse the current account dynamics in developing countries. This is partly due to the limited data availability concerning developing economies. On the other hand, the response of the current account balance to certain macroeconomic variables may differ between industrialized and developing countries. Developing economies have some deficiencies in the sense that they have limited access to capital markets and thus have borrowing constraints. Moreover, these economies diverging initial net foreign asset positions and the contrasting net foreign asset positions of industrialized and developing countries influence the response of the current account balance to some variables like world interest rates. For example, if the country is a net debtor country, any increase in world interest rates leads to a widening of the current account deficit as the debt burden of the country increases. However, if it is a creditor country, the effect of such an increase in world interest rates does have an opposite sign. As a result, the effects of shocks on certain macroeconomic variables follow distinctive patterns in developing countries. The theoretical models do not fit to the developing countries in some respects. For example, the intertemporal models which rest on the maximisation problem of agents, who smooth consumption over time, are not well suited to the developing countries. Several studies attempt to test whether capital mobility is high enough in the sense that full consumption smoothing is valid for developing countries (Ghosh and Ostry, 1995).

Developing countries have difficulty in using their capital account to smooth consumption because they are not able to borrow abroad in their own currencies, which is called as the original sin. Debt servicing becomes even harder as a result of the changes in the exchange rate. Hence, the advanced countries get reluctant to lend to the

country which suffers from original sin, assuming that this country becomes more prone to financial crises due to the changes in the exchange rate (Eichengreen et al., 2003). On the other hand, developing countries have difficulty in financing their current account by foreign borrowing in the sense that there are currency mismatches between their liabilities and assets. Currency mismatch indicates the differences in the values of the foreign currency denominated assets and liabilities on the balance sheets of households, firms and government. Aggregate currency mismatch occurs when there is a net debt to foreigners denominated in foreign currency. Currency mismatch is a result of the original sin.

The current account deficits which are not attributed to the financial difficulties in advanced countries are a matter of concern as far as the emerging economies are considered. International financial markets stop lending to such economies at those levels of the current account deficits on the grounds that these levels of current account deficits are unsustainable. Some authors argue that history matters, that is, a country's past experiences in serving its debt has a role in forecasting its ability to sustain high levels of indebtedness in the future. This is called as the debt intolerance. Debt intolerance is the inability of emerging markets to manage the levels of external debt that are manageable for advanced countries (Reinhart et al., 2003). Debt intolerance is related to the problem of serial default; countries which defaulted in the past are supposed to be more prone to default in the future. They emphasize that weak institutions lead to serial defaults and debt intolerance in developing countries. However, there are contrasting examples like Chile, which has increasingly strong institutions and policies. However, in spite of the strong institutional set up and policies, Chile had difficulties when hit by an adverse terms of trade shock because of its inability to borrow in its own currency.

On the other hand, developing countries have distinct macroeconomic policies like imposing controls on capital flows and foreign exchange. Such diverging characteristics of the developing countries do not fit to the models that successfully explain industrial country current account balances and a thorough analysis of the current account balances of these economies becomes even harder. Reisen shows that the intertemporal approach fails to predict the responses of macroeconomic variables in

most capital importing countries and argues that some macroeconomic policies like the capital controls in Chile may be relevant in explaining this failure (Reisen, 1998).

## **CHAPTER 4**

### **DETERMINANTS OF THE CURRENT ACCOUNT: A DESCRIPTIVE ANALYSIS**

#### **4.1. Current Account Balance**

In this chapter, we analyze the movements in the current account balances of countries by grouping them according to their regional distribution, income level, level of development and level of indebtedness. Doing this, we stress certain commonalities and particular characteristics of these countries in terms of economic structure, export base and consumption and investment patterns. In some respects, regional proximity produces similarities as far as the patterns of current account balances of countries considered. This may be due to the fact that countries, being in the same region, have similar resource endowments and hence, similar export bases. This is important especially for the developing countries which, to a larger extent, depend on primary goods exports compared to the industrialized countries. Second and more importantly, these countries have strong trade linkages with the others in the same region. This makes their external imbalances linked to each other and, any economic distress can easily be transmitted to the other countries in the region. Third, regional closeness produces converging patterns in some structural economic characteristics: for example, Latin American countries have low saving rates whereas the East Asian countries are characterized by their high saving rates. On the other hand, grouping countries according to their income level and level of development is meaningful in the sense that development levels of countries play an important role in explaining their current account dynamics. Finally, classifying countries in terms of their level of indebtedness helps to observe the link between the current account imbalances and external

indebtedness. The latter carries great importance in evaluating the former because the interest payments of external debt are a part of the current account balance. Moreover, a country with a high level of external debt needs a large export base in order to meet the debt servicing requirements, thus, high levels of external debt put a pressure on the current account balances of countries. We use World Bank country classifications while grouping countries according to their income level and level of indebtedness. While grouping countries according to the level of development, we use the UN classification of least developed countries. Excluding the countries which are classified as industrialized and least developed, we end up with the sample of developing countries. Regarding the level of indebtedness, we divide the countries in the sample into four: the first group refers to the countries that are not classified as indebted; these countries are mainly industrialized countries. The second group of countries covers the less indebted countries while the third group and fourth group include the moderately and severely indebted countries respectively. Appendix A shows the country lists of these sub-categories. On the other hand, Appendix B illustrates the evolution of the current account balances of each country in the sample over time.

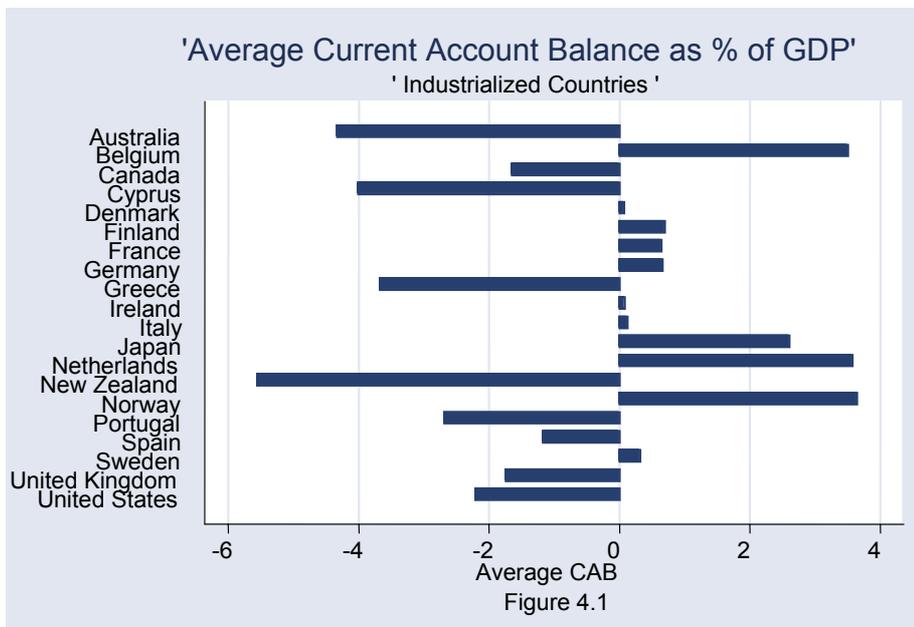
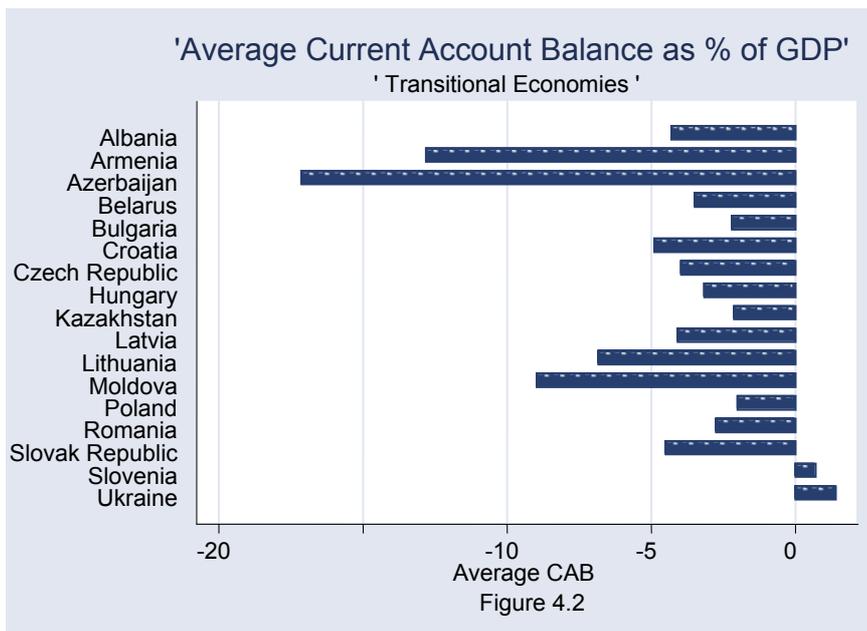


Figure 4.1 shows the average current account balances of industrialized countries for the period 1984-2001. Among these countries, Australia and New Zealand experience the largest current account deficits (above 4 % on average). There has been a literature on the current account dynamics of these countries. A considerable amount of foreign debt accompanies the current account imbalances of Australia. Cashin and McDermott (1998) state that Australia's current account deficit has been excessive and far beyond the optimal path of consumption smoothing. On the other hand, the current account deficits of New Zealand, being more volatile compared to the Australian case, have been analyzed regarding their consistency with the intertemporal budget constraint (Kim et al., 2001). Following Australia and New Zealand, Cyprus, Portugal, Spain and Greece also experience sizeable current account imbalances. Blanchard and Giavazzi (2002) argue that, following the economic and financial integration, the poorer countries of the European Union experience huge current account deficits. By being the countries with higher rates of return, these countries observe considerable increases in investment. On the other hand, having future growth prospects, these countries smooth consumption over time. Thus, lower domestic savings associated with higher investment result in widening current account imbalances. The richer countries of the union which are saturated in terms of investment have directed their funds to the countries that have low capital stock and, hence, high rate of return to capital. This can also explain the current account imbalances of transition economies. The average current account balances of the transition economies are described in Figure 4.2.

We observe that, most of these countries run enormous current account deficits in the post 1990 period. Rapid increase in investment in these economies and flow of funds especially from the European states can explain their huge current account deficits. On the other hand, the goods market integration has led to the increasing consumption through imports. Therefore, goods market and financial market integration play a role in the fluctuating current account positions of these countries. Major economies of the European Union including Belgium, Denmark, France, Finland, Ireland, Italy, Netherlands, Norway and Sweden have observed considerable current account surpluses especially following the beginning of 1990s. Germany experienced a current account reversal following the unification of East and West Germany. Japan has

a positive current account position for nearly most of the period. This may be due to significantly high level of domestic saving rates on the one hand and the considerably low levels of domestic consumption on the other. The current account position of USA has continually been worsening since the beginning of 1990s.



The intertemporal approach to the current account implies that a country run current account deficit in one period in order to smooth consumption over time. Thus, the deficit country eliminates the deficit in the next period to satisfy the intertemporal budget constraint. It reduces the current account imbalance by carrying the trade balance into surplus. However, the intertemporal approach neglects the role of asset prices and the exchange rate. In an increasingly sophisticated financial system, exchange rates and the asset prices play an important role in determining the countries' net investment positions. For example, while the foreign assets of the US are partly linked to the dollar, it holds dollar denominated foreign liabilities which are the dollar denominated foreign

assets of other countries. Thus, the depreciation of the dollar leads to a wealth transfer from the rest of the world to the US. The rate of return to the US foreign assets exceeds the rate of return to the US foreign liabilities (Lane and Milesi-Ferretti, 2003). Moreover, the domestic liabilities of most countries are denominated in their domestic currency while both the domestic and foreign liabilities of the US are in its own currency. Hence, on the one hand, the depreciation of the US dollar leads to a decline in returns to the countries holding the liabilities of the US. On the other hand, it results in an increase in the value of the domestic currency denominated liabilities of these countries. Therefore, depreciation of the dollar helps improving the net foreign investment position of the US.

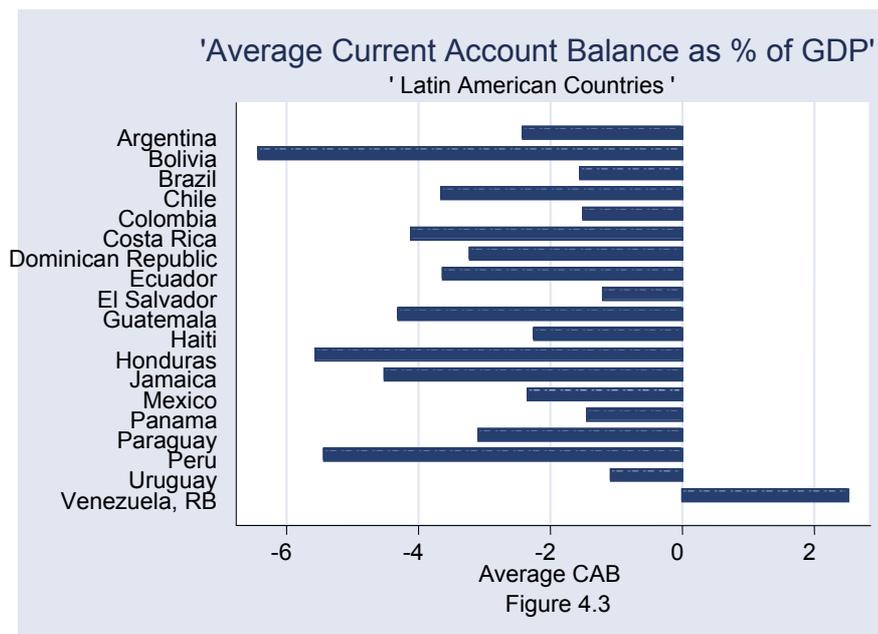
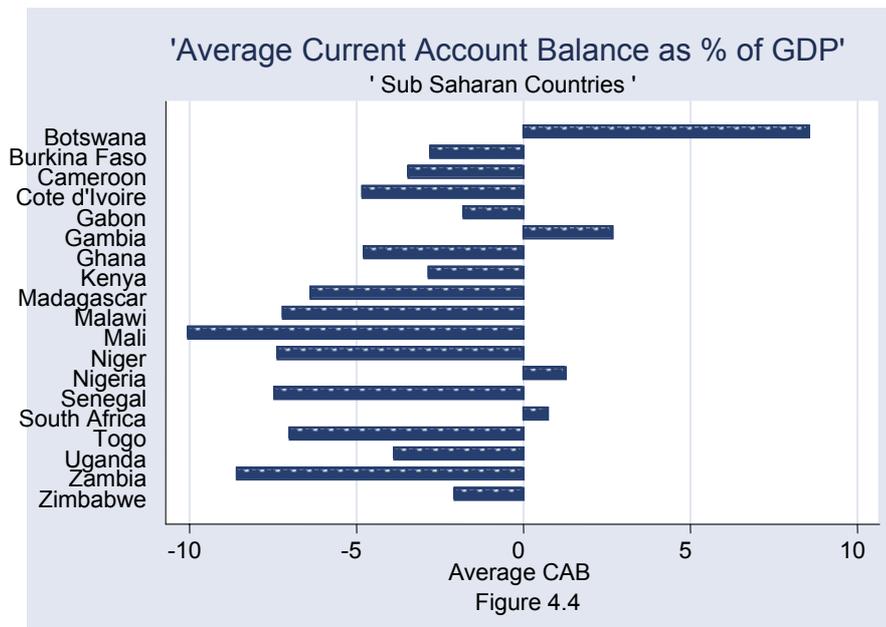


Figure 4.3 shows the average current account positions of the Latin American countries. All of the countries in the sample run large current account deficits except Venezuela. Being a member of OPEC, Venezuela’s exports mainly depend on petroleum

and its current account position is quite sensitive to the changes in the terms of trade and the world demand for petroleum. Most of the Latin American countries are primary goods exporters; hence, the current account positions of these countries have been considerably dependent upon the fluctuating terms of trade conditions. Thus, the current account positions of these countries that export primary goods have been more volatile in the sense that these countries are highly responsive to the fluctuations in the terms of trade. The continuous deterioration of the terms of trade against primary goods has led to the widening of current account imbalances in these economies. On the other hand, the current account patterns of countries that have a relatively sophisticated industrial structure (Argentina, Brazil Mexico, Uruguay and Chile) are relatively less volatile compared to the primary goods exporting countries. The flow of foreign direct investment to these countries contributed to the diversification of their export base and reduced their sensitivity to the terms of trade shocks.

Beginning with 1980s, most of the Latin American countries started to implement the structural adjustment programs guided by international economic institutions. The flow of funds supplied by the international economic agents have been directed to the unproductive uses and resulted in increased consumption which paved the way for boosting imports. The evolution of the current account positions of countries also shows the impact of macroeconomic turbulence on the current account balances. Huge current account deficits precede the episodes of economic crises. On the other hand, following an economic crises, we observe a sharp decline in the current account deficits of countries as a results of the significant output contraction. This was the case for Mexico in 1994 and Chile at the beginning of 1980s. In the same way, at the beginning of the 2000s, a group of Latin American countries (Argentina, Uruguay and Paraguay) experienced severe macroeconomic crises; their output contracted sharply. Subsequently, they run significant current account surpluses. Thus, countries that export primary goods and those which have a deeper industrial structure have diverging patterns of current account balance. The current account positions of the former have been mainly determined by external factors like the terms of trade and, hence, relatively more volatile. However, the current account balances of the latter, although following a relatively more stable path, significantly responds to the macroeconomic difficulties.

Figure 4.4 shows the average current account balances of the Sub-Saharan countries. Among these countries, only Botswana runs significant current account surplus. Precious metal exports play an important role in the foreign trade of Botswana and leads to the continuous surpluses in the current account balance of this country. The positive current account position of South Africa can be explained by the high share of precious metals exports in its trade balance. The current account balances of the Sub-Saharan countries are extremely volatile and sensitive to changing terms of trade conditions. Calderon et al. (2001) find out that the current account deficits of Sub-Saharan countries are excessive with respect to fundamentals. Moreover, the underlying factors behind such excessive current account imbalances are well different from even the other developing world. On the one hand, the current account imbalances of these countries are quite responsive to the high amount of foreign aid. On the other hand, these economies are characterized by low income levels and deficient amounts of saving. Hence, the current account balances of these economies follow significantly diverging patterns.



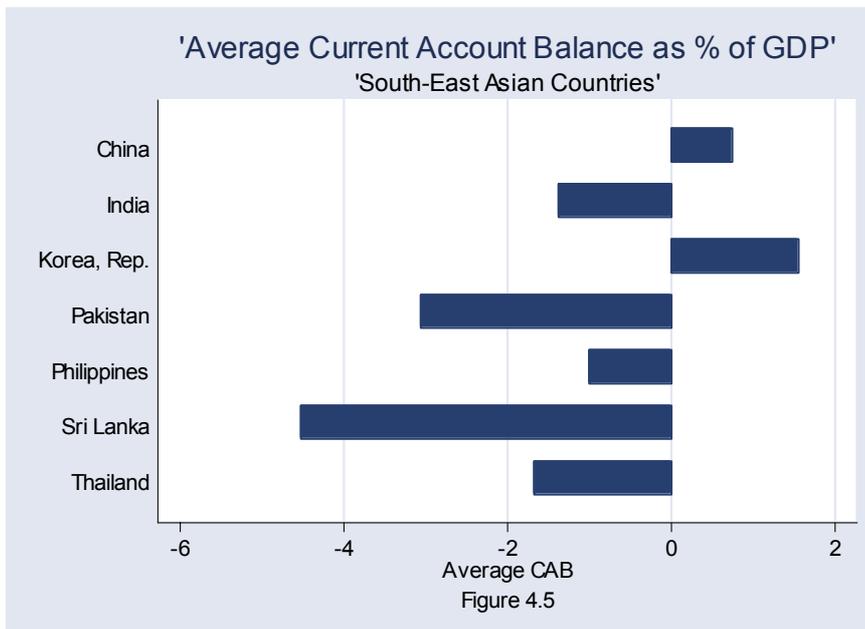


Figure 4.5 shows the current account balances of some Asian economies. Most of the countries in the sample run current account imbalances on average for the selected period. We can exclude China and Korea which experience considerable current account surpluses especially for the last part of the period. The increasing export base of China which depends on low labor costs has a significant impact on its positive current account position. In Korea, forced savings which were introduced as a part of the earlier development strategy resulted in considerably high saving rates. Moreover, the rapid growth period contributed to the evolution of a wide and sophisticated export base.

First of all, the current account deficits of these countries are closely related to the rapid growth and increasing investment during the last decades. On the other hand there is little evidence of excessive private consumption in these countries (Ostry, 1997). The economies of the regions were hit by a severe economic crisis in 1997 and this led to the contraction of output and positive current account balances in most of the countries. The deep industrial structure in most of these countries keeps their current account positions from being volatile; the fluctuating current account balances pose a great problem especially for the primary goods exporting countries. Increasing exports

continued to be the engine of economic growth in these countries and the diversification of the export base reduced the sensitivity of the trade balances of these countries to the terms of trade shocks. If we only examine the post 2000 period we observe that most of the countries in the region experience significant current account surpluses. The current account surpluses run by the Asian countries flow to the US, which has a continuous negative current account position since the beginning of 1990s.

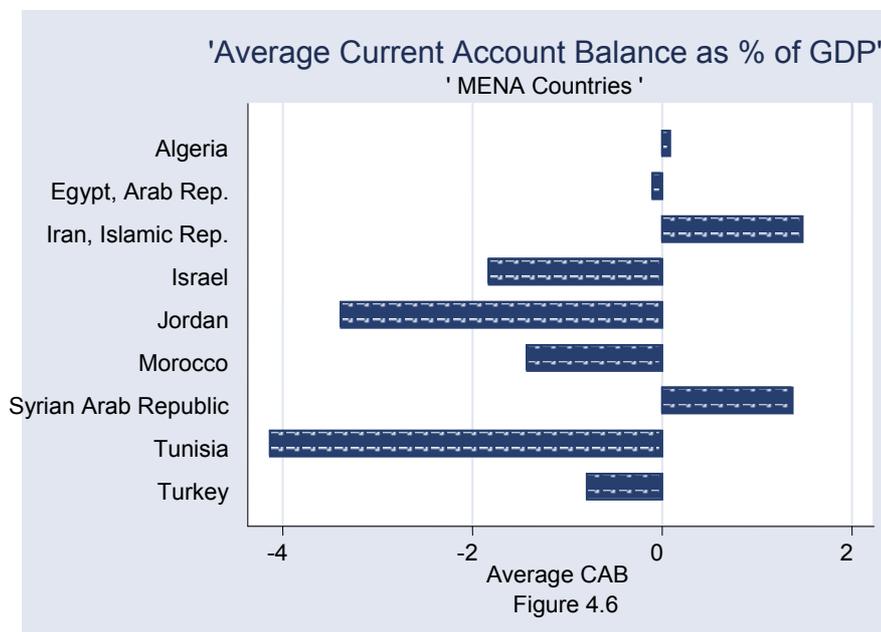


Figure 4.6 shows the current account positions of several economies in the MENA region. Again, we observe that OPEC countries like Iran and Algeria have a positive current account position on average. Most of the countries in the region have volatile current account balances. On the other hand these countries are not as much articulated to the world economy as other developing world like Asia and Latin America. Hence, low degree of articulation results in relatively smaller current account imbalances.

Figure 4.7 shows the short run and long run variations in current account balances of high income countries. In order to observe the between variations in the current account balances of countries, we should look at the dispersion of countries along the X axis. Going through the X axis, we observe the differences among countries' period average current account balances. Hence, we compare the long run current account patterns of countries. For example, New Zealand has a current account deficit of more than -5 % on average while, countries like Norway, Netherlands and Belgium experience considerably high current account surpluses on average (4 % approximately). Figure 5.7 also shows the short run variations in current account balances within countries. Going through the Y axis, we observe that the time series variations of current account within countries are substantial as well. For example, the within country dispersion of current account is low in Japan ranging from 1.5 % in 1990 to 4.23 % in 1986. On the other hand, the annual current account data of Norway exhibits a diverging pattern, ranging from -6 % in 1986 to 15 % in 2000.

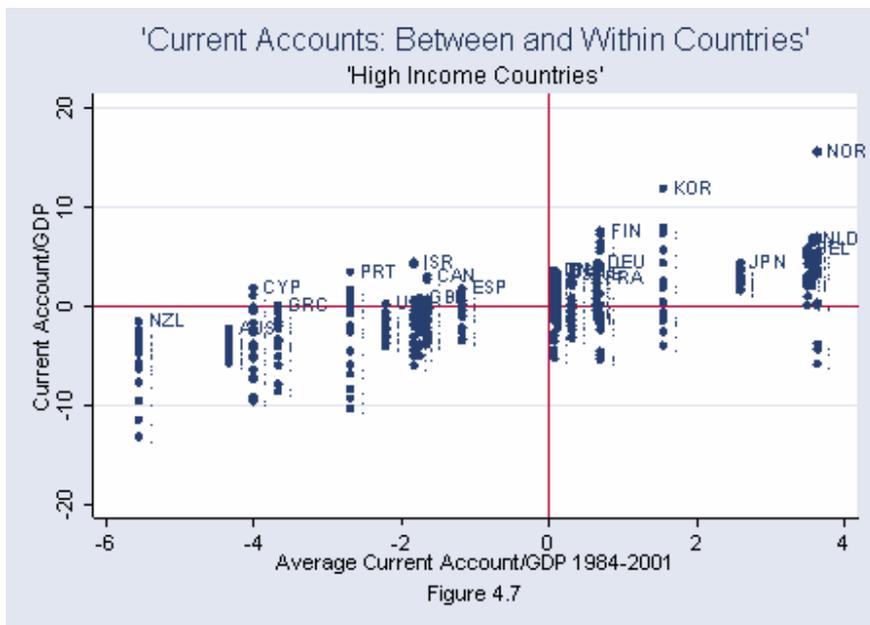


Figure 4.8 shows the within and between variations in the current account balances of upper middle income countries. As can be seen from the figure, among these countries, only Venezuela has a current account surplus on average. Venezuela, together with Panama and Gabon, experiences large within country variations in current account balances. On the other hand, countries like Uruguay and Argentina do not exhibit large dispersions in annual current account balances. This may be due to the fact that, for the former group of countries, the current account balances are relatively more exposed to the terms of trade fluctuations compared to the latter group of countries with diversified export base.

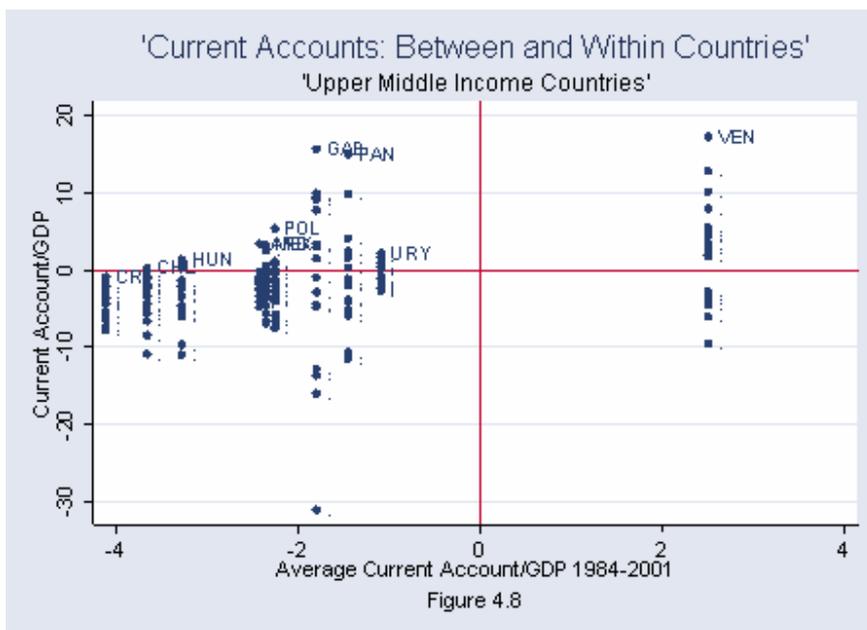


Figure 4.9 shows the between and within variations of current accounts in lower middle income countries. Among these countries, Syria, Iran, Algeria, South Africa and China have positive current account balances on average. The two of these countries (Algeria and Iran) are OPEC countries and South Africa is one of the main exporters of

precious metals. China has a large and diversified export base which rests upon low labor costs. The countries in the sample show large dispersions in long run current account balances ranging from Bolivia with more than -6 % on average to Syria and Iran which have current account surpluses more than 1 % on average.

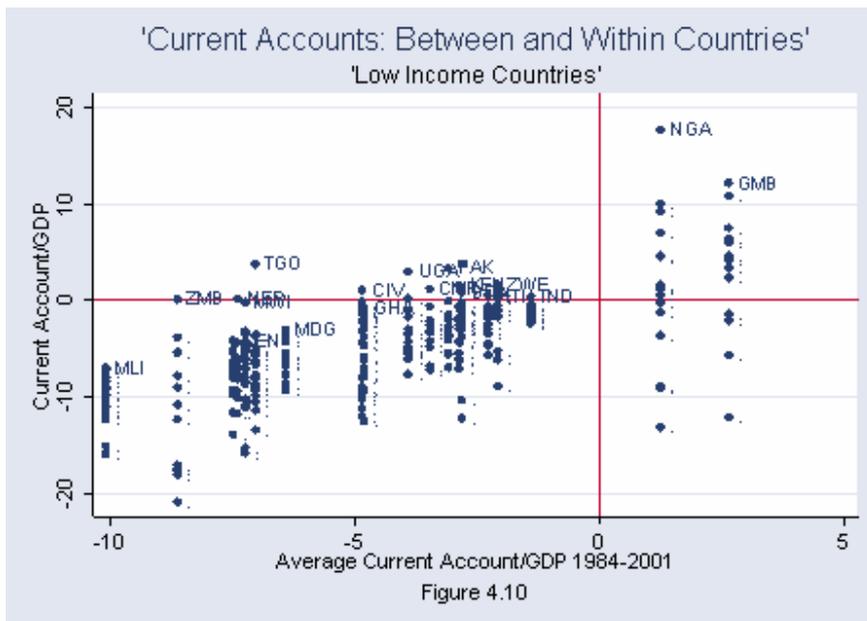
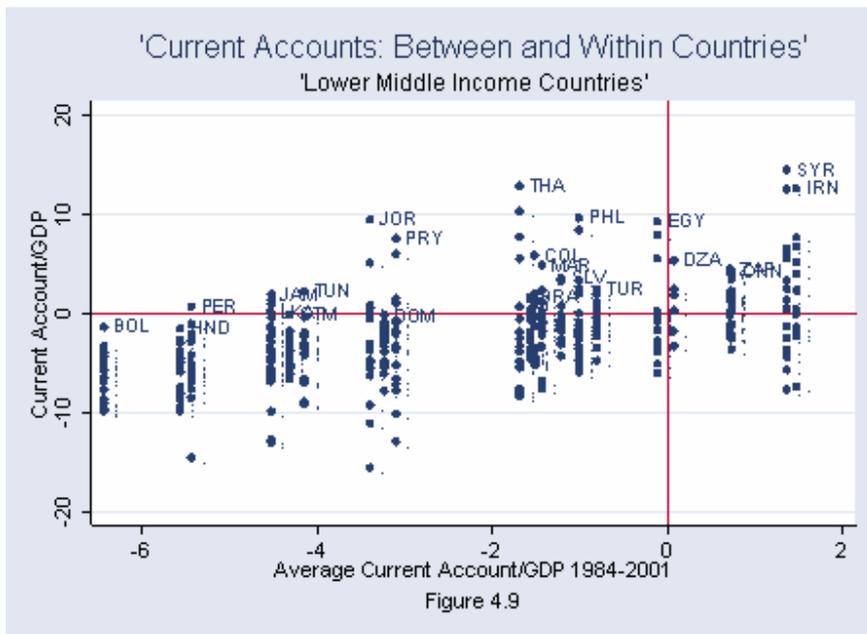
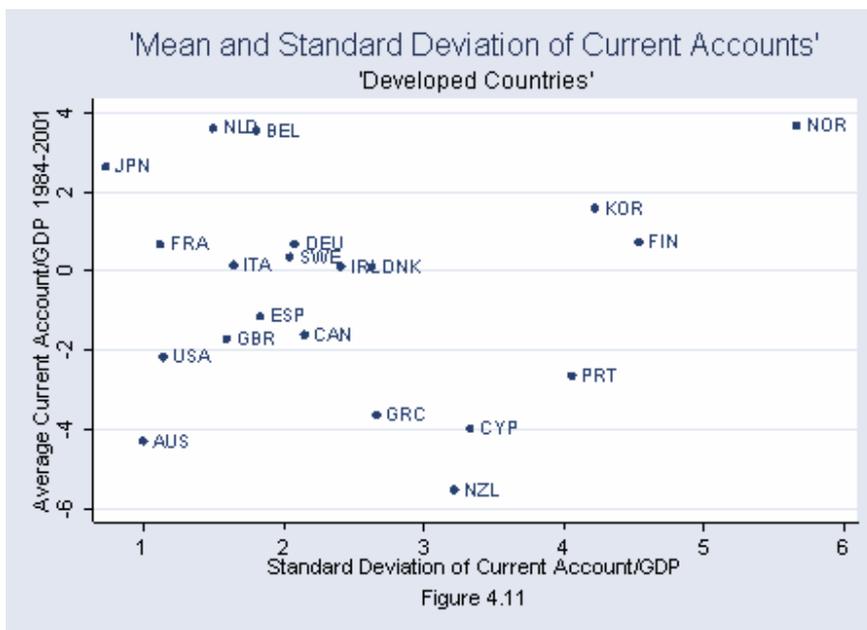


Figure 4.10 shows the short run and long run variations in the current account balances of the low income countries. The between country variations disperse on a wider range: starting from -10 % average current account deficit of Mali to the levels at around 3 % experienced by Nigeria and Gambia. Figure 4.11 shows the mean and the standard deviation of the current account balances of developed countries. Figure displays a bell shaped relationship between the mean and the standard deviation of the current account implying that current account deficits are associated with higher standard deviations of the current account balances within countries up to some level. Beyond a certain level, higher standard deviations of current account balances coincide with current account surpluses; this is the case for Korea, Norway and Finland. On the other hand, we observe a positive relationship between the mean and the standard deviation of the current account balances for developing countries.



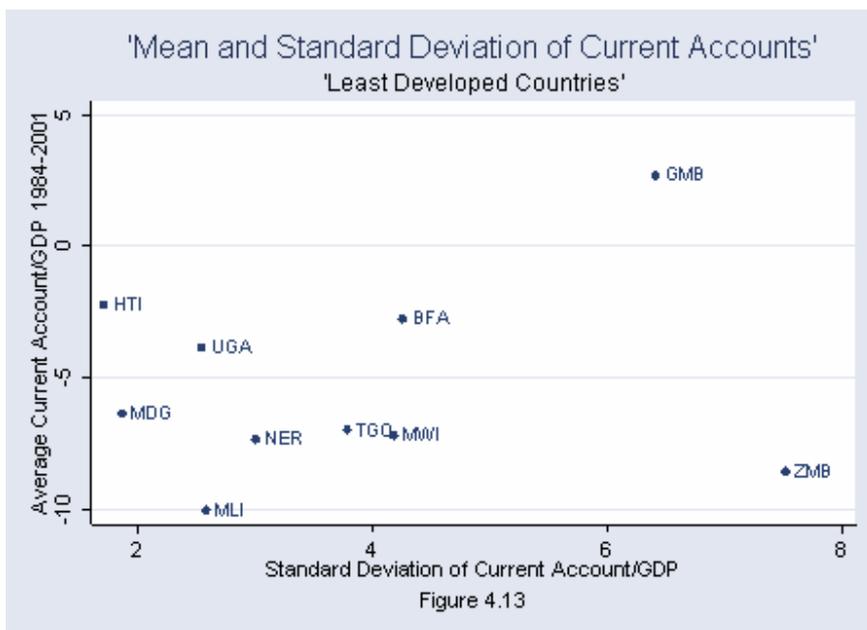
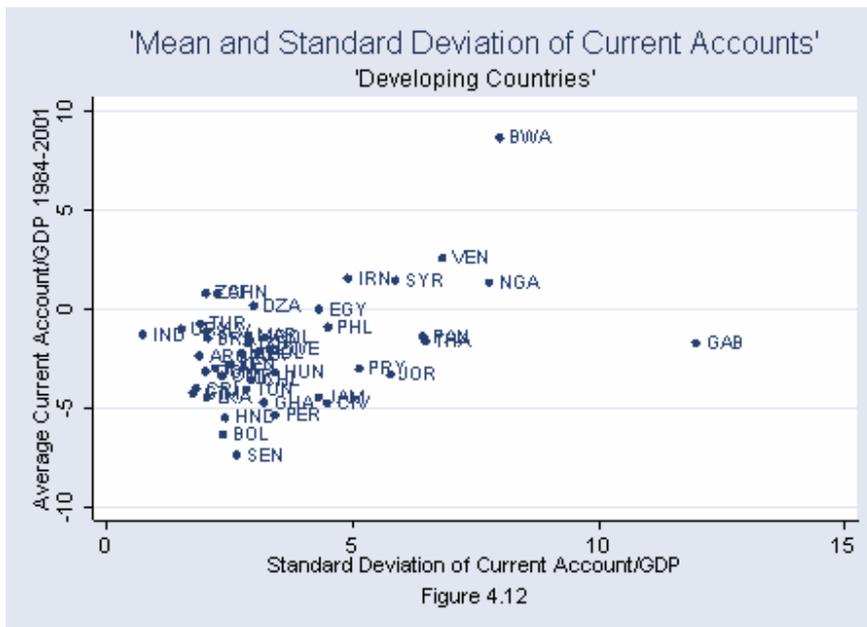


Figure 4.12 shows that higher levels of average current account balances are associated with higher standard deviations within countries. Countries like Nigeria, Venezuela and Botswana experience positive current account balances on average with considerably high standard deviations. These countries are among the primary goods

exporters; hence have large deviations in their current account balances. Finally, Figure 4.13 shows the relationship between the mean and the standard deviation of the current account balances of least developed countries.

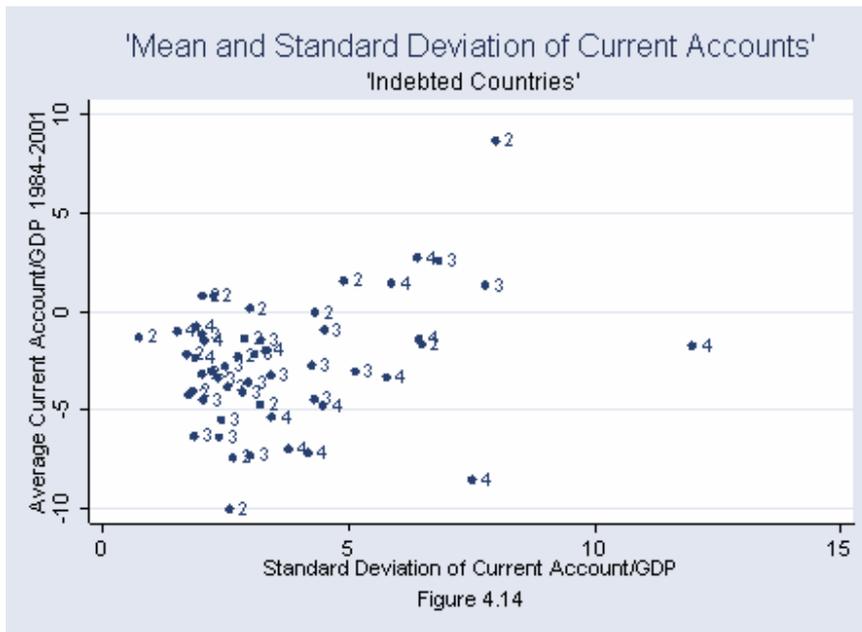


Figure 4.14 shows the relationship between the mean and the standard deviation of the current account balances of indebted countries. These countries are classified into three sub-categories: less indebted countries (2), moderately indebted countries (3) and severely indebted countries (4). As can be seen from the figure, most of these countries experience current account deficits on average; relatively more indebted countries have considerably larger current account imbalances.

Finally, we can put some concluding remarks regarding the evolution and the dynamics of the current account balances of both industrial and developing countries. First of all, we observe that the OPEC countries tend to have positive current account balance on average. Nigeria, Iran, Venezuela and Algeria are some examples of these

countries. Second, the current account balances of the countries that export primary goods seem to be relatively more volatile compared to those which have a diversified export base and deeper industrial structure. The latter is not so much sensitive as the former to the fluctuations in the terms of trade. Third, the structural adjustment programs in Latin America in the post 1980 period gave way to the rising consumption and boosting imports. However, excessive private consumption did not play a role in the trade balances and the current account dynamics of Asian countries. Fourth, the concept of forced saving is introduced as a part of the development strategy in Asian countries and saving rates continued to be high while low saving rates characterize the economies of the Latin America. Fifth, economic crises lead to the current account reversals resulting in major declines in current account deficits. This is especially true for Latin American countries as their production is more sensitive to the transitory shocks and macroeconomic situation. Lastly, among the European countries, financial and economic integration lead to the flow of surpluses of the investment mature countries of the union to the transition economies with ample investment opportunities. Thus, the current account deficits widened enormously in the transition economies and the relatively poorer economies of the union.

## **4.2. Determinants of the Current Account Deficits**

In this section, we present the descriptive analysis of the main determinants of the current account deficits. We analyze the data on governance, exchange rate regime, capital controls, the terms of trade, financial deepening and openness for regionally classified sub-samples.

### **4.2.1. Governance**

There is a broad literature on the role of institutions and governance in economic process. For example, Beck and Levine (2003) analyze the role of legal institutions in shaping the functioning of financial systems. Prasad *et al.* (2004) state that good institutions and the quality of governance are crucial in helping developing countries to reap the benefits of globalization. Rodrik (2000) goes further asking “which institutions matter and how does one acquire them?” In fact, governance plays an important role in

the functioning of economic structure. The quality of governance particularly affects investment reducing the uncertainty about economic environment. On the one hand, a country with sound institutional setting and better governance attracts more capital inflows and foreign direct investment. Moreover, higher transparency, well functioning of bureaucracy and regulatory bodies and the credibility of institutions create an environment conducive to better allocation of resources and higher domestic and foreign investment.

Kaufmann *et al.* (2002) define governance as “the traditions and institutions by which authority in a country is exercised”. This definition covers the three aspects of governance: the political process through which governments are brought into power, the ability of the government in formulating and implementing policies and the credibility of the institutions. Thus, the term “good governance” refers to these aspects in the following ways. First, legitimacy of the exercise of authority should be guaranteed in the sense that exercise of the authority should depend on the consent of society. Second the well functioning of the government should be provided. Third, respect of public and the state for the institutions should be ensured.

Kaufmann *et al.* construct a new database on governance depending on six main clusters; these are voice and accountability, political instability and violence, government effectiveness, regulatory burden, rule of law and graft. This data set is discrete and reported for the years 1996, 1998, 2000 and 2002 (Kaufmann *et al.*, 2002, 2004). The data set constructed by Kaufmann *et al.* comprises only the political component. On the other hand, the International country risk guide encompasses 22 variables from three sub-categories: political, financial and economic risk. The index ranges between 0 and 100 where higher values indicate relatively lower levels of risk, a rating less than 50 being a sign of very high risk. This index is constructed in the following way; the political risk is assigned between 0 and 100 while the economic and financial risk ratings vary between 0 and 50. Then, the total amount of risk is divided into two ending up with a score between 0 and 100. Thus, the weight of the political risk sub-category is higher compared to the other two sub-categories. The political risk sub-category covers 12 different variables of risk while the economic and financial risk sub-categories both comprise 5 components of risk. For each of these 22 components, a

score is assigned between 0 and 100 and these scores are summed into one risk rating for each sub-category depending on their relative weight. The composite risk rating is calculated by adding the political, economic and financial risk components, the first sub-category having twice weight compared to the economic and financial sub-categories which are equally weighted.

Among the political risk components, government stability, socio-economic conditions, investment profile, internal conflict and external conflict are weighted as 12 points over 100. The political risk component also covers some variables that have relatively lower weight (6 points over 100). These are corruption, military in politics, religion in politics, law and order, ethnic tensions and democratic accountability. The economic risk component aims to evaluate the strength of the economic structure. It depends on the information from five sub-components: GDP per capita, real GDP growth, inflation rate, budget balance as percent of GDP and the current account as percent of GDP. On the other hand, the financial risk component assesses the ability of a country to finance its all types of obligations. This component comprises five sub-components which are foreign debt, foreign debt service as a percentage of exports of goods and services, the current account as percent of exports of goods and services exchange rate stability and net international liquidity as months of import cover. The last component is the ratio of official reserves to the average monthly import cost and shows how long a country can meet its import costs with its existing stock of reserves.

The composite risk rating covers information from all sub-components although the political risk component is twice weighted as the economic and financial risk components. The composite risk ratings that are below 50 indicate very high risk where the scores between 50 and 60 is a sign of high risk and the scores between 60 and 70 shows moderate level of risk. Finally, the ratings between 70 and 80 point out low risk and the scores above 80 represent very low risk. We employ the international country risk guide as a proxy for governance because it depends on a broader set of sub-categories including economic and financial risk and it is continuous calculated for all years between 1984 and 2003. We use the international country risk guide ratings as a proxy for governance. First, it captures all three dimensions of governance; political, economic and financial. On the other hand, it provides a continuous data set reporting

annual observations for a relatively broader time span covering the period between 1984 and 2003.

The international country risk ratings do not show significant variations within countries, rather, the score tends to vary between cross sections. Figure 4.15 shows the average country risk score for industrial countries. As can be shown from the figure, industrial countries, in general, have high scores implying that these countries are characterized by better governance, strong institutions and low levels of risk. Most of the countries in the sample have scores above 80, the lowest ones being Greece and Cyprus.

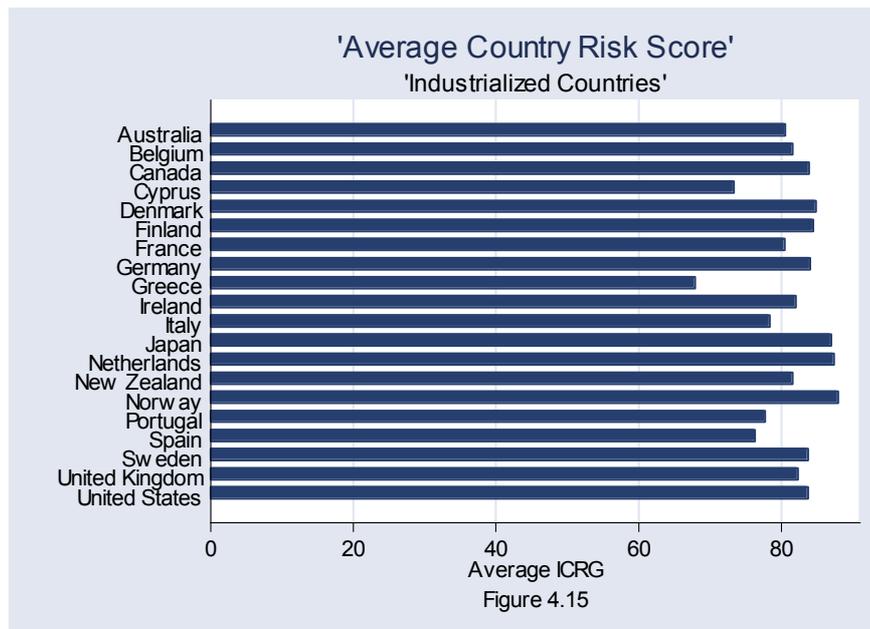


Figure 4.16 shows the average country risk ratings of Latin American Countries. Among them, Chile Costa Rica, Mexico and Uruguay have the highest scores. These countries are characterized by deeper industrial structure and a relatively more diversified export base. Especially Chile has strong institutions compared to the other

countries in the region. Haiti, which has been living with long lasting civil wars, has the lowest risk rating.



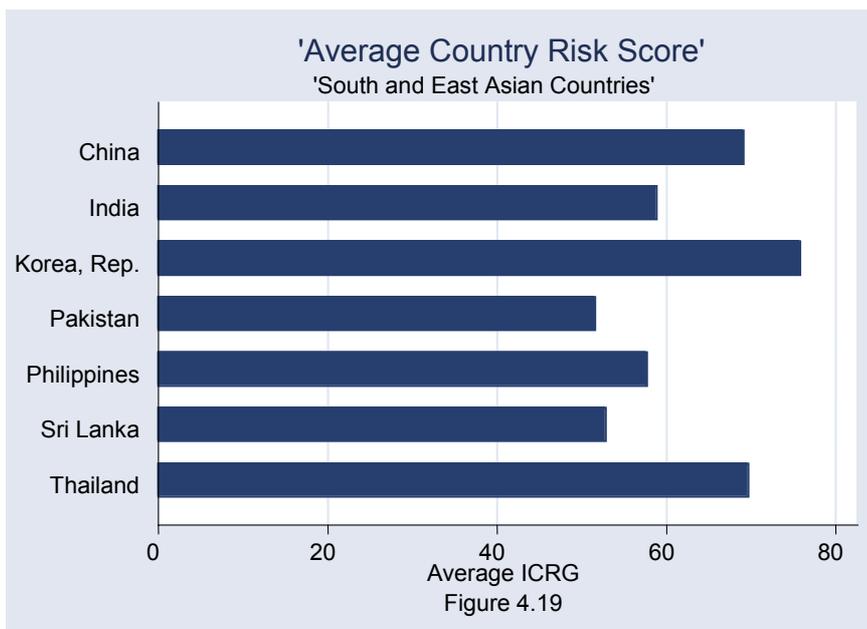
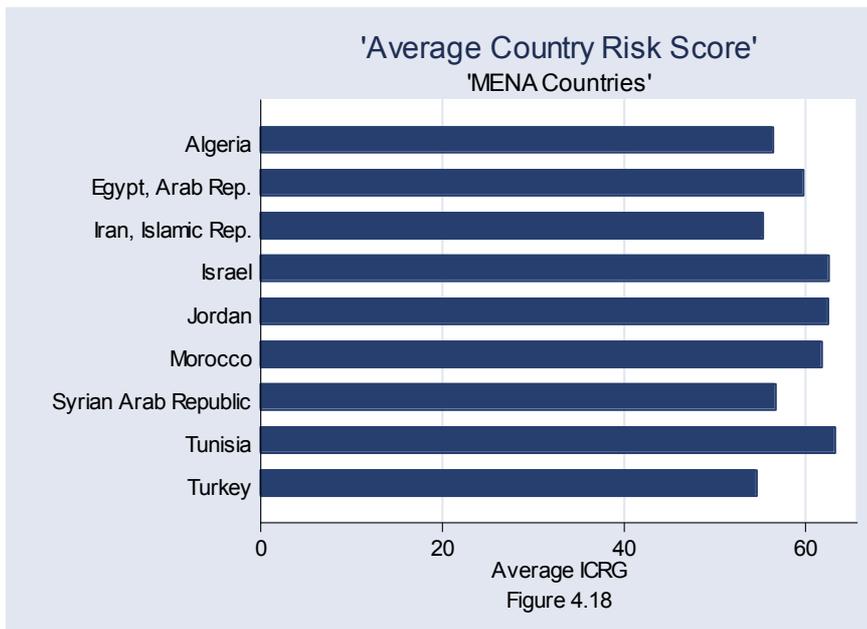


Figure 4.17 shows the average country risk rating for Sub-Saharan countries. Almost all of the countries in the region have scores less than 60, implying high levels of risk. Botswana has the highest risk rating while the score of Uganda seems to be the lowest one in the region. On the other hand, MENA countries, described in Figure 4.18,

have relatively lower risk ratings, reflecting the political instability throughout the region.

Finally, the Asian countries exhibit relatively higher levels of risk ratings compared to the Latin American countries and Sub-Saharan Africa. Among these countries, Korea reaches to the levels observed in industrial countries, namely, higher than 70 on average. Thailand and China, in the same manner, seem to have a low level of risk. The rest of the countries in the sample tend to have scores which are less than 60 (Figure 4.19).

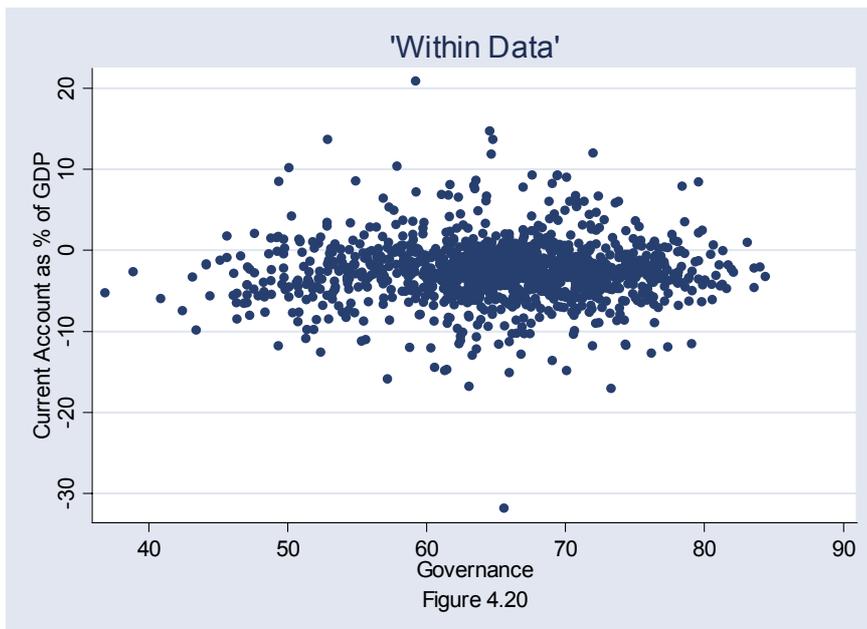
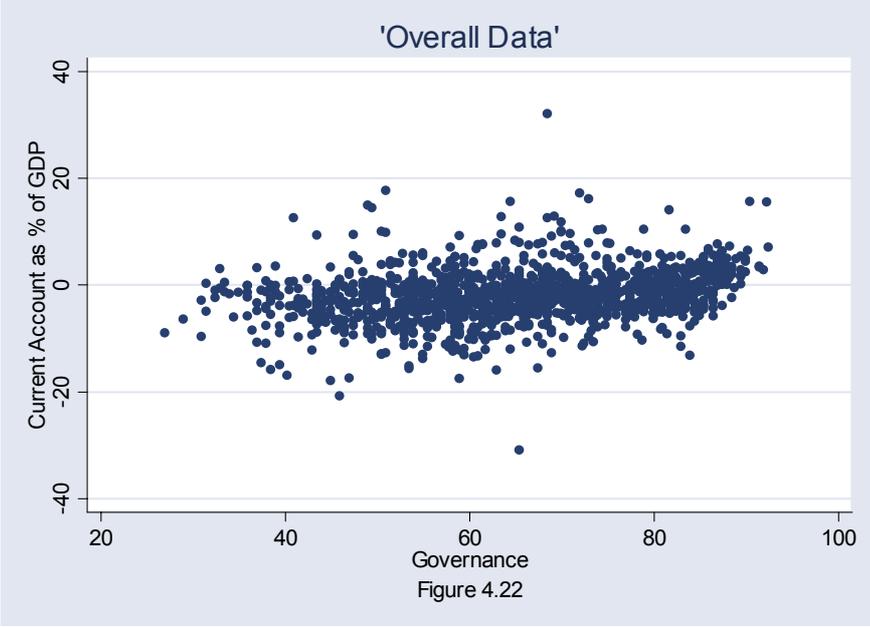
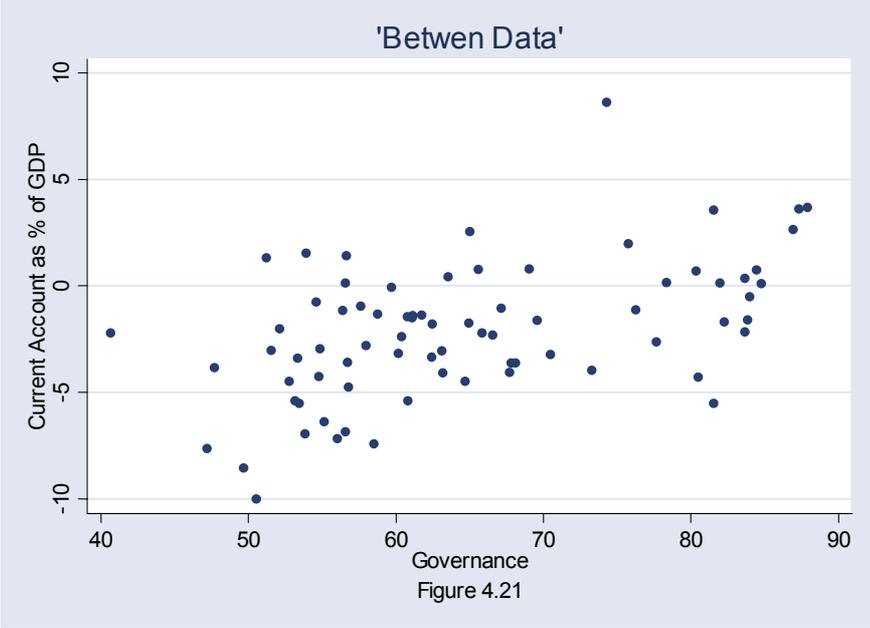


Figure 4.20 shows the relationship between current account balance and governance within countries. As can be seen from the figure, it is not possible to derive an exact relationship. However, if we analyze the correlation of these variables between countries, we observe that higher current account balances are associated with better governance (Figure 4.21). On the other hand, the overall data, like the within data,

shows that the correlation between the current account balance and governance is ambiguous (Figure 4.22).



A direct comparison of countries in terms of their current account positions and governance structure demonstrates that countries that have positive current account positions on average are generally the ones with strong institutional setup and better governance. Belgium, Japan and Netherlands are examples of these countries. However, any increase in governance indicators is associated with widening current account deficits within a country. This is especially true for the countries that exhibit significant within country variations in governance indicators and current account deficits. For example, in most of the transition economies, the continuously improving governance indicators coincided with widening current account deficits during the post 1990 period. In the same manner, in some Latin American countries like Argentina, huge current account deficits are associated with improving governance indicators.

#### **4.2.2. Exchange Rate Regime**

There is a broad literature on the role of exchange rate regimes in trade, capital flows and growth issues. Calvo et al. (2004) examine the probability of sudden stops under different exchange rate regimes. Accordingly, Calvo et al. (2003) evaluate the impact of sudden stops in Argentina in the context of the fixed exchange rate regime implemented when the Argentinean economy faced with sudden stops. Guidotti et al. (2004) conclude that countries which have a flexible exchange rate regime tend to grow faster and experience a speed recovery from output contraction in the aftermath of sudden stops. On the other hand, Edwards (2004a, 2004b) shows that countries with relatively flexible exchange rate regimes are able to accommodate better with shocks resulting from current account reversals.

Looking at the role of the exchange rate regime on the dynamics of the current account balances, we use the data based on the exchange rate regime classifications of Reinhart and Rogoff (2002)<sup>8</sup>. According to this classification, the type of the exchange rate regime ranges between 1 and 15, the higher values indicating the relatively flexible exchange rate regimes. Reinhart and Rogoff (2002) define the exchange rate regime classification codes as follows:

---

<sup>8</sup> The classifications of historical exchange rate regimes are provided in the appendix of Reinhart and Rogoff, 2002).

**Table 4.1: The Exchange Rate Regime Classification Codes:**

---

1	No separate legal tender
2	Pre announced peg or currency board arrangement
3	Pre announced horizontal band that is narrower than or equal to +/-2%
4	De facto peg
5	Pre announced crawling peg
6	Pre announced crawling band that is narrower than or equal to +/-2%
7	De facto crawling peg
8	De facto crawling band that is narrower than or equal to +/-2%
9	Pre announced crawling band that is wider than or equal to +/-2%
10	De facto crawling band that is narrower than or equal to +/-5%
11	Moving band that is narrower than or equal to +/-2% (i.e., allows for both appreciation and depreciation over time)
12	Managed floating
13	Freely floating
14	Freely falling
15	Dual market in which parallel market data is missing.

---

Reinhart and Rogoff (2002) start with asking whether there are dual or multiple rates or active parallel markets. If there is no dual or parallel market, they check the existence of an official pre-announced exchange rate regime. If there is a pre-announced exchange rate arrangement, they examine the exchange rate data in order to verify the pre-announced exchange rate regime. If the pre-announced regime is verified, the exchange rate regime can be classified as pre-announced peg, pre-announced crawling peg, pre-announced band, managed floating, freely floating etc. However, if the prevailing exchange rate regime is not in accord with the pre-announced arrangement, they try to find out de facto exchange rate regimes. In case of the existence of dual or parallel markets, again, de facto exchange rate arrangements are reported. Such arrangements can be classified as de facto peg, de facto crawling peg, de facto crawling band, managed floating, freely floating etc. The exchange rate regimes that can not be classified through the steps described above are either categorized as managed or freely floating. Lastly, if the annual inflation rate is above 40 %, the exchange rate regime is classified as freely falling.

When we examine the exchange rate regimes for the period 1984-2001, we observe that industrial countries exhibit diverging patterns regarding the flexibility of exchange rate regime (Figure 4.23). Among the industrialized countries, Australia, Japan

and the USA have highly flexible exchange rate regimes while Belgium, France and Netherlands have considerably rigid exchange rate regimes.

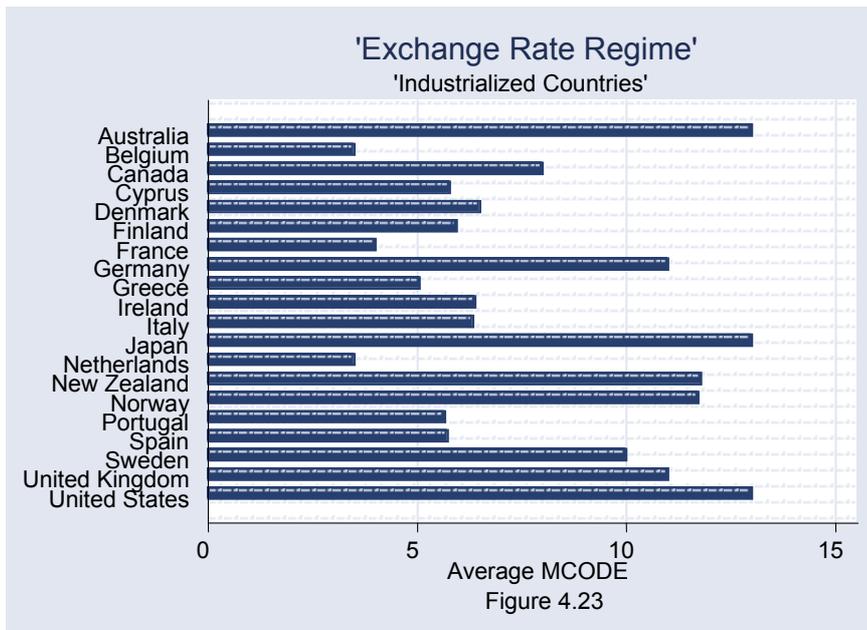


Figure 4.24 show the exchange rate regime classifications for Latin American countries. Brazil, Ecuador, Uruguay and Venezuela have the most flexible exchange rate regimes in the region while those of Chile, Colombia, Dominican Republic, Mexico and Haiti are considerably flexible. On the other hand, Panama has an extremely rigid exchange rate regime compared to the other countries in the region.

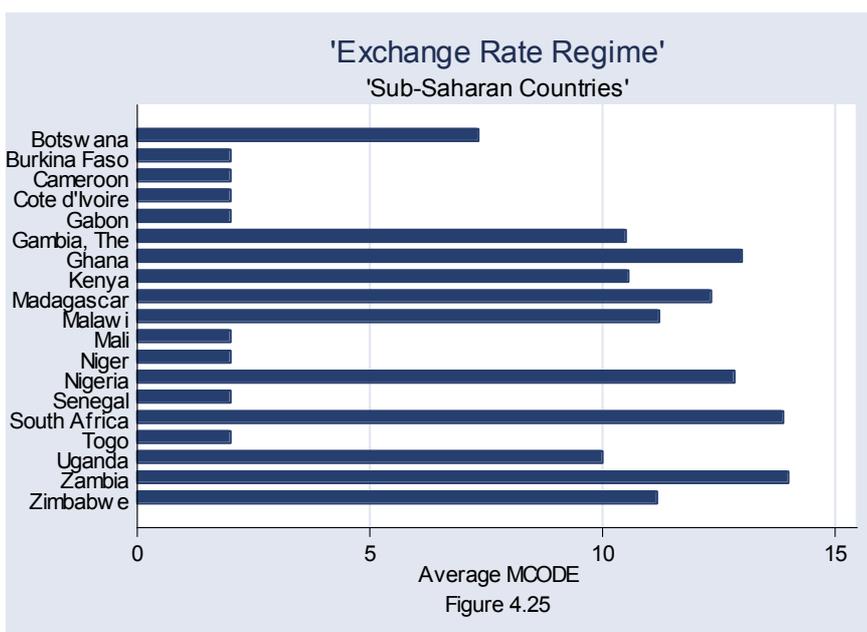
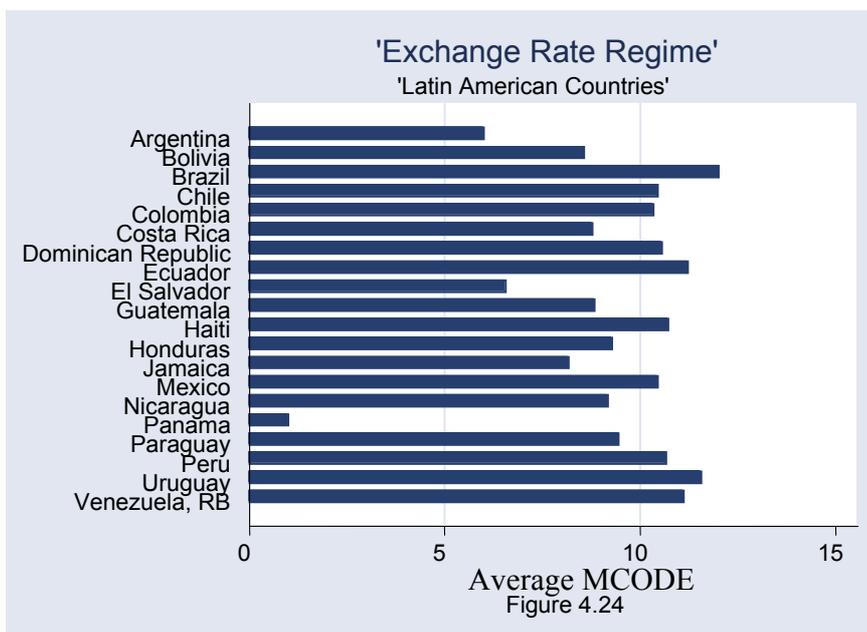


Figure 4.25 shows the exchange rate regimes of Sub-Saharan countries. South Africa, Zambia, Nigeria and Ghana have considerably flexible exchange rate regimes where Burkina Faso, Cameroon, Cote d'Ivoire, Gabon, Mali, Niger, Senegal and Togo are those with rigid exchange rate regimes.

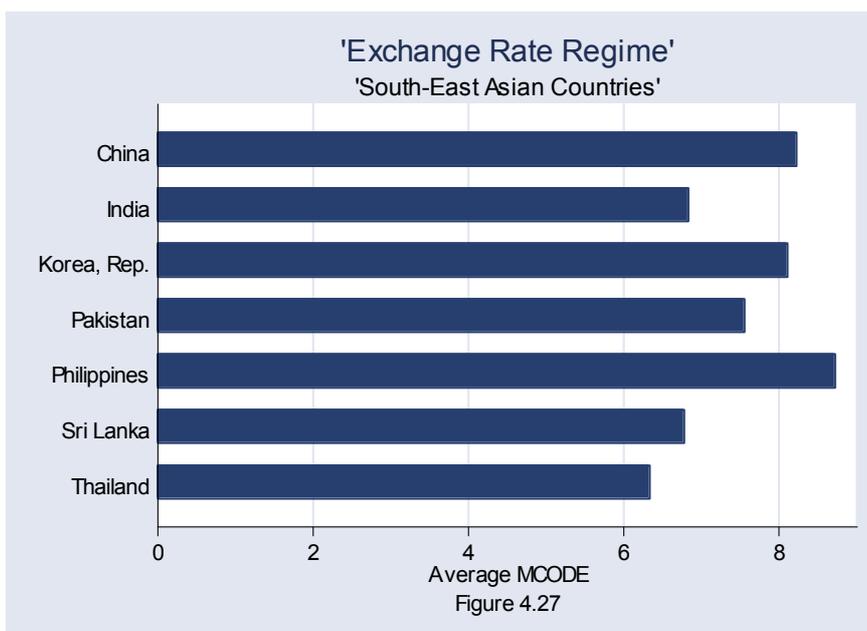
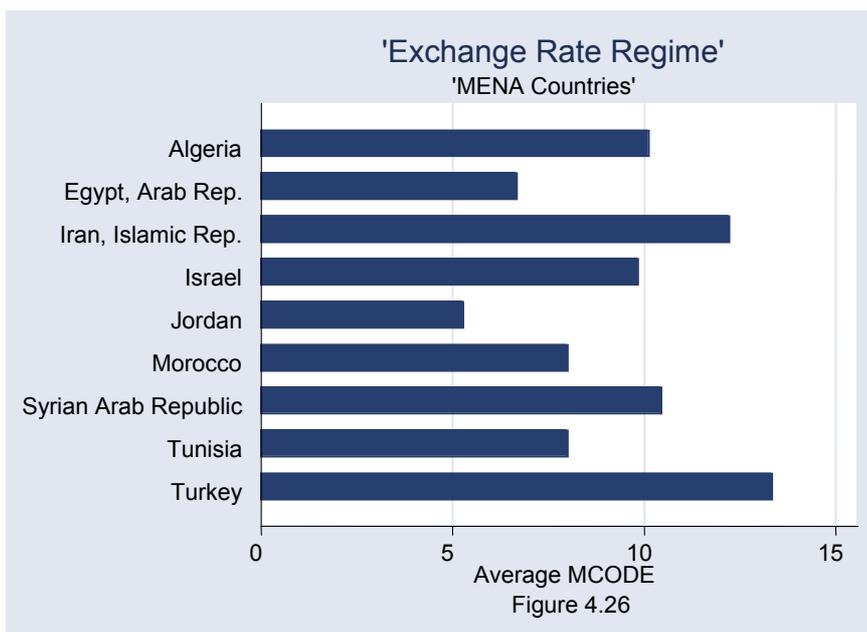
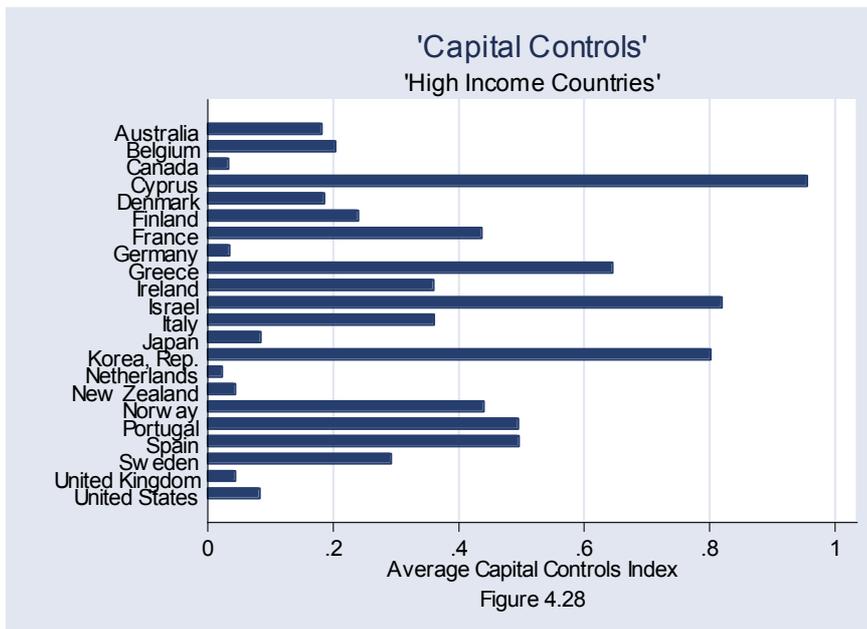


Figure 4.26 shows the exchange rate regimes of MENA countries. Among them, Turkey has the most flexible exchange rate regime throughout the period. On the other hand, looking at Figure 4.27, we observe that the South-East Asian countries have relatively less flexible exchange rate regimes compared to other developing world. The

annual classifications of exchange rate regimes for all countries in the sample are provided in Appendix C.

### 4.2.3. Capital Controls

We measure capital controls by constructing an index based on IMF's Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER). We take the average of dummies for different sub-categories capital controls. We draw on four sub-categories for the pre 1996 period while the post 1996 period covers fifteen different sub-categories of capital controls. The construction of capital controls index is described in detail in the model and methodology section of Chapter 6. Our index ranges between 0 and 1, higher values correspond to a higher degree of capital controls.



Figures 4.28 through 4.31 show average capital control index for countries classified according to the income level. These figures reveal that higher income

countries generally have lower capital control index. Figure 4.28 shows the average capital control index of high income countries for the period 1984-2001. As the figure indicates, except for Cyprus, South Korea, Israel and Greece, capital control index is lower than 0.6 for all countries. Lowest figures are of Canada, the Netherlands and Germany. In other words, the industrialized countries of Europe and North America have considerably low levels of capital controls.

Figure 4.29 gives capital control indices of upper middle income countries. As figure shows, except for Panama and Uruguay, capital control index is higher than 0.6 while the highest figure is of Chile. The figure for Panama is exceptionally low since Panama is tax-free heaven for international capital.

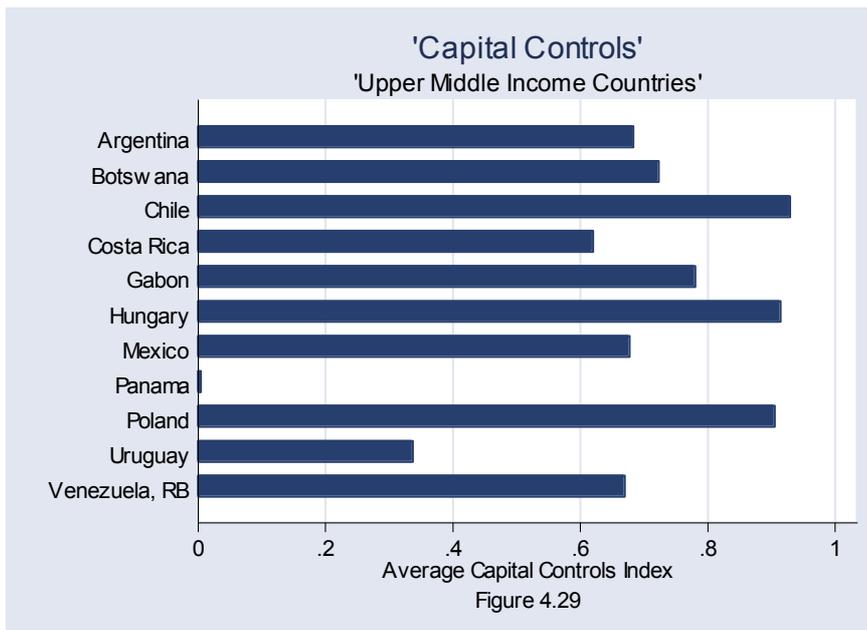


Figure 4.30 shows average capital control index for lower middle income countries. Average capital control index for half of the countries in the sample is higher than 0.8 while capital control indices of a majority of countries are higher than 0.6. Two

highest figures are of Iran and Syria (both equal to unity indicating full control on capital accounts) which are also politically isolated countries. The lowest figure is of Bolivia.

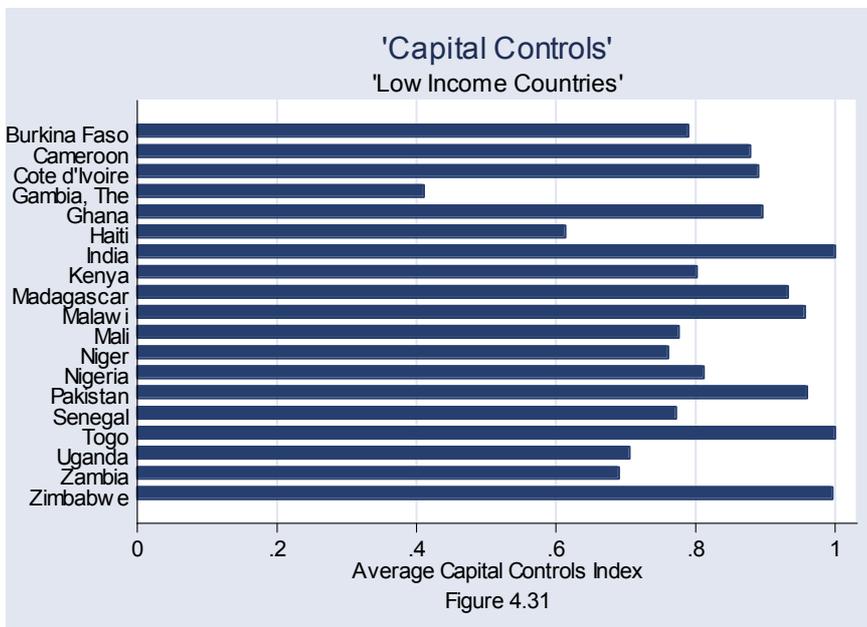
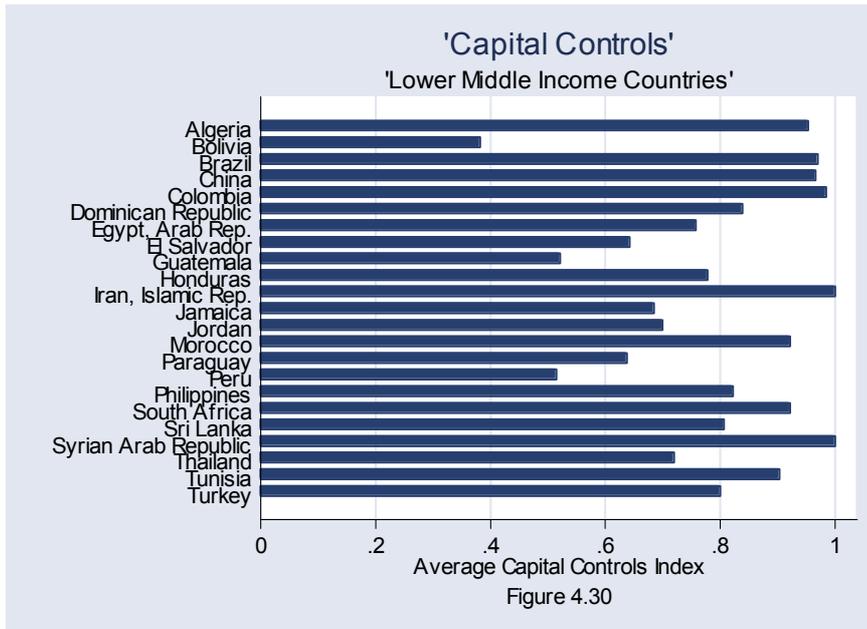
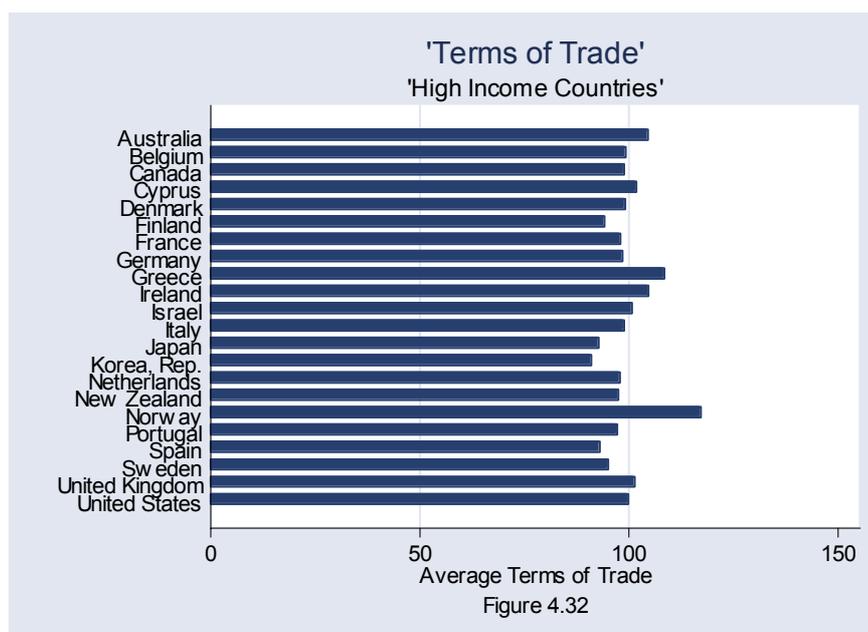
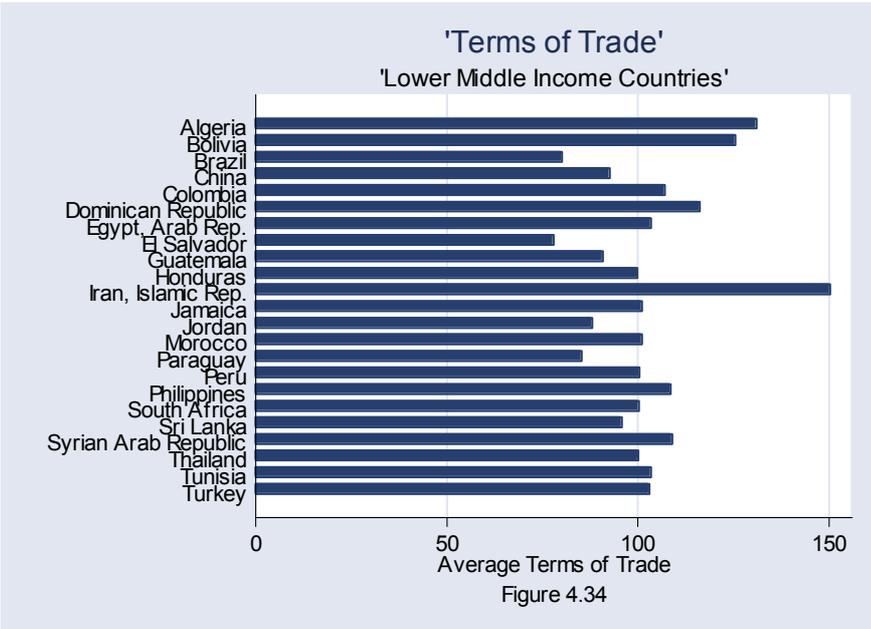
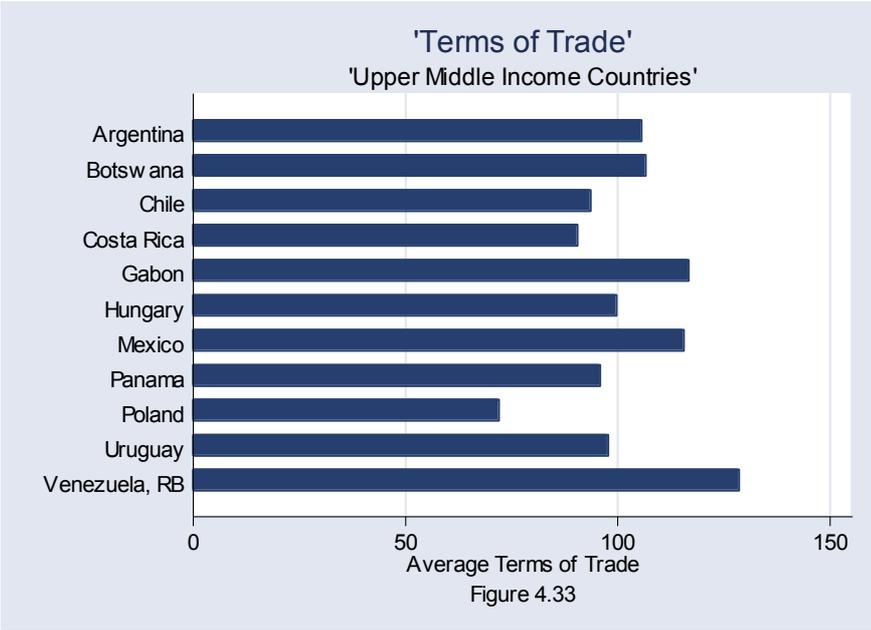


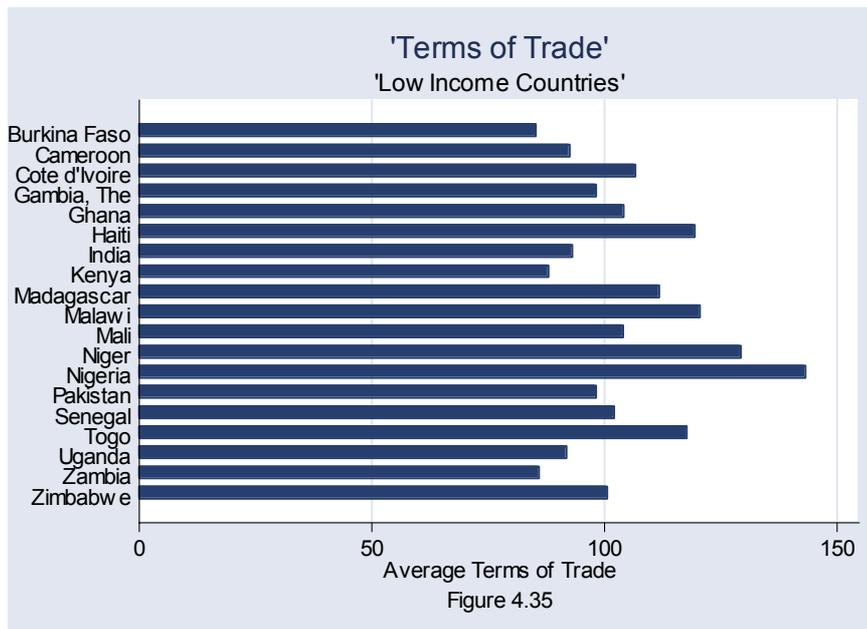
Figure 4.31 shows that only one country (Gambia) out of 19 low income countries has an average capital control index lower than 0.6 while 11 countries have an average capital control index higher than 0.8. The average capital control indices of India, Togo and Zimbabwe are equal to unity.

#### 4.2.4. Terms of Trade

The terms of trade index is the ratio of export price index to import price index. The figures below (Figure 4.32 through Figure 4.35) show the average terms of trade for different sub-samples classified according to the income level. Among the industrialized countries, the highest terms of trade ratio is that of Norway which is one the natural gas exporters. Figures also show that, countries with the highest terms of trade ratios are Venezuela, Iran, Nigeria and Algeria. This implies that the petroleum exporting countries have significantly high terms of trade ratios. These figures show that we do not observe large fluctuations in the whole period averages of the terms of trade ratios between countries except oil exporting countries. Rather, the terms of trade is highly volatile within a country through time.

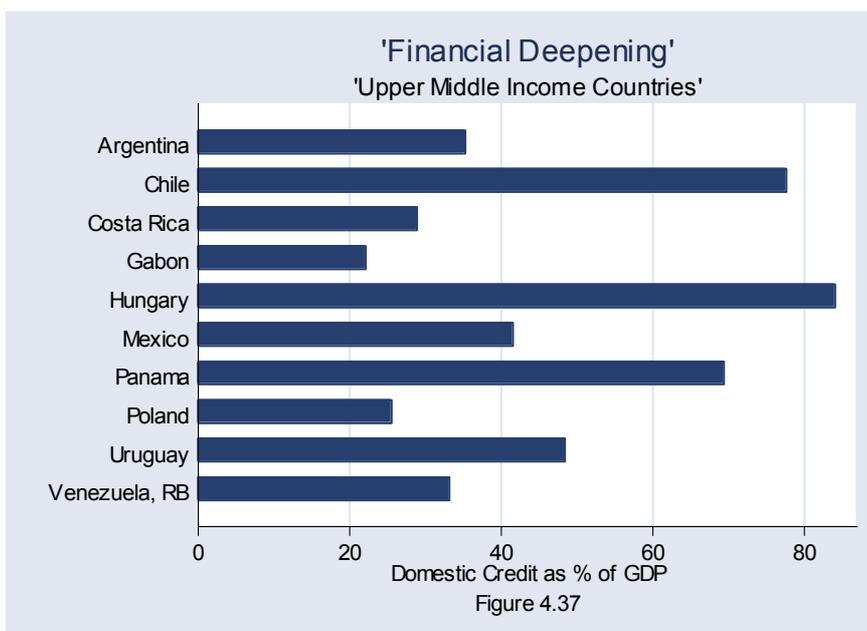
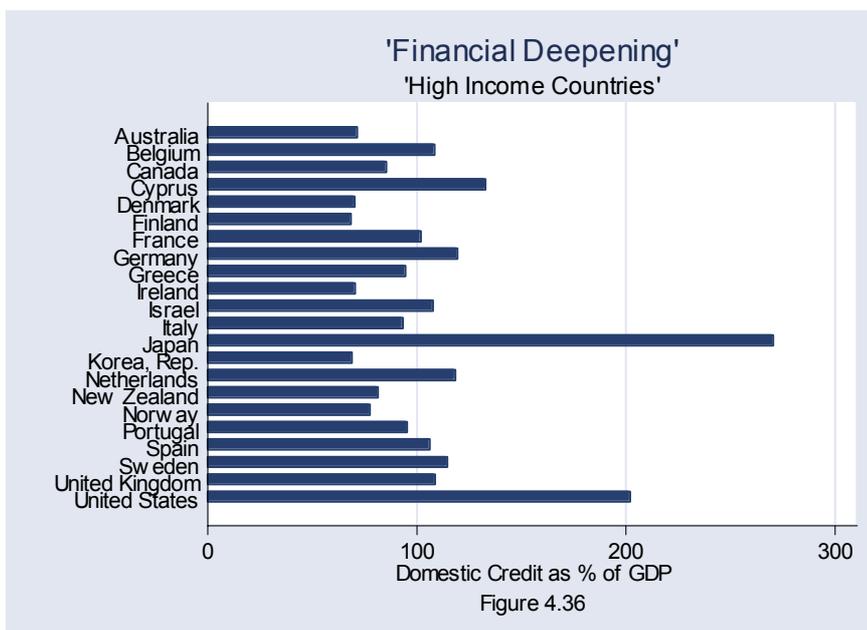






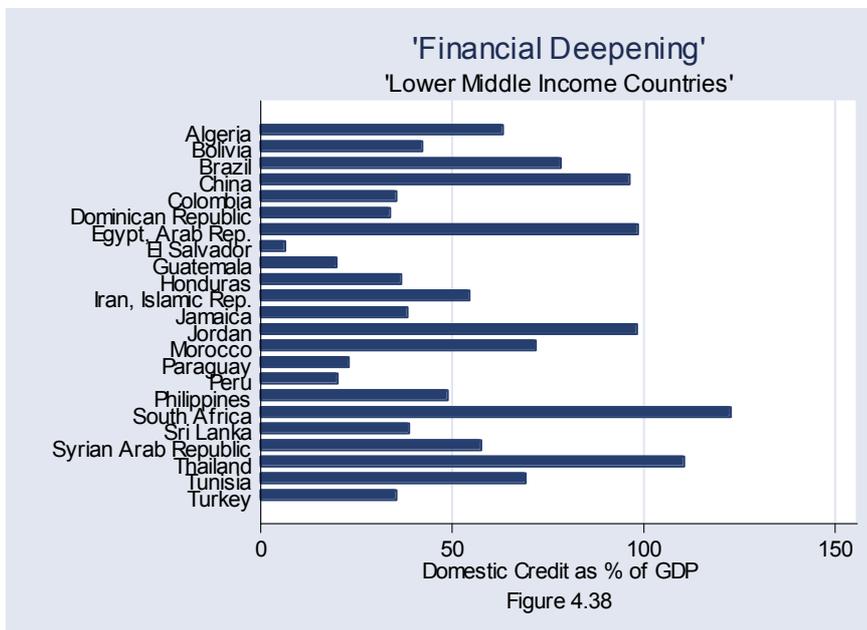
#### 4.2.5. Financial Deepening

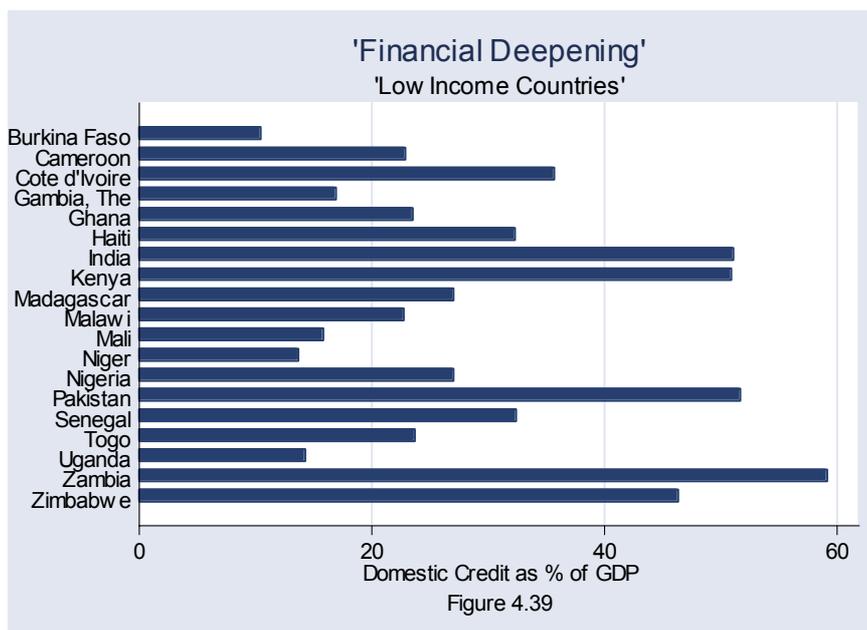
Financial deepening index for each country is the ratio of gross domestic credit provided by country's banking system to its GDP. It shows the availability of domestic credit opportunities. As figures from 4.36 to 4.39 shows, financial deepening increases with GDP. Figure 4.36 shows the average financial deepening index for high income countries. 10 countries in sample have average gross domestic credit figures more than their GDP. Moreover, in two of these countries, the volume of average annual gross domestic credit is more than twice their annual GDP. These two countries are Japan and United States.



As figures 4.37, 4.38 and 4.39 show, average annual financial deepening index for most of the upper and lower middle, and also low income countries are less than 50% while only two of them have an average annual financial deepening index more than 100%. Especially for the case of low income countries, the financial deepening index is

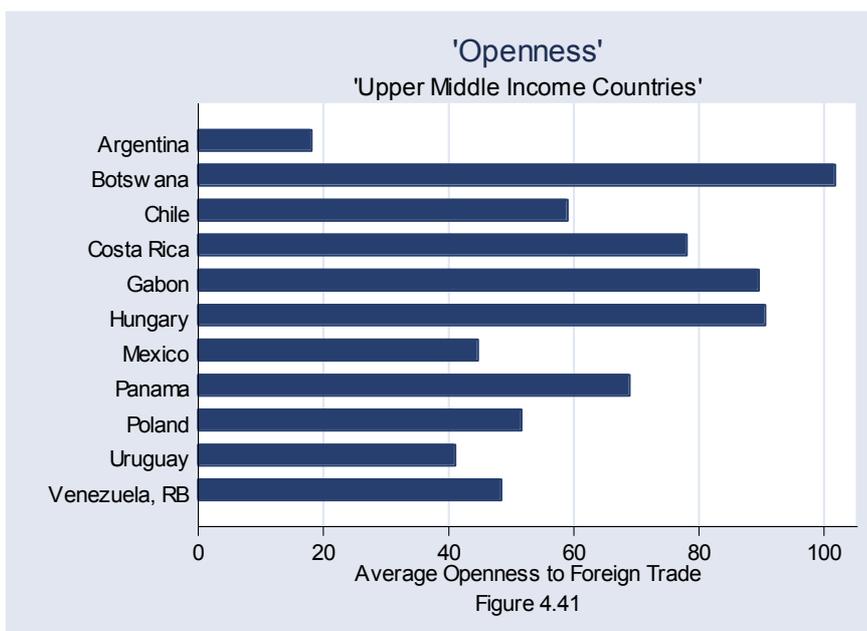
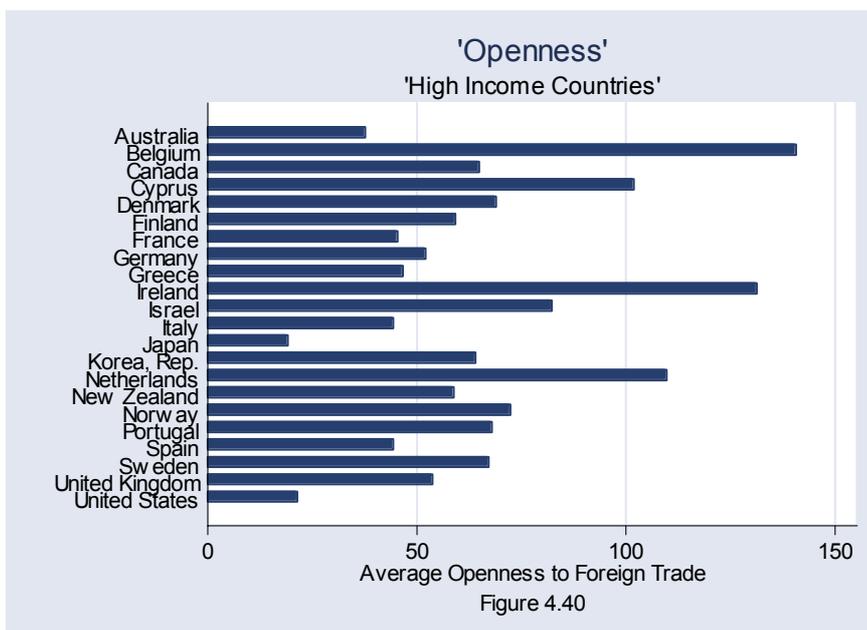
below 60 for all of the countries in the sample. This shows that the depth of the financial system is strongly related to the level of development. For example, even for the upper middle income countries, the financial deepening index hardly reaches to 50 if we exclude Chile, Hungary and Panama. Among the latter group of countries, Chile has a relatively deep and strong industrial set up and Hungary is an area of new investment opportunities for the investment saturated economies of Europe.





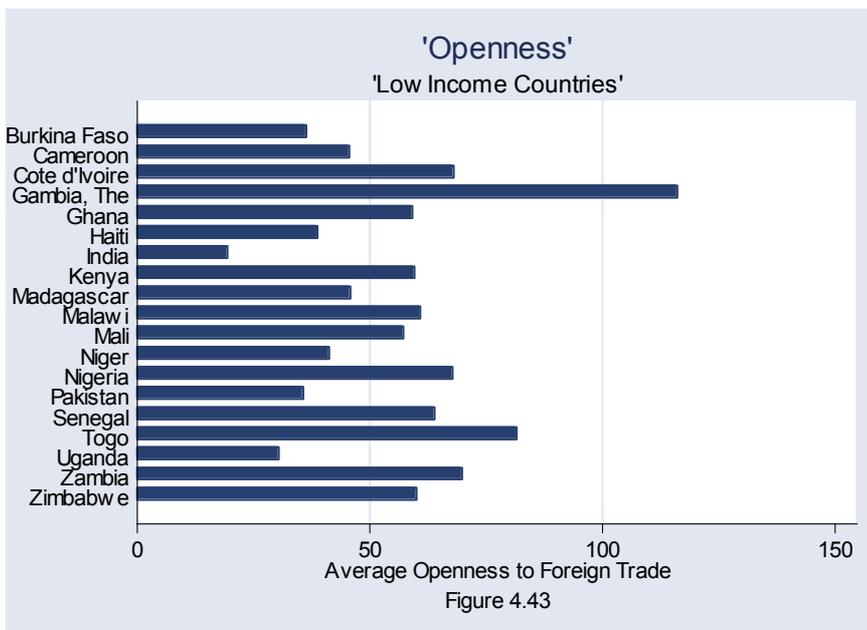
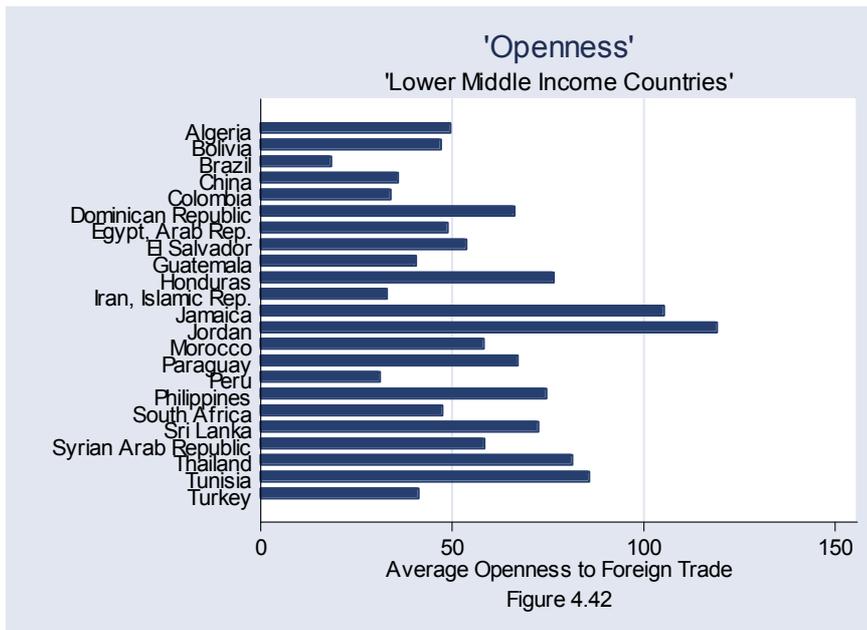
#### 4.2.6. Openness

Openness is defined as the ratio of the sum of exports and imports to GDP. In this sense, it shows the degree of articulation of national economy to the world economy. At first glance, it seems that it is directly related to the size of the country; as GDP grows between countries the degree of openness decreases. For example, as Figure 4.40 shows, Japan and USA have relatively low levels of openness while small economies like Belgium and Ireland have very high degrees of openness. Since it is mainly determined by country size, we can observe significant variations among countries. As Figure 4.40 shows, among high income countries, four countries have openness indices more than 100: Belgium, Cyprus, Netherlands and Ireland while Japan and USA have very low openness indices.



As Figure 4.41 shows, no country among upper middle income countries has an index over 100. Argentina has the lowest index because it is the largest economy in the sample. In Figure 4.42, Brazil has the lowest index which indicates its enormous size. Two of the countries, Jamaica and Jordan, have indices higher than 100. It is interesting

to note that Turkey has relatively low index. We can observe the same pattern in the sample of low income countries; having relatively higher size, India has the lowest openness index (Figure 4.43).



## CHAPTER 5

### MODEL, METHODOLOGY AND ESTIMATION RESULTS

#### 5.1. The Model and the Data

Our econometric model is specified as follows:

$$CAD_{i,t} = \alpha + \beta_0 CAD_{i,t-1} + \beta_1 GOV_{i,t} + \beta_2 ERR_{i,t} + \beta_3 CAPCON_{i,t} + \beta_4 TOT_{i,t} + \beta_5 OPENNESS_{i,t} + \beta_6 RER_{i,t} \\ + \beta_7 FINDEV_{i,t} + \beta_8 GDP_{i,t} + \varepsilon_{i,t}$$

The dependent variable is the current account deficit (CAD) defined as the ratio of the current account deficit to GDP. The explanatory variables are governance (GOV), exchange rate regime (ERR), capital controls (CAPCON), openness to foreign trade (OPENNESS), the real exchange rate (RER), level of financial development (FINDEV) and log of GDP (GDP).

In this section, we outline the variables we used in order to examine the dynamics of the current account balance. Empirical studies draw on a large set of variables as the determinants of the current account balance. For example, some studies include domestic output growth into the current account regressions. The domestic output growth is positively related to the current account deficit in the sense that a rise in investment is associated with a higher level of GDP and widening of current account deficit. An increase in the domestic output growth also leads to a rise in savings. On the other hand, any increase in the growth rate of GDP is mostly accompanied by an increasing level of debt, which means a rise in current account deficit. Calderon *et al.* (2002) report that the size of the coefficient is 0.33 and it is statistically significant. On the other hand, several studies analyze the impact of productivity shocks on the current account balance (Glick and Rogoff, 1995 and Reisen, 1998). However, the impact of a productivity shock depends on its degree of persistence (i.e. whether this shock is

transitory or permanent). For example, a permanent productivity shock may enlarge the current account deficit as a result of a rise in investment while a transitory shock may have a negative effect on the current account if it leads to a higher amount of saving following a rise in income which outweighs the increase in investment. On the other hand, empirical studies show that the impact of a country specific productivity shock is higher compared to that of a global shock (Glick and Rogoff, 1995). As the world can be thought as a closed economy, common or global shocks influence savings and investment in all countries.

The role of saving (whether it is public or private) as a factor determining the current account balance has been analyzed as well. Calderon et al. (2002) find out that an increase in public or private saving leads to a decline in the current account deficit. However, the coefficient of public saving is statistically significant while that of private saving is not. Moreover, the former is considerably greater (about 0.33) in size compared to the latter (0.09).

Empirical studies include investment into the current account regressions and show that investment is positively related to the current account deficit. Investment booms are associated with current account deficits (Nason and Rogers, 2002). Following a rise in productivity, investment increases resulting in widening of the current account. On the other hand, as there is a time lag for the adjustment of the capital stock, permanent income surpasses the current income. Hence, savings decline and lead to a further increase in the current account. Reisen (1998) reports that any increase in one period lagged investment is associated with widening of the current account deficit. Bussiere et al. (2004) find out that a one percent increase in investment results in 0.39 percent decline in the current account balance.

Some studies incorporate the world interest rate as a determinant of the current account balance. The impact of the world interest rate depends on the net foreign asset position of a country. In an intertemporal setting, a fall in world interest rate leads to a decline in the current account deficit for a net debtor country since net factor incomes (which are negative for a net debtor country) decrease. On the other hand, for a net creditor country, a fall in the world interest rate results in a reduction in net factor incomes and, thus, worsening of the current account balance. However, Calderon et al.

(2002) find a negative relationship between world interest rate and the current account deficit for a sample of developing countries.

While analysing the current account dynamics of developing countries, some empirical studies incorporate the industrialized countries growth rate on the grounds that, the current account balances of developing countries considerably responds to the growth rate of industrialized country output. A rise in the growth rate of output of industrialised countries results in a decline in the current account deficit implying a higher demand for developing country exports. Calderon et al. (2002) report a negative relationship between the current account deficit and the industrialized country growth rate.

Several studies introduce the age dependency ratio as a proxy for demographic factors. Age dependency ratio is defined as the ratio of dependents (younger than 15 and older than 64) to the working age population. A high dependency ratio implies a low level of national saving as only the population at working age saves. Thus the dependency ratio is positively related to the current account deficit. Chinn and Prasad (2003) differentiate between young dependency ratio and old dependency ratio and conclude that both of these variables are negatively related to the current account balance as the theory predicts although the coefficients are not statistically significant.

The stock of net foreign assets serves as an important initial condition. Kraay and Ventura (2000) argue that the response of the current account balance to a transitory income shock depends on the net foreign asset position of that country. By multiplying the change in savings generated by the shock and the share of foreign assets in total assets, they find the impact of the income shock on the current account. Theory predicts a positive correlation between net foreign asset position and the current account balance. Empirical studies show a strong positive correlation between the stock of net foreign assets and the current account balance (Chinn and Prasad, 2003). On the other hand, the standard deviation of inflation can be used as a proxy for macroeconomic uncertainty. We expect a negative relationship between the current account deficit and macroeconomic uncertainty because macroeconomic uncertainty lowers investment and rises precautionary saving. Empirical studies report a negative association between macroeconomic uncertainty and the current account deficit (Calderon et al., 2002)

In our model, we use the following explanatory variables in order to investigate the current account dynamics. We obtain the data for all the explanatory variables except capital controls from World Bank, World Development Indicators. For the capital controls index, we draw on IMF's Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER). While calculating the real exchange rate, we depend on nominal exchange rate and consumer price index data taken from World Bank, World Development Indicators. For the data on exchange rate regimes, we draw on the dataset constructed by Reinhart and Rogoff (2002).

**Persistence:** The lagged value of the current account deficit is expected to be positively related to the current account deficit. Empirical studies indicate a moderate level of persistence which is consistent with the stationarity of current account deficits. Reisen (1998) finds that the coefficient of the lagged current account variable is 0.60 while Calderon et al. (2002) reports a positive coefficient which is approximately 0.54. This implies that the impact of a transitory shock to the current account persists for around two periods.

**Growth rate of GDP:** We use the log of GDP at PPP. The PPP GDP is the gross domestic products converted to international dollars using purchasing power parity rates. We expect a positive relationship between the GDP growth and the current account deficit in the sense that, high growth rates are associated with widening current account deficits as a result of increased investment. Such income variables also reflect the "stages of development hypothesis" which indicates that the current account deficits decrease as the country develops with respect to the rest of the world. At the early stages of development, a country imports capital and relies on external borrowing in order to finance investment because of the low levels of national saving. Hence, a low income country runs high current account deficits in order to finance its investment opportunities. However, as the country develops, it requires less external financing thus it is negatively related to the current account deficit. As the country reaches a certain level of development, it begins to run current account surpluses in order to pay its accumulated external debt. On the other hand, the log of GDP can be used as a proxy to the country size. We expect a negative relationship between country size and the current account deficit. A high markets size leads to an increased total demand for assets and

higher asset prices. There is also equity home bias in the sense that investors hold a disproportionate amount of domestic equities. Hence, domestic savings are retained in the home country in order to finance domestic investment leading to a lower level of current account imbalances. Equity home bias depends on transaction costs and imperfect financial markets (Martin and Rey, 2004). We can also define the country size variable as the ratio of GDP at PPP to that of USA for each country. This country size index, measured as the income of a country relative to that of USA, varies between 10 and 100 where the latter corresponds to USA.

**Terms of trade:** The terms of trade ratio is the log of the ratio of export price index to the import price index measured relative to the base year 1995. Harberger-Laursen-Metzler effect indicates that adverse transitory terms of trade shocks result in a decline in current income which is greater than permanent income. Hence, deterioration of the terms of trade leads to a decline in savings out of any given level of income. Therefore, as a result of a decrease in savings the current account position deteriorates which is called as the Harberger-Laursen-Metzler effect (Harberger, 1950 and Laursen and Metzler, 1950). The Harberger-Laursen-Metzler effect is negative in the sense that the current account deficit increases following deterioration in the terms of trade. Thus, we expect that terms of trade ratio is negatively related to the current account deficit. The terms of trade volatility can also be analyzed as a determinant of the current account balance. The relatively more volatility in the terms of trade may induce precautionary saving in order to smooth their consumption and improves the current account balance.

**Budget deficit:** Theoretical models predict a positive relationship between budget balances and the current account balances. Any increase in government budget balance implies a rise in public saving which leads to an increase in national saving in the absence of full Ricardian offset by private savings. Therefore, the current account balance increases as a result of the increase in the budget balance. Empirical studies find a strong positive correlation between budget balance and the current account balance (Chinn and Prasad, 2003). In the same manner, a budget deficit is generally associated with a current account deficit which is called as twin deficits. Bussiere *et al.* (2004) find that fiscal surplus is positively and significantly related to the current account balance.

The co-movement of the budget and current account deficits supports the twin deficits hypothesis.

**Degree of openness:** The degree of openness is proxied by the ratio of the sum of exports and imports to GDP. The sign of the relationship between the current account and the degree of openness is ambiguous. The degree of openness may lead to a higher current account deficit in the sense that the relatively more open economies may service external debt through the earnings of foreign exchange by way of exports. Countries that are more open to international trade attract relatively more foreign capital. When we examine the impact of openness on saving and investment, we observe that the degree of openness is positively correlated to investment especially in developing countries. On the one hand, this may be due to increasing capital goods imports that are devoted to investment. On the other hand, widening export base which shifts towards the industrialised products provides new investment opportunities. Empirical studies find a positive relationship between the degree of openness and the current account deficit (Chinn and Prasad, 2003).

**Real exchange rate:** An increase in the real effective exchange rate implies a real appreciation of the domestic currency. Real effective exchange rate is positively related to the current account deficit as far as Marshall Lerner condition holds. In other words, appreciation of the domestic currency leads to an increase in imports and decline in exports worsening the current account deficit. The real exchange rate is calculated as deviations from purchasing power parity by the following formula (we take the US price level as foreign price level):

$$RER = \Delta e + \Delta p^* - \Delta p$$

**Capital controls:** We expect a negative relationship between capital controls and the current account deficit. Capital controls put restrictions on capital inflows and thus lead to a contraction of the current account deficits. However, in some cases, capital controls are imposed in order to alleviate the chronic current account deficits. Calderon et al. (2002) use black market premium as a proxy for capital and current account controls. On the other hand, the balance of payments controls involve three types of restrictions: restrictions on capital transactions, multiple exchange rate practices and restrictions on current account transactions. Balance of payments controls are positively

related to the current account deficit although it is not significant. Capital controls may bring lower current account deficits as they signal a limited external financing. At the same time capital controls may be imposed following large and sustainable current account deficits.

There is a broad literature on the measurement of capital controls. Most of them depend on the Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER) published by IMF. The content and scope of the AREAER data about capital controls has been broadened in 1996. The pre-1996 data contain a single dummy which represents restrictions on payments for capital transactions. On the other hand, the post-1996 data includes thirteen sub-categories of capital controls. These consist of controls on 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 and personal capital movements, provisions specific to commercial banks and other credit institutions and institutional investors. Miniane (2004) extends the post-1996 capital account indices depending on the AREAER for a sample of 34 countries. On the other hand, Chinn and Ito (2005) construct a data set for capital controls depending on four binary dummies from the AREAER; the presence of multiple exchange rates, restrictions on current account transactions, restrictions on capital account transactions, requirement of the surrender of export proceeds. The Chinn-Ito index differs from other calculations of capital controls on the grounds that it takes both the extent and the intensity of capital controls into account. We calculate the capital control variable by taking the average of dummies for 4 subcategories for the pre-1996 period and 15 subcategories for the post-1996 period. We include the dummies for repatriation and surrender requirements as these restrictions are likely discourage foreign direct investment (Tamirisa, 1999).

***Financial deepening:*** Financial deepening is proxied as the ratio domestic credit provided by the banking sector to GDP. It represents the depth and the sophistication of a financial system. On the one hand, a more sophisticated financial system may induce a higher amount of national saving and thus the current account deficit declines with the increasing level of financial deepening. On the other hand, the financial deepening

variable can be interpreted as a measure of borrowing constraints that a country faces. The consumption smoothing behaviour of economic agents depends on their ability to borrow. Therefore, borrowing constraints tend to play an important role in intertemporal saving and consumption decisions of agents. If there are borrowing constraints, households will not be able to increase the present consumption even if they prefer to do and national savings increase as, in such a case, it would be more costly for households to smooth consumption over time. The stringency of borrowing constraints declines with the financial deepening of an economy. In such a case, national savings decrease with the improvement of the latter. Thus, a relatively more sophisticated financial system may be associated with a widening of the current account deficit. The net effect is ambiguous. Chinn and Prasad (2003) show that financial deepening is positively and significantly related to the current account balance. Empirical studies show a positive correlation between private savings and the financial deepening variable. Such a positive correlation indicates that the financial deepening variable is a poor proxy for borrowing constraints (Edwards, 1995).

***Exchange rate regime:*** The IMF classification of exchange rate regimes is “de jure” classifications in the sense that these classifications depend on what countries admit about the exchange rate regime they would adopt. Hence, these classifications do not capture the deviations from the presupposed exchange rate regimes. On the other hand, the “de facto” classifications reveal the actual behaviour of countries regarding the exchange rate regime adopted. In this study, we draw on the “de facto” exchange rate regime classifications compiled by Reinhart and Rogoff (2004). Reinhart and Rogoff (2004) make two distinct classifications, a fine and a coarse classification where the former includes a broader set of classification codes (varying between 1 and 15) compared to the latter which takes a value between 1 and 6. Higher values of the classification codes indicate relatively more flexible exchange rate regimes. In our study, we use the fine classification code.

***Governance:*** Governance and institutional quality have a prominent role for the current account dynamics of countries. Better governance and strong institutions are conducive to higher investment and growth. Thus, countries with better governance can accommodate higher current account imbalances as these countries attract capital

inflows utilized to finance higher investment opportunities. We use the International country risk guide, which encompasses 22 variables from three sub-categories: political, financial and economic risk. The index ranges between 0 and 100 where higher values indicate relatively lower levels of risk, a rating less than 50 being a sign of very high risk.

**Table 5.1: Simple Correlation Coefficients**

	CAD	ICRG	ERR	TOT	RER	CAPCON	GDP	FINDEV	OPEN
CAD	1								
GOV	-0.26	1							
ERR	-0.07	-0.10	1						
TOT	-0.12	-0.19	0.12	1					
RER	0.16	-0.51	0.22	0.13	1				
CAPCON	0.11	-0.61	0.13	0.14	0.46	1			
GDP	-0.28	0.49	0.18	-0.05	-0.31	-0.28	1		
FINDEV	-0.14	0.47	0.11	-0.08	-0.35	-0.31	0.61	1	
OPEN	-0.09	0.22	-0.24	-0.05	-0.19	-0.06	-0.37	-0.05	1

Table 5.1 shows the simple correlation coefficients of our variables. On the other hand, Table 5.2 shows the summary statistics for the explanatory variables. We observe that the standard deviation of the governance data is considerably higher for the between data compared to the within data. This is quite reasonable as the quality of institutions and governance differs among countries while one does not observe a significant change in the institutional set up within time for a country in the short run. In the same manner, the standard deviation of the between data is higher than that of the within data for most of the variables except the terms of trade. Especially for the financial deepening index, the between country variation is considerably larger than the within country variation. The depth of the financial system shows diverging patterns between countries according to the level of development. In the same way, the between country variation is significantly large compared to the within country variation for openness index. On the other hand, the terms of trade ratio displays larger fluctuations within countries. The

latter finding indicates the volatility of the terms of trade for most of the countries, especially the primary goods exporters.

**Table 5.2: Summary Statistics**

		Mean	Std. Dev.	Min	Max	Observations
CAD	overall	2.08	4.87	-31.98	31.07	N =1314
	between		3.17	-8.56	10.05	n =76
	within		3.74	-21.34	31.36	T-bar =17.2895
ICRG	overall	65.31	13.75	27.00	92.50	N =1339
	between		11.55	43.38	87.96	n =76
	within		7.59	37.10	84.65	T-bar =17.6184
MCODE	overall	8.36	4.20	1.00	15.00	N =1363
	between		3.48	1.00	14.00	n =76
	within		2.39	-1.86	16.36	T-bar =17.9342
TOT	overall	102.71	23.13	31.05	283.00	N =1335
	between		13.78	72.05	150.30	n =76
	within		18.62	40.49	242.49	T-bar =17.5658
RER	overall	3.36	3.02	-0.79	15.95	N =1338
	between		2.88	-0.62	12.03	n =76
	within		0.95	-0.74	11.31	T-bar =17.6053
CAPCON	overall	0.64	0.37	0.00	1.00	N = 1366
	between		0.30	0.00	1.00	n = 76
	within		0.22	0.20	1.26	T-bar = 17.9737
GDP	overall	25.00	1.82	20.89	29.81	N =1350
	between		1.82	21.17	29.57	n =76
	within		0.19	24.19	25.75	T-bar =17.7632
FINDEEP	overall	61.73	48.79	-77.38	320.56	N =1352
	between		45.86	-46.53	270.33	n =76
	within		17.33	-3.04	186.15	T-bar =17.7895
OPEN	overall	60.57	27.86	8.96	182.43	N =1360
	between		25.78	18.15	140.65	n =76
	within		10.91	20.32	123.60	T-bar =17.8947

## 5.2. Methodology

Traditional panel data estimations, either with fixed or random effects, assume a strong exogeneity of explanatory variables. However, this assumption is very strict in the sense that any unobserved correlation between the error term and any explanatory variable make test statistics questionable. Such a correlation naturally brings about joint endogeneity.

The dynamic panel data estimations of equations of which right hand side contains lagged dependent variable is very likely to be prone to the problem of joint endogeneity. For example, consider the following regression equation:

$$y_{it} = \beta_1 y_{it-1} + \beta_2 X_{it} + u_{it} \quad i=1, \dots, N \quad t=1, \dots, T \quad (1)$$

in which

$$u_{it} = \eta_i + v_{it} \quad i=1, \dots, N \quad t=1, \dots, T \quad (2)$$

Where, in our model,  $y_{it}$  is current account deficit/GDP ratio,  $X_{it}$  refers to the set of explanatory variables,  $\eta_i$  is the set of country-specific factors and  $v_{it}$  is a white noise process. We assume that;  $\eta_i \square IID(0, \sigma_\eta^2)$  and  $v_{it} \square IID(0, \sigma_v^2)$ ; and they are independent of each other. Baltagi (1995), in this context, underlines the problems of traditional panel data methods. Since the right hand side consists of a lagged dependent variable,  $y_{it-1}$ , which is also correlated with country-specific factors,  $\eta_i$ , standard OLS estimator will be biased and inconsistent (Baltagi, 1995:125). Moreover, some right hand side variables may be correlated with,  $v_{it}$  even if it is not serially correlated.

In order to tackle with these problems, a number of dynamic panel data estimation methodologies, of which the most prominent ones are Arellano and Bond (1991), and Arellano and Bover (1995), were devised. We will use Arellano-Bond type GMM estimation in our study. In our case, in order to compute Arellano and Bover's GMM estimator, we should take the difference of (1);

$$y_{it} - y_{it-1} = \beta_1 (y_{it-1} - y_{it-2}) + \beta_2 (X_{it} - X_{it-1}) + (v_{it} - v_{it-1}) \quad (3)$$

where the GMM estimator of (3) requires appropriate instrumental variables. Differencing (1) solves the problem of country-specific factors i.e.  $\eta_i$  is eliminated in

(3). However we should define some orthogonality conditions among the disturbances  $v_{it}$  and explanatory variables. Since the GMM estimator is as follows;

$$\begin{pmatrix} \beta_1 \\ \beta_2 \end{pmatrix} = [(\Delta y_{-1} \Delta X)' W V_N^{-1} W' (\Delta y_{-1} \Delta X)]^{-1} [(\Delta y_{-1} \Delta X)' W V_N^{-1} W' \Delta y_{-1}] \quad (4)$$

where

$$V_N = \sum_{i=1}^N W_i' (\Delta v_i) (\Delta v_i)' W_i$$

$W$  is the matrix of instrumental variables i.e.  $W = [W_1' \dots W_N']'$  and moment equations as;

$$E(W_i' \Delta v_i) = 0 \quad (5)$$

In selecting the appropriate instrument variables, following Calderon (2002), we put the assumptions that a)  $v_{it}$  is not serially correlated, and b) the explanatory variables are weakly exogenous in the sense that (as outline by Calderon (2002:8);

$$E[y_{i,t-s} (v_{it} - v_{it-1})] = 0 \text{ for } s \geq 2 \text{ } t = 3, \dots, T \quad (6)$$

$$E[X_{i,t-s} (v_{it} - v_{it-1})] = 0 \text{ for } s \geq 2 \text{ } t = 3, \dots, T$$

By applying this restrictions, we can obtain  $W$ , instrumental variable matrix. However, if all the explanatory variables in the set of  $X$  are not correlated with  $v_{it}$  i.e. they are strictly exogenous such that;

$$E(x_{it}, v_{is}) = 0 \text{ } t, s = 1, 2, \dots, T$$

If they are correlated with  $\eta_t$ , then all the  $x_{it}$ 's are valid instruments for (3). If they are predetermined;

$$E(x_{it}, v_{is}) \neq 0 \text{ for } s > t, 0 \text{ otherwise.}$$

In this situation only,  $[x_{i1}, x_{i2}, \dots, x_{i(s-1)}]$  are instrumental variables (Baltagi, 1995).

Arellano and Bond (1991), and Arellano and Bover (1995) proposed two specification tests for this panel data estimation method. First test is Sargan test of over-identifications; it is used to test the significance of instruments. Second test is used to check for the serial correlation in  $v_{it}$ .

### 5.3. Estimation Results

We estimate the following model for a set of 76 countries including both developed and developing ones for the period 1984-2001.

$$CAD_{i,t} = \alpha + \beta_0 CAD_{i,t-1} + \beta_1 GOV_{i,t} + \beta_2 ERR_{i,t} + \beta_3 CAPCONT_{i,t} + \beta_4 TOT_{i,t} + \beta_5 OPENNESS_{i,t} + \beta_6 RER_{i,t} \\ + \beta_7 FINDEV_{i,t} + \beta_8 GDP_{i,t} + \varepsilon_{i,t}$$

The country risk variable (GOV) covers 22 variables from political, economic and financial subcategories of risk. The composite risk rating ranges from 0 to 100; an increase in the score implies a fall in the risk. The scores below 50 indicate very high risk whereas the scores between 80 and 100 imply a very low level of risk. The exchange rate regime variable (ERR) takes the values between 1 and 15 where the exchange rate flexibility increases with higher values of the exchange rate regime variable. Capital controls variable (CAPCON) is the average of 13 subcategories in the Annual Report on Exchange Arrangements and Exchange Restrictions published by IMF. Higher values of the capital control variable indicate the existence of capital controls. Openness (OPENNESS) is expressed as the ratio of the sum of exports and imports to GDP. Financial deepening (FINDEV) is measured by the ratio of domestic credits provided by the banking sector to GDP. Size is proxied by GDP at purchasing power parity.

Table 5.3 shows the estimation results for four full sample and different subsamples. We use the GMM two step estimation method by introducing the lagged values of all explanatory variables and the dependent variable as instruments. Sargan test does not reject the validity of instruments for all regressions. On the other hand, diagnostics show that there is no second order auto correlation for all regressions. The coefficient of the lagged value of the current account deficit is positive and significant. The size of the coefficient is estimated around 0.32 for the whole sample, which indicates that the current account is stationary. On the other hand, the size of the coefficient reveals that transitory shocks to the current account show a low degree of persistence implying that the half life of these shocks is less than one year<sup>9</sup>. Thus, the speed of convergence is high where the degree of persistence is low. Taylor (2002) states that a high level of the

---

<sup>9</sup>Half life of the transitory shocks is estimated using the following formula,  $\ln(0.5) / \ln(\beta)$ , where  $\beta$  is the coefficient of the lagged current account deficit.

persistence parameter implies that the country, having a flexible current account, can run persistent current account surpluses and deficits. On the other hand, high if the persistence parameter is small, the country has a rigid current account and the deviations from balance are hard to sustain. Hence, transitory shocks to the current account are short lived in the sense that deviations in the current account balance do not persist and the current account converges to its long run path. The high frequency of current account reversals especially within the developing countries indicates that the current account deficits are not persistent and subject to reversal. Previous empirical studies report a moderate degree of persistence. Debelle and Faruqee (1996) find the coefficient of the lagged current account deficit as 0.67 whereas Chinn and Prasad (2003) report it as 0.57. Other empirical studies find out similar results (Reisen (1998) reports 0.50 and Calderon et al. (2002) estimate 0.54). The persistence parameter is high in the sub-sample of industrialized countries, showing that these countries can run persistent current account surpluses or deficits. In fact, industrialized countries can sustain persistent current account deficits without facing with sudden stops or current account reversals. Empirical studies show that the lowest incidence of reversals occurs in industrialized countries (Edwards, 2004b). On the other hand, the degree of persistence parameter is lowest for the sub-sample of developing countries excluding Africa. This results show that the developing countries are prone to face with sudden stops and current account reversals: thus, they have difficulties in sustaining high amounts of current account imbalances. The coefficient of the persistence parameter is significant for all sub-samples.

The coefficient of the governance variable is positive and significant, estimated at around 0.08 for the whole sample. The higher values of the composite risk rating imply lower values of risk, better governance and strong institutions. Results show that better governance is associated with higher current account deficits. This is in line with the theory which states that the countries with relatively lower risk are able to bear higher current account deficits. Better governance and strong institutions increase the capacity to sustain higher levels of current account deficits. On the one hand, countries with better governance and strong functioning of institutions attract foreign direct investment as capital moves to the countries with lower risks. On the other hand, domestic investment increases in line with the credibility of institutional setup;

confidence on governance and the functioning of institutions, decreasing the uncertainty about the economic environment, guarantees the fully utilization of investment opportunities. The coefficient of governance variable is positive and significant for all sub-samples except industrialized countries. For the industrialized countries, the sign of the coefficient is negative although it is insignificant. The governance variable does not show wide variations among the industrialized countries. Most of these countries are the ones with low risk, better governance and strong institutions. Thus, we do not expect the coefficient of the governance variable to be significant as there is commonality among industrialized countries as far as the governance and the institutional set up are considered.

The coefficient of the exchange rate regime is negative and significant for full sample implying that relatively more flexible exchange rate regimes result in smaller current account deficits. Fixed exchange rate regimes lead to the overvaluation of the real exchange rate and higher current account deficits. On the other hand, with flexible exchange rates, countries can more easily accommodate to the external shocks (Edwards, 2004a, 2004b). Exchange rate adjusts in case of external disequilibrium and acts as a buffer against external shocks. Hence, flexible exchange rate regimes put a discipline on the current account balance by preventing the overvaluation of domestic currency. The coefficient of the exchange rate regime variable is also significant for the full sample excluding Sub-Saharan Africa. However, for separate regressions of industrialized countries and developing countries, we observe that the relationship between the exchange rate regime and the current account deficit is not significant.

The relationship between the terms of trade and the current account is negative and significant for full sample and all sub-samples. This result supports the Harberger-Laursen-Metzler effect, that is, deterioration in the terms of trade results in a decline in the current income and savings. Hence, following the deterioration of the terms of trade, the current account deficit widens. Calderon et al. (2002) finds a negative and significant relationship between the terms of trade and the current account deficit. On the other hand, Chinn and Prasad employ the terms of trade volatility and find a negative relationship between this variable and the current account deficit. However, this

relationship is significant only for the sample excluding Africa. Other empirical studies report similar findings (see Debelle and Faruquee, 1996 and Reisen, 1998).

**Table 5.3: Estimation Results**

	Full Sample	Industrialized Countries	Developing Countries (Excluding LDCs)	Developing Countries (Including LDCs)	Full Sample (Excluding Sub-Saharan Africa)
Constant	-0.857** (0.042)	-0.136 (0.281)	-1.260** (0.14)	-0.816** (0.105)	-0.778** (0.08)
Lagged Cad	0.318** (0.004)	0.449** (0.156)	0.290** (0.02)	0.337** (0.017)	0.416** (0.012)
GOV	0.082** (0.007)	-0.024 (0.058)	0.088** (0.014)	0.095** (0.014)	0.045** (0.009)
ERR	-0.068** (0.014)	0.000 (0.089)	0.009 (0.042)	-0.041 (0.032)	-0.133** (0.011)
TOT	-0.100** (0.002)	-0.121** (0.037)	-0.094** (0.007)	-0.090** (0.005)	-0.078** (0.003)
RER	-0.305** (0.097)	0.663 (1.751)	-1.079** (0.34)	-0.494+ (0.279)	-0.429* (0.202)
CAPCONT	0.437 (0.32)	1.962 (4.333)	-1.823+ (1.037)	1.218 (0.804)	0.438 (0.386)
GDP	19.615** (1.282)	2.738 (9.156)	25.621** (4.278)	15.745** (2.896)	18.809** (2.581)
FINDEV	0.033** (0.005)	0.019** (0.007)	0.049** (0.01)	0.032** (0.009)	0.012** (0.003)
OPENNESS	-0.009* (0.004)	-0.033+ (0.019)	-0.054** (0.01)	-0.002 (0.007)	-0.010* (0.005)
Observations	1053	299	643	754	819
No. of countries	76	21	45	55	57
Sargan Test	68.64(1.00)	13.24(1.00)	32.96(1.00)	44.81(1.00)	47.73(1.00)
AR(1)	-2.95(0.00)	-1.51(0.13)	-2.34(0.19)	-2.86(0.00)	-4.15(0.00)
AR(2)	0.88(0.38)	-1.88(0.06)	0.66(0.51)	0.90(0.37)	-1.10(0.27)

Standard errors in parentheses

For Sargan Test, AR(1) and AR(2), values in parenthesis denote probabilities at 5 %

+ significant at 10%; \* significant at 5%; \*\* significant at 1%

The coefficient of real exchange rate variable is negative and significant for full sample and all sub-samples except industrialized countries. This is consistent with the

predictions of the Mundell-Fleming model. If the Marshall Lerner conditions hold, a rise in real exchange rate which means the depreciation of real exchange rate results in smaller current account deficits by leading to the increase of exports and decline of imports. In line with this argument, Calderon et al. (2002) find a negative relationship between the real exchange rate and the current account deficit. Similarly, Debelle and Faruquee (1996) report a negative correlation between the real exchange rate and the current account deficit. On the other hand, according to the intertemporal approach, the impact of the real exchange rate on the current account deficit is ambiguous (Calderon et al., 2002).

There are contrasting views on the role of capital controls in the dynamics of current account. On the one hand, countries that impose controls on capital flows would run smaller current account imbalances. On the other hand, in some cases, countries that experience large current account imbalances introduce capital controls in order to diminish the repercussions of huge external imbalances. In the former case, capital controls are associated with smaller current account deficits while the latter implies the co-existence of capital controls and current account imbalances. The coefficient of the capital control variable is negative and significant only for the developing countries excluding the least developed ones. The sign of the coefficient is consistent with the theory as capital controls cause smaller current account imbalances. For most of the regressions, the relationship between capital controls and the current account deficit is insignificant. This contradicts with the view that capital controls play a major role in current account determination. The previous empirical studies report that the coefficient of the capital controls variable is not statistically significant<sup>10</sup>. Calderon et al. (2002) use the black market premium and the balance of payments controls and find no significant relationship between these variables and the current account deficit. Similarly, according to Chinn and Prasad (2003), the coefficient of the capital controls variable is insignificant for all sub-samples.

The income variable is defined as the log of GDP at purchasing power parity. We find a positive and significant relationship between the growth rate of GDP and the current account deficit for full sample and all sub-samples except for industrialized

---

<sup>10</sup> See Chinn and Prasad (2003), Debelle and Faruquee (1996) and Calderon et al. (2002).

countries, and the impact of the former on the latter is economically high. The magnitude of the coefficient is high as a unit increase in log of GDP implies more than doubling of GDP. This is consistent with the theoretical explanations as higher GDP growth together with higher investment is associated with widening current account deficits. As far as the equity home bias considered, we can conclude that, domestic saving is retained to finance domestic investment in relatively larger economies and, moreover, these countries attract foreign funds as well. Hence, foreign funds will also be biased towards the larger economies with efficient financial markets and diversified menu of assets. Chinn and Prasad (2003) find a positive relationship between average GDP growth and the current account deficit although this relationship is not statistically significant. Calderon et al. (2002) also reports a positive relationship between the domestic output growth and the current account deficit.

We find a positive and significant relationship between financial deepening variable and the current account deficit for full sample all sub-samples. Financial deepening variable represents the depth and the sophistication of a financial system. On the one hand, a more sophisticated financial system may induce a higher amount of national saving and thus the current account deficit declines with the increasing level of financial deepening. On the other hand, the financial deepening variable can be interpreted as a measure of borrowing constraints that a country faces. The consumption smoothing behaviour of economic agents depends on their ability to borrow. Therefore, borrowing constraints tend to play an important role in intertemporal saving and consumption decisions of agents. If there are borrowing constraints, households will not be able to increase the present consumption even if they prefer to do and national savings increase as, in such a case, it would be more costly for households to smooth consumption over time. The stringency of borrowing constraints declines with the financial deepening of an economy. In such a case, national savings decrease with the improvement of the latter. Thus, a relatively more sophisticated financial system may be associated with a widening of the current account deficit. Chinn and Prasad (2003) report a negative and significant relationship between financial deepening and the current account deficit.

The coefficient of the openness variable is negative and significant –for the full sample and all sub-samples except for developing countries including least developed countries- indicating that the relatively open economies experience lower current account deficits. According to Calderon et al. (2002), the expected sign of the coefficient of the openness variable is ambiguous. On the one hand, exposure to foreign trade can make countries relatively more vulnerable to external shocks. Moreover, for the countries which have a large export base, openness leads to an increase in exports and rises the ability to service external debt. Chinn and Prasad (2003) report a negative relationship between openness and the current account balance (i.e. a positive relationship between openness and the current account deficit). However, this relationship is significant only for developing countries.

#### **5.4. Estimation Results with Additional Variables**

We introduce additional explanatory variables into our model. We do not incorporate these additional variables into our original model because introducing these variables lead to the loss of observations. These variables are budget balance, domestic inflation rate and government expenditure. We also introduce relative income variable defined as the income of a country relative to that of USA. This variable is a proxy for country size. Sargan test does not reject the validity of instruments. On the other hand, the diagnostics show that there is no second order auto-correlation in all models. Table 5.4 shows the estimation results with additional variables. In the first regression, we include budget balance and find out that the coefficient of the budget balance variable is negative and significant implying that smaller budget deficits lead to decreasing current account deficits. This supports the twin deficit view that budget deficits coexist with current account imbalances. On the other hand, when we introduce the inflation rate as a determinant of the current account deficit, we observe that this variable is positively and significantly related to the current account deficit although the size of the coefficient is extremely small. In other words, an increase in the domestic inflation rate results in higher current account deficits. Following an increase in the domestic inflation, imports increase while exports decrease as foreign goods become relatively cheaper. Finally, the coefficient of the government expenditure variable is positive and significant implying

that higher government expenditure is associated with widening current account imbalances.

**Table 5.4: Estimation Results with Additional Variables**

	[1]	[2]	[3]	[4]
Constant	-0.969**	-0.900**	-0.851**	-0.256**
	0.045	0.039	0.041	0.017
Lagged CAD	0.357**	0.322**	0.306**	0.347**
	0.007	0.005	0.005	0.006
Governance	0.066**	0.074**	0.088**	0.126**
	0.004	0.007	0.006	0.005
ERregime	-0.058**	-0.079**	-0.062**	-0.055**
	0.014	0.014	0.012	0.010
TOT	-0.095**	-0.101**	-0.095**	-0.084**
	0.002	0.002	0.002	0.003
RER	-0.456**	-0.372**	-0.425**	-0.149
	0.095	0.103	0.103	0.112
Capcontrols	0.425	-0.161	0.336+	1.148**
	0.318	0.395	0.19	0.357
GDP	24.291**	20.273**	19.195**	
	1.111	1.098	1.184	
Findeepening	0.032**	0.029**	0.024**	0.023**
	0.004	0.004	0.003	0.004
Openness	-0.023**	-0.011**	-0.011**	0.005
	0.005	0.003	0.003	0.003
Budget Balance	-0.020**			
	0.007			
Inflation		0.000**		
		0.000		
Gov. Exp.			0.263**	
			0.013	
Size				0.227
				0.299
Observations	853	1051	1053	1053
No. of countries	70	76	76	76
Sargan Test	66.75(1.00)	67.14(1.00)	64.26(1.00)	68.03(1.00)
AR(1)	-2.27(0.02)	-2.97(0.00)	-2.93(0.00)	-2.98(0.00)
AR(2)	0.97(0.33)	0.89(0.37)	0.88(0.38)	0.65(0.51)

Standard Errors in parenthesis

For Sargan test, AR(1) and AR(2), values in parenthesis denote probabilities

+ significant at 10%; \* significant at 5%; \*\* significant at 1%

Higher country size leads to a richer menu of assets and investors are inclined to invest in project in their home country, a phenomenon which is called as the equity home bias. Due to the equity home bias, domestic savings are retained in the home country leading to a strong saving investment link. Thus, according to the equity home bias, the saving investment link tends to be stronger in relatively larger countries. Several empirical studies examined to validity of the equity home bias. For example, Martin and Rey (2004) show that, in imperfectly competitive asset markets, the ownership of equity will be biased towards domestic nationals. Strong and Xu (2003) depart from institutional explanations and depend on behavioural explanations asserting that, the fund managers have relative optimism towards their home financial markets. Ahearne et al. (2004) state that, as an indirect barrier to international investment, information costs is an important factor behind the equity home bias phenomenon. On the other hand, Lewis (1999) examines the several explanations to the equity home bias and finds out that neither of them is convincing. The equity home bias implies a negative relationship between country size and the current account deficit in the sense that, the larger the country is, the smaller will be the current account imbalances as domestic savings will finance the domestic investment. On the other hand, the financial markets are likely to be more efficient in larger countries leading to a higher bias towards domestic equities. We estimate our model including country size variable instead of the growth rate of GDP. However, as can be seen in Table 5.4, we do not observe a significant association between country size and the current account deficit.

## CHAPTER 6

### THE FELDSTEIN HORIOKA PUZZLE REVISITED

#### 6.1. Introduction

Over the last decades, the international financial system has been characterized by unfettered capital mobility among nations. Globalization of financial markets and increasing financial integration released international capital flows from any kind of controls and impediments. On the one hand, abolishing the capital controls and barriers to free flow of funds set the scene for increasing international capital mobility. On the other hand, the technological advances in financial sector and innovations in information and transaction technologies contributed to the free flow of capital. Elimination of capital controls and implementation of relatively flexible exchange rate regimes paved the way for international capital to globally seek the highest return and exploit profit opportunities all over the world. In such an environment, small differences in the rate of return to capital triggered large inflows of capital which, at the same time, are subject to sudden stops due to the removal of differences in the rate of return.

In a completely closed economy, investment is financed solely by national saving. Hence, there should be a one to one correlation between domestic investment and national saving. However, exposure to foreign trade lets countries depend on foreign capital as a means of financing domestic investment. The strong correlation between domestic investment and national saving is supposed to be broken as international capital mobility relaxes financing constraints on investment. Feldstein and Horioka (1980), in their seminal paper, analyzed the long run saving investment correlation for a group of OECD countries for the period 1960-1974. They, reporting a saving retention coefficient of 0.89, concluded that there is a high correlation between national saving

and domestic investment. The high saving investment correlation interpreted as evidence of low capital mobility has been at the centre of ongoing debate over the last two decades and proposed as one of the major puzzles in international macroeconomics (Obstfeld and Rogoff, 2000). Empirical studies continued to report high correlation between domestic investment and national saving and none of the explanations seemed to be sufficiently convincing. Yet, the saving investment correlation coefficient remained considerably high although it somewhat declined over the last years. Theoretically, the link between saving and investment is expected to weaken as a result of increasing international capital mobility. However, this weakening of saving investment correlation can not be confirmed on empirical grounds. Thus, the strong correlation between national saving and domestic investment rates remained to be a controversial issue.

In this chapter, we analyze the saving investment correlation both in the long term and in the short term for a broad sample of industrialized and developing countries. Section II provides a brief survey of literature developed on the Feldstein-Horioka puzzle. The following section proceeds with a descriptive analysis of the saving, investment and current account data. In section IV, we report estimation results and finally, section V concludes.

## **6.2. Literature Survey**

The debate over the link between the saving investment correlation and international capital mobility started with the influential paper written by Feldstein and Horioka (1980). The strong saving investment correlation which persists even under increasing capital mobility is later called as the Feldstein Horioka puzzle. Under perfect capital mobility, there has to be no relationship between national saving and domestic investment because, capital moves to where it has the highest rate of return in order to reap the highest profit opportunities. Hence, savings do not have to be retained within the domestic economy, producing a low level of saving retention coefficient. Therefore, in a world of relatively high capital mobility, the saving investment correlation is to be close to zero. Feldstein and Horioka (1980) report a saving retention coefficient of 0.89 which is considerably high. Feldstein and Bacchetta (1989) extend the earlier study of

Feldstein and Horioka by including the post 1980 period. They find out that the saving retention coefficient is still high although it is somewhat smaller for the post 1980 period compared to the previous periods. Following these pioneering works, a broad literature that aims to explain the high correlation between national savings and domestic investment evolved<sup>11</sup>.

Research developed on the Feldstein Horioka puzzle followed two directions. Some studies check whether the Feldstein Horioka findings hold for different samples and periods or with different estimation techniques<sup>12</sup>. A broader part of the literature aimed to reconcile the strong saving investment correlation with high capital mobility. This strand of literature examines whether the saving retention coefficient is a robust indicator of international capital mobility. Most of the studies on this issue question whether the saving investment correlation reflects the degree of capital mobility<sup>13</sup>. According to Levy (2003), the strong long run saving-investment correlation is not informative for evaluating the international capital mobility. On the other hand, several studies developed a general equilibrium model which incorporates the determination of saving and investment under the assumption of perfect capital mobility. For example, Baxter and Crucini (1993) conclude that the strong saving investment correlation naturally arises within a two country one good general equilibrium model which assumes perfect capital mobility. However, these models are subject to criticism as well: on the one hand, they are not supported on empirical grounds and, on the other hand, they depend on simplifying assumptions which rule out the complexities of international trade and financial transactions. Nonetheless, these models account for the business cycle effects and are quite affirmative in explaining the effects of common shocks that have impact of both saving and investment<sup>14</sup>.

There are several explanations proposed by the literature for the Feldstein Horioka puzzle, including the simultaneity bias resulting from the endogeneity of

---

<sup>11</sup> For an extensive survey of literature, see Tesar (1991), Frankel (1992) and Coakley et al. (1998).

<sup>12</sup> Coakley et al. (2004) apply both cross section regressions and mean group estimation which accounts for country heterogeneity and conclude that the coefficients of the latter is considerably low compared to the former.

<sup>13</sup> For example, Sachsida and Caetano (2000) and Coakley *et al.* (2004) proposed that the saving investment correlation does not reflect the degree of capital mobility, instead shows the substitution between domestic and foreign savings.

<sup>14</sup> Giannone and Lenza (2004) claim that the general equilibrium effects can partly explain the high saving investment correlation for OECD countries.

national savings, sample selection, common contemporaneous shocks, omitted relevant variables, endogenous government policy actions which aims to reduce current account imbalances, the equity home bias or the country size, presence of non-traded goods, transaction costs for traded goods and current account solvency.

Some studies stressed the endogeneity of national saving in the sense that there are some common factors that play a role in the determination of both saving and investment. In other words, there are some joint determinants of saving and investment other than interest rate like growth rate or common contemporaneous shocks. For example, Obstfeld (1986) argue that common impact of growth rates may be the underlying factor behind the high saving investment correlation. Levy (2003) argues that, incorporating an omitted variable, output, into the system, one can explain the Feldstein-Horioka puzzle. In this case, saving and investment become cointegrated and exhibit a strong co-movement regardless of the degree of capital mobility. On the other hand, Feldstein and Bacchetta (1989) provide no support for the view that an omitted economic growth variable does have impact on the high saving investment correlation. Kim (2001) claims that the high saving investment correlation is invariant to cyclical shocks.

However, Feldstein Horioka regressions, depending on long term averages of saving and investment data, rule out these business cycle effects which lead to the endogeneity of savings and avoid the simultaneity bias. On the other hand, some researchers advocate the use of annual observations on the grounds that depending on long term saving investment data creates bias against capital mobility (Krol, 1996 and Sinn, 1992). As the intertemporal budget constraint does not allow for unlimited foreign borrowing; thus, the level of national saving can not deviate from that of domestic investment in the long run. Krol (1996), depending on a panel data set using annual observations, reports a high degree of capital mobility.

Coiteux and Oliver (2000) criticize Krol's findings as being considerably responsive to sample selection. According to them, inclusion of Luxembourg leads to the low saving investment correlation in Krol's regressions. By excluding Luxembourg from the sample, they find out a high degree of capital mobility in the short run while they agree with Feldstein and Horioka's results of high saving investment correlation in

the long run. Several other studies blamed the inclusion of Luxembourg for the low estimate of saving investment correlation<sup>15</sup>.

Frankel (1992) decomposes the real interest rate differential into the country premium and currency premium and concludes that, even if there is no country premium, i.e. interest rates contracted in common currency are equalized across countries, there is still a significant degree of currency premium which makes interest rate differentials different from zero. The view that the Feldstein Horioka finding may depend on the currency premium motivated some researchers to control the intra-national validity of the Feldstein Horioka finding. For example, Sinn (1992) examines the intra-national saving investment relationship and finds no evidence in favor of strong correlation between saving and investment.

The Feldstein Horioka puzzle is closely linked to another puzzle in international economics (Obstfeld and Rogoff, 2000), namely the equity home bias puzzle. Investors tend to invest funds domestically rather than diversifying them internationally, leading to a high saving investment correlation<sup>16</sup>. The equity home bias puzzle is especially valid for relatively larger economies in the sense that country size has a determining role in the equity home bias puzzle. In line with this argument, country size, leading to the retention of national saving within domestic boundaries, has strong implications regarding the high correlation between domestic investment and national saving rates. Baxter and Crucini (1993) find out that the relationship between saving and investment is stronger in relatively larger countries. Accordingly, Ho (2002) reports that the saving retention coefficient is higher for countries with relatively higher GNP shares

Empirical studies also show that the relatively low estimates of saving investment correlation within European Union (EU) can be attributed to increasing economic and financial integration<sup>17</sup>. Blanchard and Giavazzi (2002) estimate that the Feldstein Horioka regression coefficient is 0.57 for the sample of OECD countries for the post 1990 period while it takes the values 0.36 and 0.14 for the EU and the Euro area respectively. They conclude that, in highly integrated regions, investment and saving

---

<sup>15</sup> Some other studies checked the sample sensitivity of saving investment correlation. See Jansen (2000), Ho (2002).

<sup>16</sup> For a broad discussion on equity home bias puzzle, see Lewis (1999), Ahearne et al. (2004), Obstfeld and Rogoff (2000) and Tesar (1991).

<sup>17</sup> See Feldstein and Bacchetta (1989)

appear to be increasingly uncorrelated. In the same manner, Hericourt and Maurel (2005) analyze the saving investment association throughout European Union at the regional level and find out that political, geographic and economic integration leads to weakening correlation between saving and investment.

Artis and Bayoumi (1990) point to the role of endogenous government policy actions targeting to reduce the current account imbalances. In line with this argument, Schmidt (2001) examines the endogeneity of saving and investment which emphasizes the equilibrating role of the latter in response to the government policies implemented in order to promote the former. Wong (1990) argued that the existence of nontraded goods can independently lead to a saving investment correlation. On the other hand, Obstfeld and Rogoff (2000) stress the role of transaction costs in explaining the Feldstein Horioka puzzle. However, Buckley (2002) claims that, the existence of such trading costs does not help solving the Feldstein Horioka puzzle.

Another explanation for the strong saving investment correlation is the long run intertemporal budget constraint or the current account solvency. Coakley et al. (1996) reveal that it is misleading to interpret the strong saving investment correlation as an indicator of low capital mobility since the current account solvency imposes that the long run saving investment rates cointegrate with a unit coefficient. It is this unit coefficient that is captured by long run saving investment correlation irrespective of the degree of capital mobility. In the same manner, some studies show that the high correlation between saving and investment rates owes more to the intertemporal budget constraint than to the low degree of capital mobility<sup>18</sup>.

Several studies examine saving investment correlation in various aspects. For example, Cadoret (2001) differentiates between public and private saving and concludes that the correlation of investment with the former is quite high where the latter seems to be uncorrelated with national investment rate. On the other hand, Ozmen and Parmaksız (2003a, 2003b) analyze the impact of an endogenous structural break corresponding to a major policy regime change on the saving investment relationship. Sinha (2002) examines the saving investment correlation for Japan and other Asian countries taking

---

<sup>18</sup> See Jansen (1997, 2000)

structural breaks into account. Rossini and Zanghieri (2003) find out that the exclusion of foreign direct investment leads to the weakening of saving investment correlation.

### 6.3. Descriptive Analysis

In this section, we provide a descriptive analysis of saving, investment and their relationship with the current account balance for a sample of 75 countries including both industrial and developing ones. The period covers the years between 1984 and 2001. Table 6.1 shows the simple correlation coefficients of saving investment and the current account data. As can be seen from the table, the correlation between the current account balance and investment is negative as the theory predicts, although being considerably low. The correlation between saving and the current account balance is positive and significantly high compared to the correlation between the latter and investment. On the other hand, saving investment correlation is 0.74, which is a notably high value.

**Table 6.1: Simple Correlation Coefficients**

	CAB	I	S
CAB	1		
I	-0.0367	1	
S	0.5265	0.7352	1

**Table 6.2: Summary Statistics**

Variable		Mean	Std. Dev.	Min	Max	Observations
CAB	overall	-2.06	4.87	-31.07	31.98	N =1296
	between		3.19	-10.05	8.56	n =75
	within		3.72	-31.33	21.36	T-bar =17.28
I	overall	21.28	6.09	1.04	46.36	N =1347
	between		4.90	10.15	37.65	n =75
	within		3.66	5.97	38.48	T-bar =17.96
S	overall	18.85	7.69	-9.59	48.38	N =1279
	between		6.79	2.12	39.52	n =75
	within		3.98	2.10	35.82	T-bar =17.05

Table 6.2 shows the summary statistics of saving investment and the current account data. We can also observe the decomposition of variances into cross section and time series components. If we look at the standard deviation of the current account balance seems to be almost equal for within and between country data. However, the standard deviation of investment data is higher as far as the cross section component is considered. The between country standard deviation of the saving data is even much higher than the within country standard deviation. Hence, we observe that the cross sectional variation of saving and investment is considerably higher compared to the time series variation within each country.

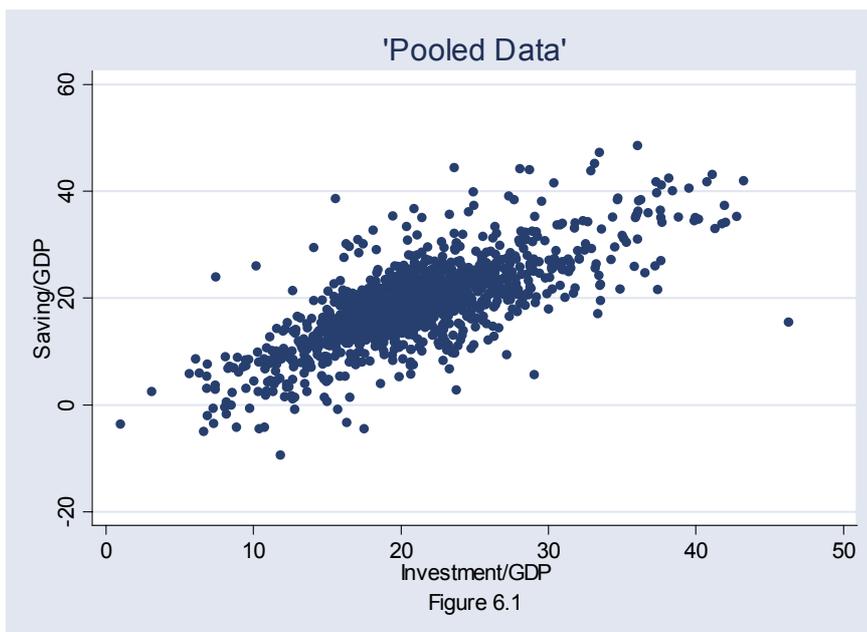
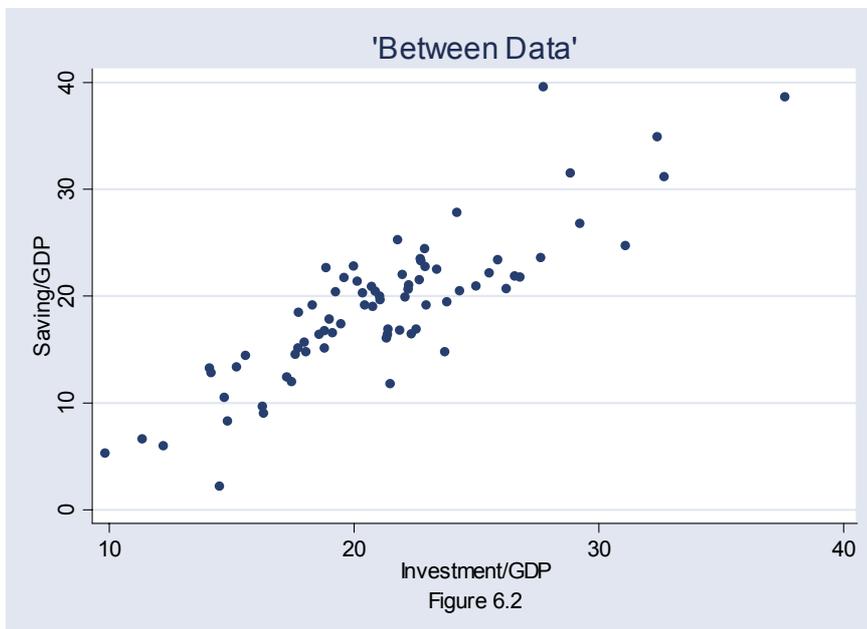


Figure 6.1 shows the association between saving and investment rates for the pooled data. Again, we observe that saving and investment exhibit a strong correlation. On the other hand, Figure 6.2 shows the relationship between the period averages of saving and investment for a cross section of countries. Korea, Thailand, Japan and China

are located at the northeast part of the figure; that is, both saving and investment rates of these countries are approximately higher than or equal to 30 %. On the other hand, Cote D'Ivoire, Madagascar, Niger and Zambia have saving rates less than 10 % and investment rates less than 15 %. These countries except Cote D'Ivoire are among the least developed countries according to the UN country classification. The relationship between saving and investment for the within data again shows a fairly close association (Figure 6.3).



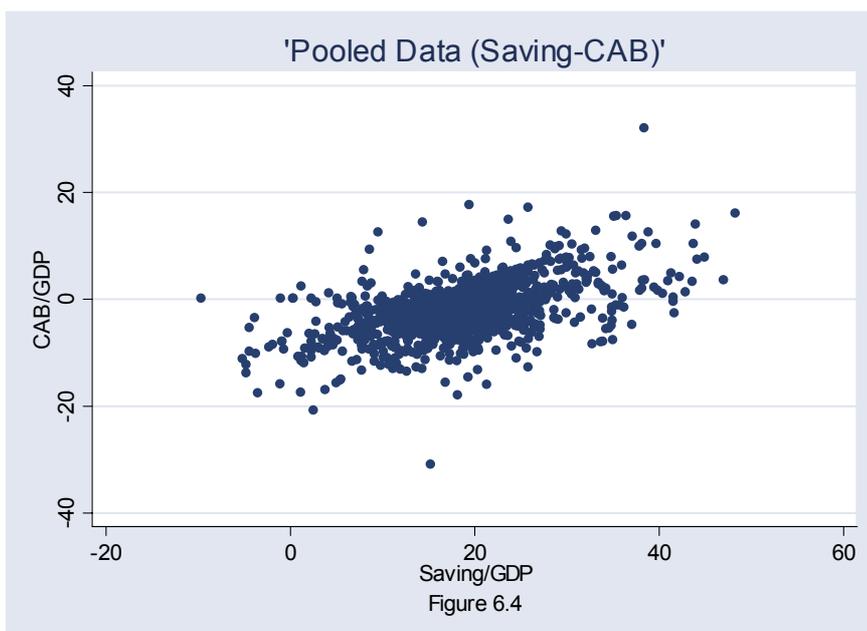
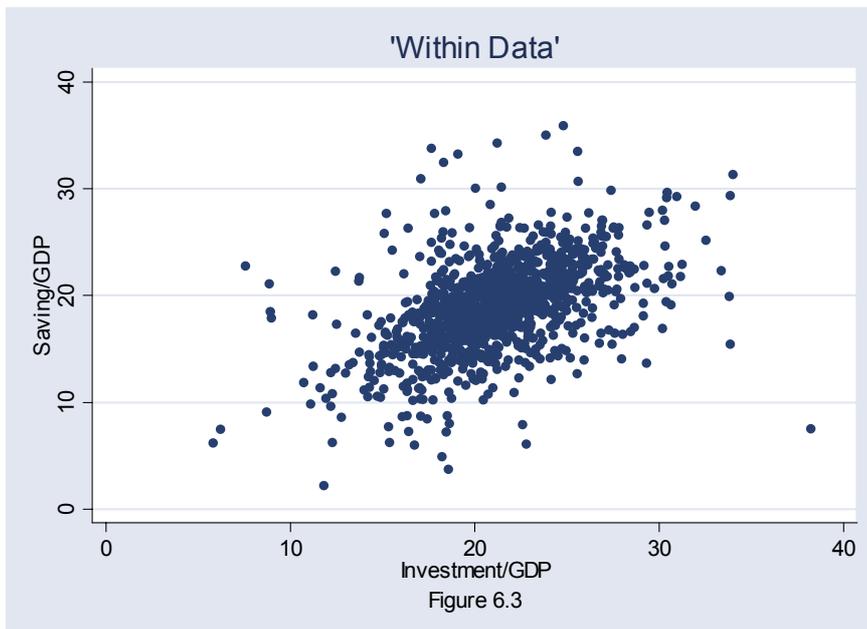
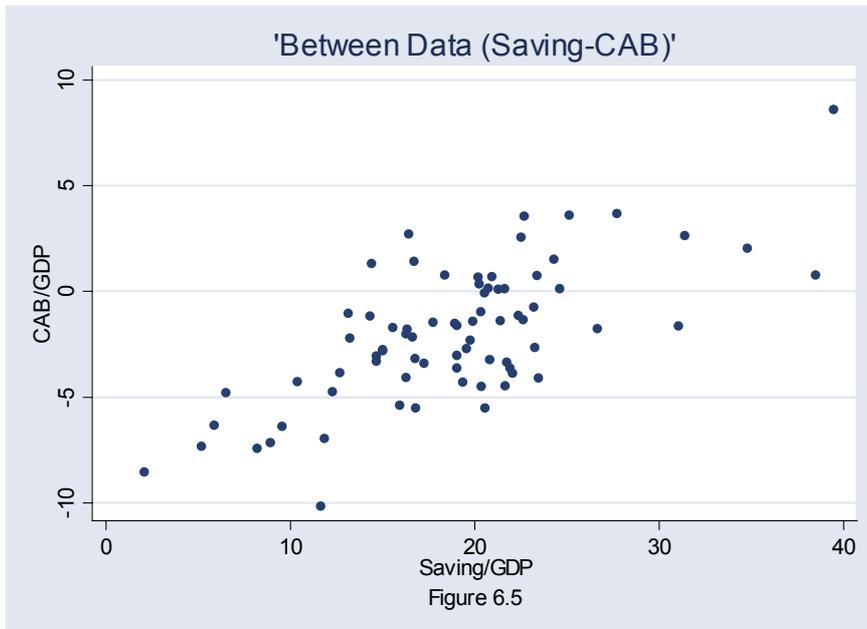


Figure 6.4 shows the relationship between saving and the current account balance for the pooled data. We observe a close correlation between these variables implying that higher current account balances are associated with higher saving rates.

Figure 6.5 indicates that the positive relationship between saving and the current account balance is observable when we examine the between country correlation.

Figure 6.5 also shows that countries that have significantly high saving rates, in general, run positive current account balances. For example, saving rates of Korea, Japan and China exceed 30 % and these countries experience current account surpluses on average. On the other hand, the within country correlation between saving and the current account balance shows a positive relationship between these variables (Figure 6.6).



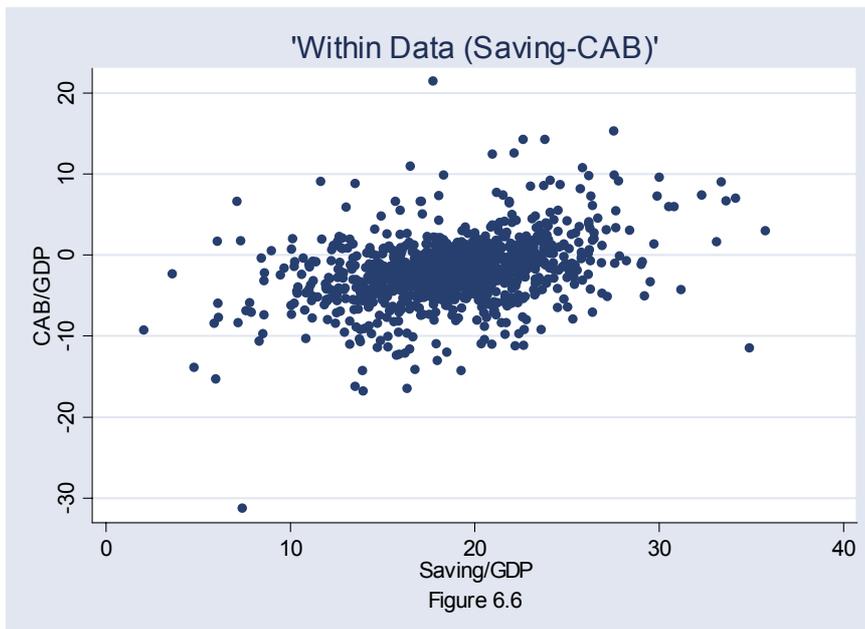
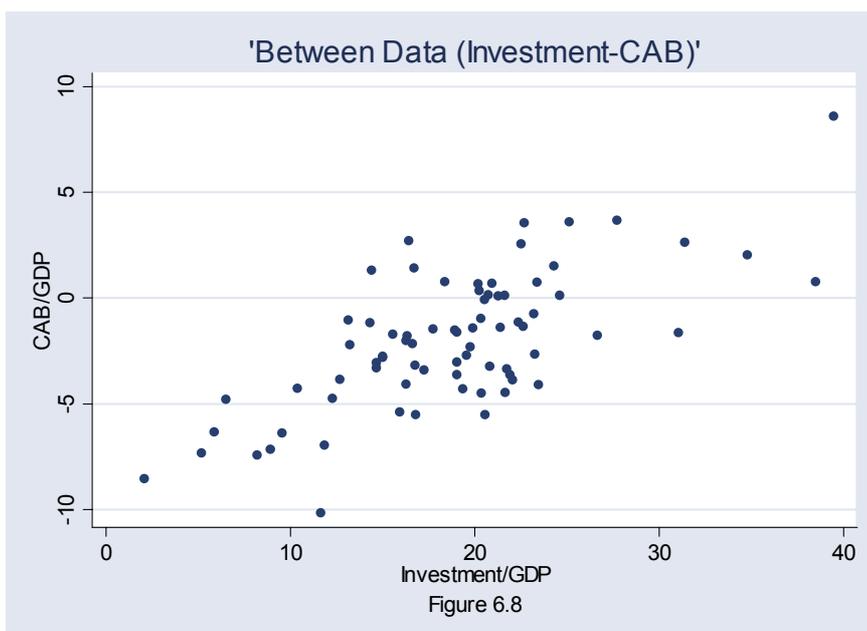
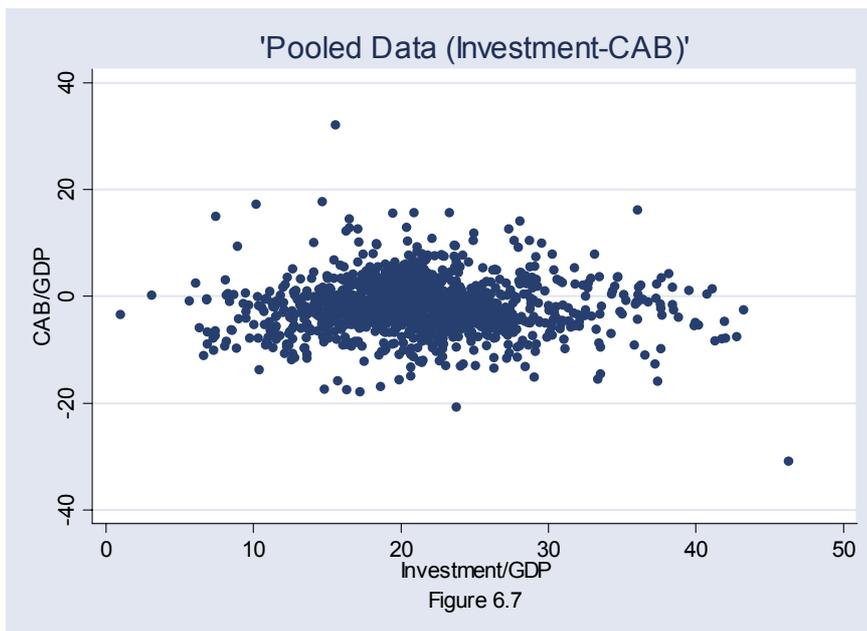
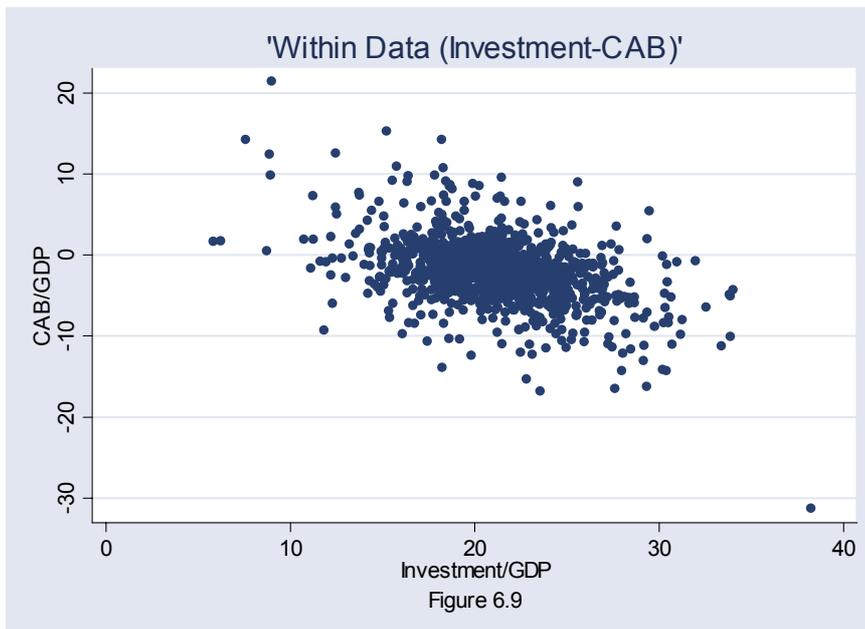


Figure 6.7 shows the relationship between investment and the current account balance for the pooled data. We do not observe an exact relationship; the current account balance does not seem to be negatively associated with investment rate as the theory predicts. On the contrary, the between data displays that investment and the current account balance are positively related to each other (Figure 6.8). On the one hand, countries that have considerably high investment rates like Korea, Japan and China are, at the same time the ones with current account surpluses. On the other hand, the least developed countries like Niger, Madagascar and Zambia and most of the Sub-Saharan countries have very low investment rates and huge current account deficits. In contrast to the between data, the within data shows a negative association between investment and the current account balance (Figure 6.9). This implies that, within countries, increases in investment are associated with widening current account imbalances. However, countries that have considerably high investment rates are those with positive current account balances. Hence, contrary to the Sachs's argument (Sachs, 1981), widening current account deficits do not reflect shifts in investment opportunities. Countries that run significantly large current account deficits, in general, have very low

investment rates. On the other hand, extensively large amounts of investment in countries like Korea and China are financed by domestic savings instead of foreign savings as evidenced by the positive average current account positions and significantly high saving rates of these countries.





The between data reflects the dynamic nature of the relationship between investment and the current account balance. Contrary to the within data, it shows the long term association between these variables. However, the within data displays the short run changes in investment and the current account balance. In other words, for a given country, an annual increase in investment might be accompanied by widening of the current account deficit. This might be due to the deficiency of domestic savings or the intermediate goods import dependence of the country. In any case, the within variation is static in nature because it overlooks the impact of increasing investment on the level of saving and the current account balance. However, increasing investment, in the long term, leads to the expansion of capital stock, higher productivity, diversification of export base and release from dependence on intermediate goods. Countries with high investment rates generally have positive current account positions; these countries are not squeezed by domestic financing constraints. Therefore, the between data shows a positive association between investment and the current account balance.

The simple correlation coefficients show that the saving investment correlation is considerably high. On the other hand, the correlation between investment and the current

account balance is quite low whereas the correlation between saving and the current account is relatively high. These simple correlation coefficients imply that higher investment is associated with increased saving without any significant change in the current account balance. On the other hand, higher saving is associated with relatively higher current account balances.

#### 6.4. Empirical Results

Feldstein and Horioka (1981) run cross section regression of investment on saving for 16 OECD countries for the period 1960-1974. The Feldstein Horioka regression is specified as follows, where  $I_i$  is national investment as a share of GDP and  $S_i$  is national saving as a share of GDP.

$$I_i = \alpha + \beta S_i + u_i$$

In this section, we first check the correlation between the current account balance and investment. We run the following regression for a cross section of 75 countries for the period 1984-2001. CAB is defined as the current account balance as % of GDP and I is defined as the gross capital formation as % of GDP.

$$CAB_{it} = \alpha + \beta I_{it} + u_{it}$$

In neoclassical theory, investment depends on the marginal product of capital. On the other hand, changes in the saving rates rest on a broad set of factors including institutional and legal framework, demographics, income growth, tax and social security structure and financial structure of the economy. Hence, factors underlying the saving behavior in an economy are completely different from the determinants of investment. For example, a positive income shock leads to an increase in savings without having any impact on investment. On the other hand, a rise in productivity results in higher investment although it does not affect the amount of savings. Thus, theory does not predict a close correlation between saving and investment; however, the latter is supposed to be related to the current account balance with a coefficient close to -1. In other words, since the increase in saving has no effect on investment, it should lead to a one-to-one increase in the current account (Ventura, 2002). In the same manner, since change in investment does not theoretically have impact on saving,  $\beta$  is supposed to be close to -1. Table 6.3 shows the estimation results for the pooled, within and between

regressions. The coefficient of investment rate is approximately -0.37 indicating a relatively weak association between investment and the current account balance. The regression coefficient is higher in case of the within regression, at around -0.45. Between estimation results confirm the positive relationship between investment and the current account implying that countries that have high investment rates, at the same time, run current account surpluses. Ventura (2002) reports smaller coefficients (-0.19 for the pooled regression, -0.33 for the within regression and -0.03 for the between regression).

**Table 6.3: Investment and Current Account Balance**

	Pooled Regression	Within Regression	Between Regression
I	-0.367**	-0.452**	0.225**
	0.026	0.027	0.07
Constant	5.770**	7.572**	-6.829**
	0.652	0.574	1.53
Observations	1294	1294	1294
No. of code	75	75	75
R <sup>2</sup>	0.001	0.192	0.124

Standard errors in parentheses

\* significant at 5%; \*\* significant at 1%

Wald chi2(1) = 205.78 Prob> chi<sup>2</sup> = 0.000

Table 6.4 shows the relationship between investment and the current account balance for industrialized and developing countries separately. We observe that the coefficient of the investment rate is higher for industrialized countries compared to the developing country sub-sample. The within country regression coefficients are higher than the pooled regressions for both sub-samples. On the other hand, the between country regression coefficients are positive for both industrialized and developing country sub-samples, although the size of the coefficient is higher for the latter.

**Table 6.4: Investment and Current Account Balance for Sub-Samples**

	Industrialized Countries			Developing Countries		
	Pooled	Within	Between	Pooled	Within	Between
I	-0.546**	-0.592**	0.095	-0.333**	-0.429**	0.215**
	0.046	0.047	0.173	0.03	0.032	0.076
Constant	11.825**	12.882**	-2.587	4.255**	6.198**	-7.142**
	1.195	1.056	3.936	0.756	0.673	1.629
Observations	376	376	376	918	918	918
No. of code	21	21	21	54	54	54
R <sup>2</sup>	0.027	0.313	0.016	0.001	0.174	0.134

Standard errors in parentheses

\* significant at 5%; \*\* significant at 1%

**Table 6.5: Saving and Current Account Balance**

	Pooled Regression	Within Regression	Between Regression
S	0.340**	0.343**	0.331**
	0.021	0.025	0.039
Constant	-8.478**	-8.553**	-8.302**
	0.481	0.485	0.79
Observations	1277	1277	1277
No. of code	75	75	75
R <sup>2</sup>	0.277	0.134	0.491

\* significant at 5%; \*\* significant at 1%

Wald  $\chi^2(1) = 256.17$  Prob >  $\chi^2 = 0.000$

In order to see the relationship between saving and the current account balance, we run the following regression for the same panel data set of 75 countries covering the period 1984-2001. S is defined as the gross national savings as % of GDP.

$$CAB_{it} = \alpha + \beta S_{it} + u_{it}$$

Table 6.5 shows that, national saving is positively related to the current account balance and the size of the correlation coefficient is at around 0.34. Contrary to the investment-current account balance relationship, results do not change for between and within regressions. On the other hand, separate regressions for industrialized and developing country sub-samples show that, the correlation between saving and the

current account balance is higher for the sub-sample of industrialized countries compared to that of developing countries. Ventura (2002) estimates the correlation coefficient as 0.21 for the pooled regression, 0.20 for the within regression and 0.22 for between regression.

**Table 6.6: Saving and Current Account for Sub-Samples**

	Industrialized Countries			Developing Countries		
	Pooled	Within	Between	Pooled	Within	Between
S	0.445** (0.048)	0.465** (0.054)	0.356** (0.107)	0.322** (0.025)	0.329** (0.029)	0.308** (0.045)
Constant	-10.325** (1.172)	-10.670** (1.184)	-8.362** (2.428)	-8.365** (0.537)	-8.518** (0.531)	-8.098** (0.861)
Observations	365	365	365	912	912	912
No. of code	21	21	21	54	54	54
R <sup>2</sup>	0.277	0.179	0.369	0.249	0.129	0.469

Standard errors in parentheses

+ significant at 10%; \* significant at 5%; \*\* significant at 1%

**Table 6.7: Saving-Investment Correlation**

	Pooled Regression	Within Regression	Between Regression
S	0.479** (0.02)	0.439** (0.023)	0.631** (0.044)
Constant	12.175** (0.484)	12.905** (0.438)	9.312** (0.876)
Observations	1279	1279	1279
Number of code	75	75	75
R-squared	0.541	0.237	0.742

Standard errors in parentheses

\* significant at 5%; \*\* significant at 1%

Wald chi2(1) = 558.40 Prob> chi<sup>2</sup> = 0.000

We run the well known Feldstein-Horioka regression of the panel data set of 75 countries for the period 1984-2001.

$$I_{it} = \alpha + \beta S_{it} + u_{it}$$

**Table 6.8: Saving Investment Correlation for Sub-Samples**

	Industrialized Countries			Developing Countries		
	Pooled Regression	Within Regression	Between Regression	Pooled Regression	Within Regression	Between Regression
S	0.494** (0.044)	0.455** (0.05)	0.642** (0.094)	0.482** (0.024)	0.437** (0.026)	0.662** (0.052)
Constant	11.462** (1.074)	12.206** (1.105)	8.186** (2.132)	12.277** (0.557)	13.078** (0.478)	9.110** (0.99)
Obs.	365	365	365	914	914	914
No.ofcode	21	21	21	54	54	54
R <sup>2</sup>	0.445	0.194	0.711	0.557	0.243	0.756

Standard errors in parentheses

\* significant at 5%; \*\* significant at 1%

According to Table 6.7, estimation results show that the saving retention coefficient is 0.48; however, the regression coefficient is significantly higher for the between regression, at around 0.63. The relatively higher size of the between regression coefficient implies that countries with high saving rates, at the same time, have high investment rates. Countries can smooth consumption within periods depending on foreign savings when the domestic saving is deficient. The intertemporal consumption smoothing leads to the widening of the saving investment gap, namely the current account deficit. However, in the long run, no Ponzi game condition implies a close correlation between saving and investment rates. Table 6.8 shows the saving investment correlation for industrial and developing country sub-samples. We do not observe significant differences in the saving retention coefficients when we compare these groups of countries. For both sub-samples, the between regression coefficient is higher compared to the within regression coefficient.

Most of the studies estimate a lower saving investment coefficient for developing countries compared to that of OECD countries. For example, Dooley et al. (1987) relate this result to country size stating that the developing countries are in general small in size, having no effect on international interest rates. Coakley et al. (1999) show that the cross section saving investment regression coefficient is lower for LDCs compared to the OECD countries; however, they interpret this result as an indicator of different policy responses rather than a high degree of capital mobility.

**Table 6.9: Saving Investment Correlation (EU Countries)**

	Pooled Regression	Within Regression	Between Regression
S	0.424**	0.458**	0.236+
	0.051	0.056	0.123
Constant	12.033**	11.425**	16.214**
	1.245	1.231	2.806
Observations	259	259	259
No. of code	15	15	15
R <sup>2</sup>	0.236	0.217	0.221

Standard errors in parentheses

+ significant at 10%; \* significant at 5%; \*\* significant at 1%

In order to observe the impact of integration on saving investment correlation, we run the Feldstein Horioka regression for a sample of European Union countries. We omit the latest joining countries as their date of inclusion to the union is the year 2004. The estimation results for a sample of 15 European Union countries are reported in Table 6.9. As can be seen from the table, we do not observe a significant change in the saving retention coefficient for the pooled and the within regressions. However, the coefficient of the between regression displays a drastic decline in the saving investment correlation. This shows that economic and financial integration leads to a weaker association between national saving and domestic investment rates. In other words,

following the integration, increasing investment is financed through foreign saving in some countries of the union. This is especially the case for the relatively lower-income countries. For example, widening current account deficits accompanied the increasing investment in Portugal and Greece<sup>19</sup>. Following the integration, the poorer countries (these are generally the new comers), being the ones with relatively higher rate of return, experience increases in investment. On the other hand, higher growth prospects for the future that stem from the integration lead to lower amounts of saving. Hence, they experience widening current account imbalances (see Blanchard and Giavazzi, 2002).

**Table 6.10: Saving-Investment Relationship (Extended Model)**

	Pooled Regression	Within Regression	Between Regression
Saving	0.459** (0.022)	0.407** (0.025)	0.632** (0.052)
Governance	0.033* (0.014)	0.036* (0.015)	-0.074 (0.044)
ERR	-0.027 (0.038)	-0.034 (0.043)	0.033 (0.084)
CAPCONT	0.824+ (0.456)	0.496 (0.487)	1.805 (1.337)
FINDEEP	0.002 (0.004)	-0.005 (0.005)	0.019* (0.008)
Openness	0.026** (0.007)	0.037** (0.009)	0.025* (0.012)
Constant	8.400** (1.136)	9.281** (1.283)	9.985** (2.908)
Observations	1235	1235	1235
No. of code	75	75	75
R-squared	0.532	0.262	0.788

Standard errors in parentheses

+ significant at 10%; \* significant at 5%; \*\* significant at 1%

Wald  $\chi^2(6) = 610.10$  Prob >  $\chi^2 = 0.000$

<sup>19</sup> For an analysis of the current account imbalances of Portugal and Greece, see Blanchard and Giavazzi (2002).

**Table 6.11: Extended Model of Saving Investment Relationship for Different Sub-Samples**

	EU Countries		Industrialized Countries		Developing Countries	
	Fixed Effect	Random Effect	Fixed Effect	Random Effect	Fixed Effect	Random Effect
Saving	0.520** (0.068)	0.532** (0.062)	0.461** (0.056)	0.507** (0.045)	0.406** (0.029)	0.463** (0.025)
GOV	0.043 (0.048)	0.033 (0.044)	-0.005 (0.041)	-0.006 (0.037)	0.024 (0.018)	0.029+ (0.017)
ERR	-0.027 (0.068)	-0.033 (0.06)	-0.125+ (0.069)	-0.066 (0.059)	-0.056 (0.055)	-0.059 (0.047)
CAPCONT	1.775* (0.715)	1.804** (0.697)	2.139** (0.665)	2.038** (0.621)	-0.271 (0.624)	0.003 (0.589)
FINDEV	0.020* (0.008)	0.018** (0.007)	-0.006 (0.006)	-0.001 (0.005)	0.001 (0.008)	0.016* (0.007)
OPENNESS	-0.033+ (0.018)	-0.029** (0.011)	-0.018 (0.016)	-0.025* (0.01)	0.051** (0.011)	0.044** (0.009)
Constant	6.695 (4.172)	7.076+ (3.777)	14.745** (3.735)	13.239** (3.234)	10.020** (1.445)	8.139** (1.311)
Observations	222	222	352	352	883	883
No. of code	13	13	21	21	54	54
R <sup>2</sup>	0.296	0.444	0.231	0.5	0.28	0.597
Hausman test statistic	1.26		9.03		23.66	

Standard errors in parentheses

+ significant at 10%; \* significant at 5%; \*\* significant at 1%

We also regress investment on saving and other set of explanatory variables including, governance, exchange rate regime, capital controls, financial deepening and openness to foreign trade. Table 6.10 shows the estimation results. We observe that the coefficient of governance is positive and significant for both pooled and within estimation implying that better governance is associated with higher levels of investment. In the same manner, the relationship between openness and investment is positive and significant for pooled, within and between estimation. This may be due to the fact that higher levels of openness to foreign trade indicate the existence of a large export base which embodies ample opportunities for investors. However, the relationship between governance and investment is insignificant for the between country estimation. On the other hand, the coefficient of the exchange rate regime variable is

insignificant in all cases. The coefficient of the capital controls variable is positive and significant at 10 % level for the pooled regression. The financial deepening variable is positively and significantly related to investment only in case of the between regression. The depth and sophistication of the financial system eases the financing constraints of investors and thus leads to increasing investment.

Table 6.11 shows the fixed and random effect estimation results of the extended model of saving investment correlation for different sub-samples. For example, the coefficient of the governance variable is insignificant except the random effects estimation for the sub-sample of developing countries. On the other hand, exchange rate regime variable is negatively and significantly related to investment for the fixed effect estimation for industrialized countries. The coefficient of the capital controls variable is positive and significant for both EU and industrialized countries. The financial deepening variable is positively and significantly related to investment for EU and industrialized countries. It is positively and significantly correlated with investment for the random effects estimation for developing countries. On the other hand, we observe negative and significant relationship between investment and openness variable while the coefficient of the latter takes a positive sign for the developing countries although it is still significant. According to the Hausman test statistics, we do not reject the null hypothesis that there is no systematic difference between random and fixed effect estimators except for the developing countries sub-sample.

Table 6.12 shows the Arellano Bond estimation for the augmented model for different sub-samples including EU countries, developed countries, developing countries. We regress investment rate on a set of explanatory variables. According to the Sargan test, we do not reject the validity of instruments for full sample and all sub-samples. However, for developing countries sub-sample, we reject the null hypothesis of no second-order autocorrelation. Estimation results show that, lagged investment rate is significantly related to the investment for the full sample and all sub-samples. There is a significant positive correlation between investment and saving for the all sub-samples. For the whole sample, governance is positively and significantly related to the investment rate implying that lower levels of risk are associated with higher investment. We also find positive significant relation between the investment rate and governance

for all sub-samples except EU countries. On the other hand, there is a negative significant relation between the exchange rate regime flexibility and the investment rate which indicates that relatively more flexible exchange rate regimes are associated with lower investment rates. This implies that countries with more flexible exchange rate regimes are more vulnerable to exchange rate risk. For the whole sample and most of the sub-samples, the coefficient of the capital control variable is positive and significant. This shows that capital controls, by isolating economies from external shocks and sudden stops of capital inflows, lead to higher investment. The coefficient of the openness variable is positive and significant implying that openness to foreign trade results in increasing investment. On the other hand, the coefficient of financial deepening variable is insignificant for the full sample and all sub-samples.

**Table 6.12: Arellano Bond Estimation for Full Sample and Different Sub-Samples**

	<b>Full Sample</b>	<b>EU Countries</b>	<b>Developed Countries</b>	<b>Developing Countries</b>
Lagged I	0.499** (0.008)	0.459** (0.164)	0.578** (0.042)	0.495** (0.013)
S	0.311** (0.006)	0.484** (0.149)	0.207** (0.045)	0.311** (0.01)
GOV	0.106** (0.005)	-0.001 (0.073)	0.137** (0.025)	0.095** (0.01)
ERR	-0.055** (0.013)	0.086 (0.311)	-0.071 (0.057)	-0.042 (0.026)
CAPCONT	1.173** (0.204)	3.196 (2.411)	1.624** (0.59)	0.753 (0.718)
FINDEV	-0.002 (0.002)	0.009 (0.006)	-0.001 (0.005)	0.002 (0.003)
OPENNESS	0.072** (0.004)	0.009 (0.025)	0.027* (0.011)	0.071** (0.006)
Constant	-0.181** (0.01)	0.025 (0.107)	-0.141** (0.026)	-0.175** (0.019)
Observations	1083	193	308	775
No. of countries	75	13	21	54
Sargan Test	67.0(1.00)	10.7(1.00)	19.04(1.00)	47.89(1.00)
AR(1)	-3.44(0.00)	-1.71(0.09)	-2.28(0.02)	-3.29(0.00)
AR(2)	-.059(0.55)	-1.87(0.06)	-2.58(0.01)	-0.38(0.70)

Standard errors in parentheses

For Sargan test, AR(1) and AR(2), values in parenthesis denote probabilities at 5 %

+ significant at 10%; \* significant at 5%; \*\* significant at 1%

## 6.5. Long-Run Saving Investment Relationship

In this section, we analyze the long-run relationship between saving and investment. In this context, we first apply unit root tests for saving and investment series of each country in our data set. Table 6.13 shows the Augmented Dickey Fuller (ADF) test statistics for saving, investment and current account balances of 75 countries in the sample. The numbers in parentheses show the lag lengths. Estimation results show that most of series have a unit root<sup>20</sup> (\* indicates the rejection of the unit root at 5 % level).

**Table 6.13: Unit Root Tests for Individual Countries**

	Saving		Investment		Current Account	
	Level	First Difference	Level	First Difference	Level	First Difference
ARG	-3.305(0)*	-4.384(0)*	-2.685(1)	-4.019(1)*	-1.187(0)	-2.856(0)
AUS	-2.343(0)	-4.707(1)*	-2.978(1)	-5.081(1)*	-6.923(1)*	-5.747(2)*
BEL	-0.746(0)	-4.015(0)*	-2.205(1)	-4.323(0)*	-2.419(0)	-3.716(0)*
BFA	-1.037(0)	-3.748(1)*	-2.140(0)	-5.604(0)*	-1.641(0)	-5.346(1)*
BOL	-2.565(4)	-4.576(1)*	-2.315(0)	-4.693(0)*	-3.739(1)*	-4.748(4)*
BRA	-2.112(0)	-4.304(0)*	-4.184(2)*	-4.175(0)*	-2.066(0)	-4.015(0)*
BWA	-1.784(0)	-4.133(0)*	-4.120(1)*	-3.882(1)*	-3.411(2)*	-7.992(0)*
CAN	-2.283(1)	-3.344(1)*	-3.219(1)*	-5.073(0)*	-1.301(0)	-3.467(2)*
CHL	-0.932(0)	-3.596(0)*	-1.719(0)	-4.509(0)*	-2.053(0)	-6.898(0)*
CHN	-0.928(0)	-4.070(1)*	-1.464(0)	-4.550(0)*	-2.712(0)	-4.632(0)*
CIV	-1.309(0)	-4.011(0)*	-2.779(0)	-3.567(0)*	-1.578(0)	-4.107(0)*
CMR	-1.660(2)	-3.332(0)*	-1.147(0)	-6.625(0)*	-2.080(0)	-6.910(0)*
COL	-1.656(0)	-4.316(0)*	-2.495(1)	-3.603(0)*	-2.682(1)	-3.932(1)*
CRI	-1.782(0)	-5.033(0)*	-1.991(0)	-5.095(1)*	-2.829(0)	-5.677(0)*
CYP	-1.578(0)	-3.580(0)*	-1.820(0)	-5.665(0)*	-2.843(1)	-5.252(0)*
DEU	-1.421(0)	-4.989(0)*	-1.246(0)	-3.721(0)*	-2.200(1)	-3.277(0)*
DNK	-0.939(0)	-5.253(0)*	-2.175(0)	-5.127(0)*	-1.072(0)	-4.759(0)*
DOM	-2.473(0)	-3.873(3)*	-3.204(1)*	-4.482(0)*	-4.927(0)*	-7.266(0)*
DZA	-2.062(2)	0.565(1)	-2.327(0)	-5.332(1)*	-1.816(0)	-3.986(0)*
EGY	-2.445(1)	-3.967(1)*	-1.148(0)	-3.509(0)*	-2.528(1)	-4.850(0)*
ESP	-3.658(2)*	-4.875(0)*	-3.150(0)*	-3.241(3)*	-4.175(2)*	-4.230(5)*
FIN	-2.353(1)	-2.993(1)	-1.652(1)	-3.200(1)	-1.642(2)*	-3.472(0)
FRA	-3.900(3)*	-4.143(4)*	-1.926(1)	-3.516(0)*	-1.030(0)	-4.127(0)*
GAB	-2.413(1)	-3.320(0)*	-2.822(0)	-7.152(0)*	-2.412(0)	-4.846(0)*
GBR	-1.960(1)	-3.957(1)*	-3.116(1)*	-3.806(1)*	-2.934(1)	-3.556(0)*
GHA	-1.678(0)	-4.526(5)*	-1.514(2)	-5.753(1)*	-3.536(0)*	-8.334(0)*
GMB	-2.694(0)	-4.431(1)*	-2.896(0)	-4.884(0)*	-3.430(0)*	-3.257(1)*
GRC	-2.348(0)	-8.160(0)*	-2.822(0)	-6.881(0)*	-2.052(0)	-5.087(0)*

<sup>20</sup> South Korea has been excluded because of insufficient observations.

**Table 6.13 (Continued)**

	Saving		Investment		Current Account	
	Level	First Difference	Level	First Difference	Level	First Difference
GTM	-1.761(0)	-4.242(0)*	-1.821(0)	-4.328(0)*	-4.051(0)*	-4.870(3)*
HND	-1.000(1)	-5.984(0)*	-1.163(0)	-4.593(0)*	-2.955(0)	-5.806(0)*
HTI	-3.724(2)*	-3.749(2)*	-1.495(0)	-3.831(0)*	-1.721(0)	-6.335(0)*
HUN	-2.725(1)	-4.033(2)*	-2.373(1)	-3.328(0)*	-2.768(0)	-4.233(0)*
IND	-3.254(0)*	-7.264(0)*	-5.069(0)*	-5.924(1)*	-0.741(0)	-5.236(0)*
IRL	-1.108(0)	-4.962(0)*	-2.843(1)	-2.586(1)	-2.123(0)	-4.367(0)*
IRN	-3.225(0)*	-4.890(0)*	-2.511(0)	-4.830(0)*	-2.904(0)	-3.269(3)*
ISR	-4.225(2)*	-5.486(2)*	-1.211(0)	-4.436(0)*	-3.328(1)*	-5.045(1)*
ITA	-1.620(2)	-4.110(0)*	-3.172(0)*	-4.240(0)*	-1.801(0)	-3.849(0)*
JAM	-1.633(0)	-5.406(0)*	-2.486(0)	-4.140(2)*	-2.234(0)	-6.097(0)*
JOR	-2.996(0)	-4.226(0)*	-1.817(0)	-5.306(0)*	-3.518(0)*	-5.368(0)*
JPN	-0.670(1)	-2.877(1)	-1.930(1)	-3.047(1)*	-3.002(1)	-3.159(3)*
KEN	-4.956(0)*	-5.419(1)*	-2.361(1)	-7.887(0)*	-3.536(3)*	-3.651(4)*
LKA	-3.292(0)*	-5.615(0)*	-2.089(1)	-3.720(1)*	-4.014(0)*	-5.333(1)*
MAR	-2.276(0)	-6.531(0)*	-2.513(1)	-5.280(1)*	-1.785(0)	-5.541(0)*
MDG	-2.573(0)	-6.597(0)*	-2.332(0)	-6.727(0)*	-4.260(0)*	-4.939(1)*
MEX	-2.255(0)	-4.835(0)*	-2.676(0)	-4.295(0)*	-2.546(0)	-4.818(0)*
MLI	-1.461(0)	-4.199(0)*	-2.052(0)	-5.782(0)*	-2.755(0)	-5.043(0)*
MWI	-1.153(0)	-6.146(0)*	-2.801(0)	-7.332(0)*	-3.063(3)*	-8.457(0)*
NER	-3.268(0)*	-3.941(3)*	-3.804(0)*	-5.350(3)*	-4.249(3)*	-3.252(2)*
NGA	-2.985(0)	-4.323(0)*	-2.285(0)	-4.244(0)*	-3.193(0)*	-4.373(1)*
NLD	-2.428(0)	-4.270(0)*	-2.271(0)	-4.108(0)*	-2.893(2)	-5.304(0)*
NOR	-1.539(0)	-4.596(1)*	-1.214(0)	-3.954(0)*	-1.393(0)	-4.494(1)*
NZL	-1.819(0)	-3.872(0)*	-1.676(0)	-3.975(0)*	-2.396(0)	-6.022(0)*
PAK	-0.743(0)	-4.525(0)*	-0.627(0)	-5.028(0)*	-0.678(0)	-5.382(0)*
PAN	-4.013(0)*	-6.426(0)*	-1.630(0)	-3.794(0)*	-2.597(0)*	-5.565(0)*
PER	-2.818(1)	-9.008(0)*	-2.521(0)	-5.252(0)*	-3.588(0)	-6.589(0)*
PHL	-2.031(0)	-6.114(0)*	-2.323(0)	-4.425(1)*	-1.839(0)	-4.362(1)*
POL	-3.224(2)*	-9.551(0)*	-2.086(1)	-3.164(0)*	-2.791(0)	-5.109(0)*
PRT	-1.575(0)	-3.843(0)*	-5.053(1)*	-4.105(2)*	-1.905(0)	-6.271(0)*
PRY	-2.117(0)	-5.579(0)*	-6.352(1)*	-4.184(1)*	-2.471(1)	-4.107(1)*
SEN	-0.370(3)	-6.191(2)*	-0.100(1)	-7.903(0)*	-1.675(3)*	-9.717(0)*
SLV	-2.241(0)	-6.058(0)*	-1.690(0)	-4.184(1)*	-3.683(1)	-3.442(4)*
SWE	-3.385(1)*	-4.146(1)*	-1.701(0)	-3.813(0)*	-0.899(0)	-4.419(0)*
SYR	-1.658(0)	-4.436(0)*	-2.404(1)	-3.392(0)*	-2.062(0)	-4.498(0)*
TGO	-3.195(0)*	-5.271(2)*	-3.594(0)*	-3.949(2)*	0.720(4)	-7.727(3)*
THA	-3.100(3)*	-3.985(0)*	-1.842(1)	-3.008(0)*	-1.457(0)	-4.128(0)*
TUN	-2.874(0)	-4.760(5)*	-3.149(2)*	-5.360(3)*	-2.474(0)*	-4.843(0)*
TUR	-2.096(1)	-3.911(1)*	-2.303(0)	-6.429(0)*	-5.283(0)	-7.418(1)*
UGA	-1.524(0)	-5.735(0)*	-0.155(0)	-7.017(0)*	-2.886(0)	-8.853(0)*
URY	-4.518(0)*	-7.680(0)*	-1.888(0)	-4.687(1)*	-2.704(0)	-4.691(0)*
USA	-1.849(3)	-4.460(1)*	-2.018(0)	-4.560(0)*	-0.714(0)*	-3.205(0)*
VEN	-4.102(0)*	-5.741(1)*	-4.015(1)*	-5.447(4)*	-4.920(1)	-6.437(4)*
ZAF	-3.914(0)*	-5.251(0)*	-2.183(0)	-5.981(0)*	-2.693(1)	-7.621(0)*
ZMB	-5.493(0)*	-5.680(1)*	-4.072(0)*	-7.319(0)*	-2.235(0)	-4.451(0)*
ZWE	-2.438(0)	-5.680(1)*	-0.861(0)	-5.201(0)*	-1.848(0)	-4.074(0)*

The current account solvency requires that the current account balance should be stationary since the current account deficits can not explode. In other words, the no Ponzi game condition imposes a constraint on the sustainability of the latter. The stationarity of the current account implies that saving and investment should be cointegrated with a unitary coefficient. Our sample involves some stationary saving and investment series; however, following Coakley et al. (2004), we examine the long run relationship between saving and investment using the Mean Group approach developed by Pesaran and Smith (1995). Pesaran and Smith (1995) argue that the pooled panel estimators are inconsistent if the panel were characterized by heterogeneous cointegrating relationships across different units. The mean group approach provides a robust measure of long-run saving investment association by controlling for country heterogeneity and group-wise heteroskedasticity. On the one hand, the mean group estimator avoids some problems in panel unit root and cointegration testing. For example, as the number of cross sections in the sample grows, the panel unit root tests suffer from size distortions and the assumption of cross sectional independence becomes unrealistic. On the other hand, including a linear time trend leads to the reduction of the power of tests. The panel cointegration tests have the difficulty of formulating the appropriate hypothesis. The null hypothesis of no cointegration results in lower power of the tests. Hence, the specification of the null hypothesis is still a controversial issue in panel data cointegration analysis (Baltagi and Kao, 2000).

The original Feldstein Horioka regression depends on the period averages of saving and investment. Thus, the Feldstein Horioka regression examines the low frequency data and does not incorporate the business cycle effects embodied in the time series dimension of the data. The following equations represent the Feldstein Horioka cross sectional regression.

$$\bar{I}_i = \alpha + \beta \bar{S}_i + v_i \quad i=1, \dots, N.$$

$$\bar{I}_i = T^{-1} \sum_{t=1}^T I_{it} \quad \text{and} \quad \bar{S}_i = T^{-1} \sum_{t=1}^T S_{it}$$

In order to apply the mean group procedure, we first estimate the saving retention coefficient for each country separately. Then, we find out the average and the standard deviation of these country specific coefficients. The following formulations

show the mean group estimator and its standard deviation. The mean group estimator is relevant in case of non-stationary heterogeneous panel settings. It avoids spurious regressions that arise due to the lack of cointegration. Most of the series in our sample are found to be stationary in first differences. The evidence of cointegration between saving and investment indicates the existence of a long run relationship between these variables.

$$\hat{\beta}_{MG} = \sum_{i=1}^N \hat{\beta}_i / N$$

$$se(\hat{\beta}_{MG}) = \sigma(\hat{\beta}_i) / \sqrt{N}$$

Cross sectional dependence is quite relevant in Feldstein Horioka regressions since shocks that have impact on saving and investment in one country also influence the saving and investment in other countries. On the other hand, as the cross sectional dimension of the sample becomes larger, the assumption of cross sectional independence becomes unrealistic. Hence, we also employ an alternative method proposed by Pesaran (2003) that takes the cross sectional dependence into account. In this second approach the time series OLS regressions for individual countries are augmented by the cross sectional means of the variables defined as follows:

$$I_t = \alpha + \beta S_t + \tau \bar{I}_t + \phi \bar{S}_t + v_t$$

$$\bar{I}_t = N^{-1} \sum_{i=1}^N I_{it} \text{ and } \bar{S}_t = N^{-1} \sum_{i=1}^N S_{it}.$$

Again, we estimate the mean group estimator by taking the simple average of individual country coefficients defined by the following formulation and find out the standard deviation of these coefficients.

$$\hat{\beta}_{MG} = \sum_{i=1}^N \hat{\beta}_i / N$$

Table 6.14 shows the cross sectional Feldstein Horioka estimator (CS), mean group estimator (MG) and the mean group estimator accommodated for cross sectional dependence (CMG). The cross sectional Feldstein Horioka estimator (CS) is considerably high confronting the two thirds rule proposed by Feldstein and Bacchetta

(1991)<sup>21</sup>. On the other hand, the mean group and accommodated mean group estimators are at around 0.52 implying a moderately high correlation between saving and investment. The hypothesis that  $\beta=1$  is rejected for all CS, MG and CMG estimators implying that these estimators are significantly different from 1. Table 6.14 also shows the estimators for industrialized and developing countries. Again, we reject the null hypothesis for MG and CMG estimators. Table 6.15 shows the CS, MG and CMG estimators for sub-samples according to the income level. As can be seen from the table, results are in line with the findings reported in Table 6.15.

**Table 6.14: Saving Investment Coefficients**

				Industrialized Countries			Developing Countries		
	$\beta$	se( $\beta$ )	H0: $\beta=1$	$\beta$	se( $\beta$ )	H0: $\beta=1$	$\beta$	se( $\beta$ )	H0: $\beta=1$
CS	0.617	0.044	-8.774*	0.544	0.118	-3.862*	0.645	0.052	-6.791*
MG	0.512	0.040	-12.13*	0.579	0.086	-4.883*	0.488	0.045	-11.40*
CMG	0.526	0.047	-10.10*	0.608	0.095	-4.140*	0.495	0.054	-9.358*

\* denotes significance at 5 % level

**Table 6.15: Saving Investment Coefficients for Sub-Samples**

	High Income Countries		Upper Middle Income Countries		Lower Middle Income Countries		Low Income Countries	
	$\beta$	se( $\beta$ )	$\beta$	se( $\beta$ )	$\beta$	se( $\beta$ )	$\beta$	se( $\beta$ )
CS	0.49	0.12	0.43	0.14	0.78	0.08	0.49	0.1
MG	0.56	0.08	0.43	0.1	0.54	0.07	0.46	0.07
CMG	0.59	0.09	0.31	0.12	0.61	0.09	0.48	0.07

\* denotes significance at 5 % level

We run an augmented regression that incorporates exchange rate regime (ERR), governance (GOV), capital controls (CC), openness to foreign trade (OPEN) and

<sup>21</sup> Feldstein and Bachetta (1991) propose that the two third of national savings are retained within domestic country to finance domestic investment.

financial deepening (FD) into the saving investment regression. The augmented regression can be described as follows:

$$I_{it} = \alpha + \beta S_{it} + \delta ERR_{it} + \theta GOV_{it} + \eta CAPCON_{it} + \mu OPEN_{it} + \vartheta FINDEV_{it} + \varepsilon_{it}$$

We find out the MG and CMG for the whole sample, industrialized countries and developing countries (Table 6.16). However, for the whole sample, developed countries and the developing countries, the mean group coefficients of the explanatory variables except saving are insignificant at 5% level. On the other hand, the cross sectional mean group estimator for saving is significant while the coefficients of the other explanatory variables are insignificant. For the developing countries sub-sample, the cross sectional mean group (CMG) coefficients of all variables including saving are insignificant.

**Table 6.16: MG and CMG Estimators (Augmented Regression)**

			<b>S</b>	<b>GOV</b>	<b>ERR</b>	<b>CAPCON</b>	<b>OPEN</b>	<b>FINDEV</b>
Full Sample	MG	Mean	0.429	0.042	0.075	1.576	0.049	0.020
		Std. Dev.	0.053	0.031	0.153	1.844	0.222	0.017
Developed Countries	MG	Mean	0.627	-0.037	0.358	1.215	0.013	0.046
		Std. Dev.	0.081	0.050	0.354	1.679	0.048	0.034
Developing Countries	MG	Mean	0.344	0.076	-0.047	1.732	0.065	0.009
		Std. Dev.	0.063	0.038	0.157	2.554	0.033	0.019
Full Sample	CMG	Mean	0.312	0.079	0.273	0.960	-0.056	-0.037
		Std. Dev.	0.096	0.093	0.522	3.141	0.061	0.046
Developed Countries	CMG	Mean	0.600	0.180	0.683	0.633	-0.091	-0.005
		Std. Dev.	0.153	0.133	0.447	2.667	0.116	0.048
Developing Countries	CMG	Mean	0.184	0.034	0.092	1.104	-0.040	-0.051
		Std. Dev.	0.116	0.120	0.227	4.398	0.072	0.063

## 6.6. Concluding Remarks

In this chapter, we examine the correlation between saving and investment for a panel data set of 75 countries covering the period 1984-2001. We find out that there is still a strong correlation between saving and investment and the saving retention coefficient is even higher for the between country (long run) regression of investment on saving.

Investment is negatively related to the current account balance for the pooled data and the size of the coefficient is -0.37. However, the sign of the correlation coefficient is positive for the between country regression. This implies that, in the long run, countries that have higher levels of investment, at the same time, are those that run positive current account positions. On the other hand, the coefficient of the correlation between national saving and the current account balance is at around 0.34.

The sign of the correlation between saving and investment is 0.48 for the pooled regression. However, the correlation coefficient has the size of 0.63 for the between country regression. The relatively higher size of the between regression coefficient implies that countries with high saving rates, at the same time, have high investment rates. Countries can smooth consumption within periods depending on foreign savings when the domestic saving is deficient. The intertemporal consumption smoothing leads to the widening of the saving investment gap, namely the current account deficit. However, in the long run, no Ponzi game condition implies a close correlation between saving and investment rates.

The long run saving investment correlation for the sample of European Union countries is approximately 0.24 implying that the economic integration leads to the decline of saving investment correlation. Lastly, we run an extended model of saving investment correlation including some other explanatory variables like governance, exchange rate regime, openness, capital controls and the level of financial deepening. Results show that, the coefficient of governance is positive and significant implying that, better governance leads to the higher levels of investment. On the other hand, openness is positively and significantly correlated to investment while the relationship between investment and the level of financial deepening is insignificant. Like openness variable,

coefficient of the capital controls variable is positive and significant for the pooled regression.

We also apply the fixed effects, random effects and Arellano Bond estimation techniques for different sub-samples. As far as the fixed and random effects estimations considered, the results show that saving is the only variable whose coefficient is significant for all regressions. It is positive and generally around 0.5. On the other hand, the coefficients of rest of the variables are generally insignificant with the exception of capital controls and openness. On the other hand, for the whole sample, the Arellano Bond estimation shows that the coefficients of all variables except the financial deepening variable are significantly related to the investment rate.

In order to examine the long run relationship between saving and investment, we apply the mean group procedure and the cross sectional mean group procedure which takes the cross sectional dependence into account. Results show that the saving investment coefficient is at around 0.52. We again run our augmented regression; however, for the whole sample, developed countries and developing countries, the mean group coefficients of the explanatory variables except saving are insignificant. The cross sectional mean group estimators show similar results.

## **CHAPTER 7**

### **CONCLUSION**

This study tries to unfold the determinants of the current account deficits for a large panel data set covering 76 countries for the period 1984-2001. Our sample consists of both industrialized and developing countries. While analyzing the movements in the current account balances, we group countries according to their regional distribution, income level, the level of development and the level of indebtedness. Doing this, we stress certain commonalities and particular characteristics of countries in terms of economic structure, investment and foreign trade patterns.

Descriptive analysis shows that the current account balances of industrialized countries follow significantly diverging patterns; while countries like Japan, Netherlands, Belgium and Norway run current account surpluses, some others like USA, New Zealand and Australia experience considerably high current account deficits. On the other hand, most of the developing countries have negative current account positions. Among these countries, the oil exporting countries run significantly large current account surpluses. Furthermore, when we compare the within country and between country variations in the current account balances, we observe that primary goods exporting countries, being exposed to the terms of trade fluctuations, show large within country variations. However, countries with a relatively deeper industrial base do not exhibit significant dispersions in annual current account balances.

Besides the other explanatory variables like the terms of trade, capital controls, income growth, real exchange rate, openness to foreign trade and financial deepening, we stress the role of institutional and macroeconomic factors underlying the dynamics of the current account balance. We observe that industrialized countries have strong

institutions and better governance compared to the developing countries. The quality of institutions is strongly related to the level of development; less developed countries have higher levels of risk and instability. We do not observe an exact relationship between the exchange rate flexibility and the level of development. On the other hand, there is a negative correlation between the income level and the capital control index; that is, higher income countries generally have lower capital control index.

As far as the terms of trade index is considered, we do not observe large fluctuations in the whole period averages of the terms of trade ratios between countries except oil exporting countries. Rather, the terms of trade is highly volatile within a country through time. The descriptive analysis of the financial deepening variable shows that the depth of the financial system is strongly related to the level of development implying that high income countries have generally deeper and more sophisticated financial systems. On the other hand, summary statistics for the explanatory variables show that, the standard deviation of the between data is higher than that of the within data for most of the variables except the terms of trade.

We estimate our model for the full sample of 76 countries and four sub-samples. The coefficient of the lagged current account deficit is significant and positive in all regressions. On the other hand, for the whole sample and all sub-samples, it is less than one implying that current account is stationary. The size of the coefficient reveals that transitory shocks to the current account show a low degree of persistence, that is, half life of these shocks is less than one year.

The coefficient of governance is significant and positive for the whole sample and all sub-samples except the group of industrialized countries. This has important implications for economic policy making; better institutional set up results in higher degree of sustainability of increasing current account deficits. Countries with better governance and strong institutions can sustain higher levels of current account deficits. For the industrial countries sub-sample, the coefficient of governance is insignificant. On the other hand, exchange rate regime has a significant and negative coefficient for only full sample and full sample excluding Sub-Saharan Africa. Therefore, increasing flexibility of exchange rate regime has a decreasing effect upon the current account deficits. Increasing flexibility seems to provide a self-correcting mechanism for the

current account deficit. In other words, countries with relatively more flexible exchange rate regimes can easily accommodate to external shocks and the exchange rate flexibility act as a disciplining device on current account deficits.

The coefficient of terms of trade is significant and negative for all regressions. Terms of trade variable refers to the relative price effect upon the current account deficit. In this context, it seems that current accounts are not isolated from terms of trade shocks yet. Our results provide an evidence for Harberger-Laursen-Metzler effect in the sense that deterioration in the terms of trade, by leading to a decline in the current income and savings results in widening current account deficits. The results show that, except for industrialized countries, the real exchange rate is negatively and significantly related to the current account deficits. The highest coefficient of real exchange rate in absolute terms is estimated for the sample of developing countries excluding least developed countries. This significant relationship also refers to the prominence of trade balance component of current account balance since real exchange rate affects current account balance through mainly the trade balance. Depreciation of the real exchange rate results in smaller current account deficits, leading to the increase in exports and decline of imports.

The coefficient of capital control index is insignificant for all samples except for the sample of developing countries excluding least developed countries (negative and significant at 10%). This implies that there is no significant evidence on the relation between capital account liberalization and current account performance. We also find a significant and positive relation between GDP growth and current account deficit for all samples, except for industrialized countries. This significant relation explains the sudden reversals of current account balances from deficits to surpluses following severe output contractions in some countries –like Argentina- experiencing macroeconomic crises.

There is also a positive and significant relation between financial deepening – proxied by the ratio of gross credit supplied by the banking system to GDP- and the current account deficit. Increasing depth and sophistication of the financial system shows the relaxation of the borrowing constraints since households can more easily smooth consumption over time. Thus, a relatively more sophisticated financial system is associated with widening current account deficits. The coefficient of the openness

variable is negative and significant for the whole sample and all sub-samples except the developing countries sub-sample indicating that relatively more open economies experience lower current account deficits.

The estimation results with additional explanatory variables show that the coefficient of the budget balance variable is negative and significant implying that smaller budget deficits lead to decreasing current account deficits. This result supports the twin deficit view that budget deficits co-exist with the current account imbalances. On the other hand, the inflation rate is positively and significantly related to the current account deficit although the size of the coefficient is extremely small. Following an increase in the domestic inflation rate, imports increase while exports decline as foreign goods become relatively cheaper. The coefficient of the government expenditure variable is positive and significant implying that higher government expenditure is associated with widening current account imbalances. Lastly, we introduce the country size proxied by the ratio of GDP to that of USA. However, the coefficient of the country size variable is insignificant.

We analyze the saving investment correlation in order to test the validity of the Feldstein-Horioka puzzle. Both saving and investment ratios have displayed between standard deviations higher than within standard deviations which means that saving and investment ratios show wider between-country variations than variations within a cross section across time. Scatter plot diagrams verify a strong positive correlation between saving and investment both in pooled, between and within dimensions. Again scatter plot diagrams show a positive relation between saving and current account balance in both pooled, between and within data. However, between data shows that investment and the current account balance are positively related while this relation has a negative sign when the within data is considered.

We find that the saving retention coefficient is 0.479, 0.439 and 0.631 for pooled, within and between regressions respectively. The relatively higher value of the last one implies that saving investment correlation is stronger in the long run. Estimations for the sub-samples of industrialized and developing countries give exactly the same results for the saving retention coefficient. On the other hand, in order to observe the impact of integration on saving investment correlation, we run the Feldstein-

Horioka regression for a sample of European Union countries. We do not observe a significant change in the saving retention coefficient for the pooled and within regressions. However, the coefficient of the between regression displays a drastic decline in the saving investment correlation. This shows that economic and financial integration leads to a weaker association between national saving and domestic investment rates.

We also run an augmented regression including governance, exchange rate regime, capital controls, openness and financial deepening as explanatory variables. However, for the pooled and within regression, the coefficients of all variables except saving and openness and governance are insignificant. The coefficient of governance is positive and significant implying that better governance is associated with higher levels of investment. In the same manner, openness is positively and significantly related to the investment rate. This may be due to the fact that higher levels of openness indicate the existence of a large export base which embodies ample opportunities for investors. As far as the between regression considered, governance is no longer significantly related to the investment rate.

In order to examine the long run relationship between saving and investment, we apply the mean group procedure and the cross sectional mean group procedure which takes the cross sectional dependence into account. Results show that the saving investment coefficient is at around 0.52. We again run our augmented regression; however, for the whole sample, developed countries and developing countries, the mean group coefficients of the explanatory variables except saving are insignificant. The cross sectional mean group estimators show similar results.

#### *Current Account in Policymaking Process-Is There any Scope for Policy Action?*

Following the financial and currency crises which started to be common to all emerging markets during the 1990s, there is a growing interest in the current account imbalances from the viewpoint of policymakers as well. This is partly due to the fact that the current account imbalances can be perceived as a signal for macroeconomic fragility in case of a financial distress. Some researchers developed early warning models in order to assess the financial vulnerability of the emerging economies and gauge to what extent these economies are crises prone (Goldstein et al., 2000). On the

other hand, the current account imbalances played a major role in generation of macroeconomic policies. Hence, whether the current account imbalances should be a matter of public policy concern in economic decision making process continued to be a controversial issue.

From the policy maker's perspective, the current account balance is neither a policy tool nor a policy target. Authorities do not have a direct control over the current account balance. On the other hand, the current account balance is not an ultimate target like inflation or growth. However, the policymakers should take the current account balance into account while developing policies as the current account balance provides a sound reflection of the stance of the economy. Although the current account deficits stem from the increasing investment opportunities, they have repercussions regarding the overall economic situation. For example, external debt and liquidity constraints that derive from the current account deficits necessitate some policy actions related to the debt servicing of the economy and the choice of exchange rate regime. The current account deficits also reflect the vulnerability and crises proneness of the economy. The current account deficits should not be assessed as a single macroeconomic variable; rather, such imbalances should be evaluated together with the growth targets of the economy, its vulnerability to external shocks, its trade balance and export base, the dynamics of the terms of trade and the fragility of the financial system (Knight and Scacciavillani, 1998). Hence, policy makers should pay close attention to the current account imbalances.

Before the 1980s, the traditional view on the current account imbalances was that such imbalances pose important problems both for the deficit and surplus countries. Thus, the current account imbalances are not sustainable indefinitely and should be avoided. On the other hand, according to the intertemporal approach to the current account, the current account balance results from the forward-looking saving and investment decisions of private agents and, as far as the public sector is in balance, should not be a public policy concern. Following the UK Chancellor Nigel Lawson's speech to the International Monetary Fund in 1988, the view that the current account imbalances which result from the private sector saving investment decisions should not be a public policy concern came to be known as the Lawson Doctrine. The current

account imbalances stem from either fiscal deficits or the deficiency of private saving to meet the private investment. The Lawson Doctrine states that, the current account deficits are not a sign of trouble if they do not arise as a result of public sector deficits. The underlying assumption is that, eliminating the fiscal deficits by increasing taxes affects the economy in a completely different way than financing the deficit by issuing bonds. However, according to the Ricardian equivalence, changing the means of financing the public deficit does not have an impact on the current account deficit. Ricardian equivalence states that, a public deficit which implies a fall in public savings leads to a rise in private savings because private agents, expecting an increase in future taxes, are inclined to save more. As a result, full Ricardian equivalence proposes that, the decline in public savings is offset by the increase in private saving without any impact on the current account balance. The current account deficits resulting from the fiscal imbalances act in the same way as the deficits which derive from a shift of private sector saving investment decisions.

The intertemporal approach does not define an excessive amount of the current account deficits. According to this approach, the current account deficits do not pose problems as they are the result of the private sector saving investment decisions. On the other hand, the Lawson Doctrine points to the source of the current account deficits, that is, there is no need to worry as far as these deficits do not accompany public sector deficits. However, sometimes, the level of the current account deficit may be a cause for concern rather than its source. For example, it may be a signal for foreign investors and may come to a sudden reversal with capital flight. On the other hand, the current account deficits result in the overvaluation of the exchange rate. The overvalued exchange rate causes the contraction of the export and widening of imports which leads to a further worsening of the current account deficit. Moreover, the current private sector liabilities are often contingent public sector liabilities (Reisen, 1998). Thus, even if the public sector is in balance, the private sector saving investment gap may imply future fiscal problems.

Most of the studies argued that the current account balances should not be taken as a signal for economic crises as far as the public sector is balanced. However, that was the case for Chile at the beginning of 1980s, which experienced a deep financial crisis

with a balanced public sector accounts and increasing investment. Similarly, during the preceding years of the currency crises in Mexico, authorities assured that there was no reason to worry as the public balances were under control. Hence, such experiences show that the validity of the Lawson Doctrine should be questioned on the grounds that independent of the public sector accounts, the current account deficits still have potential to trigger a macro economic distress with liberalized capital accounts. Therefore, there is still room to worry about current account deficits from the viewpoint of policy makers.

## REFERENCES

- Ahearne, A. G., Grier, W. L. and Warnock, F. E. (2004) "Information Costs and Home Bias: An Analysis of US Holdings of Foreign Equities", *Journal of International Economics*, 62, 313-336.
- Ahmed, S. (1986) "Temporary and Permanent Government Spending in an Open Economy: Some Evidence for the United Kingdom", *Journal of Monetary Economics*, 17, 197-224.
- Ahmed, S. (1987) "Government Spending, the Balance of Trade and the Terms of Trade in British History", *Journal of Monetary Economics*, 20, 195-220.
- Akyüz, Y. and Cornford, A. (1999) "Capital Flows to Developing Countries and the Reform of the International Financial System", UNCTAD Discussion Paper No. 143.
- Arellano, M. and Bond, S. (1991) "Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equation", *Review of Economic Studies*, 58, 277-297.
- Arellano, M. and Boyer, O. (1995) "Another Look at the Instrumental Variable Estimation of Error Component Models", *Journal of Econometrics*, 68, 29-51.
- Artis, M.J. and Bayoumi, T. A. (1990) "Saving, Investment, Financial Integration and the Balance of Payments", *IMF Staff Studies for the World Economic Outlook*, September, 19-34.
- Backus, D. K., Kehoe, P.J. and Kydland, F. E. (1994) "Dynamics of the Trade Balance and the Terms of Trade: The J-Curve?", *American Economic Review*, 84(1), 84-103.
- Baltagi, B. H. (1995), *Econometric Analysis of Panel Data*, John Wiley and Sons, Surrey.
- Baltagi, B. H. and Kao, C. (2000) "Non-stationary Panels, Co-integration in Panels, and Dynamic Panels: A Survey", *Advances in Econometrics*, 15, 7-51.
- Barro, R. J. (1988) "The Ricardian Approach to Budget Deficits", NBER Working Papers, No.2685.

- Baxter, M. and Crucini, M. J. (1993) "Explaining Saving Investment Correlations", *American Economic Review*, 83(3), 416-436.
- Beck, T. and Levine, R. (2003) "Legal Institutions and Financial Development", NBER Working Papers, No.10126.
- Bergin, P. R. and Sheffrin, S. M. (2000) "Interest Rates, Exchange Rates and Present Value Models of the Current Account", *Economic Journal*, 110, 535-558.
- Blanchard, O. (1985) "Debt, Deficits and Finite Horizon", *Journal of Political Economy*, 93, 223-247.
- Blanchard, O. and Giavazzi, F. (2002) "Current Account Deficits in the Euro Area: The End of the Feldstein Horioka Puzzle", *Brookings Papers on Economic Activity*, 2, 147-186.
- Blundell, R. and Bond, S. (1998) "Initial Conditions and Moment Restrictions in Dynamic Panel Data Models", *Journal of Econometrics*, 87, 115-143.
- Boratav, K. Gabriele, A. and Parikh, A. (2000) "Instability and Volatility of Capital Flows to Developing Countries", *World Economy*, 1031-1056.
- Bosworth, B. P., Collins, S. M. and Reinhart, C. M. (1999) "Capital Flows to Developing Economies: Implications for Saving and Investment", *Brookings Papers on Economic Activity*, 1999(1), 143-180.
- Brock, P. L. (1996) "International Transfers, the Relative Price of Non-traded Goods and the Current Account", *Canadian Journal of Economics*, 29, 163-180.
- Buckley, S. (2002) "Trading Costs and Home Bias: Evaluating a Proposal for Resolving the Feldstein Horioka Puzzle", Stanford Institute for Economic Policy Research, Discussion Paper 02/14.
- Buiter, W. H. (1981) "Time Preference and International Lending and Borrowing in an Overlapping-Generations Model", *Journal of Political Economy*, 89, 769-797.
- Burda, M. C. and Gerlach, S. (1992) "Intertemporal Prices and the US Trade Balance", *American Economic Review*, 82(5), 1234-1253.
- Bussiere, M., Fratzscher, M. and Müller, G. J. (2004) "Current Account Dynamics in OECD and EU Acceding Countries-An Intertemporal Approach", European Central Bank Working Paper 311.
- Cadoret, I. (2001) "The Saving Investment Relation: A Panel Data Approach", *Applied Economics Letters*, 8, 517-520.

Calderon, C. A., Chong, A. and Zanforlin, L. (2001) "Are African Current Account Deficits Different? Stylized Facts, Transitory Shocks and Decomposition Analysis", IMF Working Paper 01/04.

Calderon, C. A., Chong, A. and Loayza, N. V. (2002) "Determinants of Current Account Deficits in Developing Countries", *Contributions to Macroeconomics*, 2:1, Article 2.

Calvo, G. A., Izquierdo, A. and Mejia, L. F. (2004) "On the Empirics of Sudden Stops: The Relevance of Balance Sheet Effects", NBER Working Papers, No.10520.

Calvo, G. A., Izquierdo, A. and Talvi, E. (2003) "Sudden Stops, The Real Exchange Rate and Fiscal Sustainability: Argentina's Lessons", NBER Working Papers, No. 9828.

Cameron, R. (1993), *A Concise Economic History of the World*, Oxford University Press, New York.

Campbell, J. Y. (1987) "Does Saving Anticipate Declining Labor Income? An Alternative Test of the Permanent Income Hypothesis", *Econometrica*, 55, 1249-1274.

Campbell, J. Y. and Shiller, R. J. (1987) "Cointegration and Tests of Present Value Models", *Journal of Political Economy*, 95, 1062-1088.

Cashin, P. and McDermott, J. C. (1998) "Are Australia's Current Account Deficits Excessive?", *Economic Record*, 74 (227), 346-61.

Cashin, P. and McDermott, J. C. (2002) "Terms of Trade Shocks and the Current Account: Evidence from Five Industrial Countries", *Open Economies Review*, 13, 219-235.

Chinn, M. D. and Lee, J. (1998) "The Current Account and the Real Exchange Rate: A Structural VAR Analysis of Major Currencies", NBER Working Papers, No.6495.

Chinn, M. D. and Prasad, E. S. (2003) "Medium-term Determinants of Current Accounts in Industrial and Developing Countries: An Empirical Exploration", *Journal of International Economics*, 59, 47-76.

Chinn M. D. and Ito, H. (2005) "What Matters for Financial Development? Capital Controls, Institutions and Interactions", mimeo.

Coakley, J., Kulasi, F. and Smith, R. (1998) "The Feldstein Horioka Puzzle and Capital Mobility- A Review", *International Journal of Finance and Economics*, 3, 169-188.

Coakley, M. D., Hasan, F. and Smith R. (1999) "Saving, Investment and Capital Mobility in LDCs", *Review of International Economics*, 7(4), 632-640.

Coakley, J. Fuertes, A. M. and Spagnolo, F. (2004) "Is the Feldstein-Horioka Puzzle History?", *The Manchester School*, 72(5), 569-590.

- Coiteux, M. and Oliver, S. (2000) "The Saving Retention Coefficient in the Long Run and in the Short Run: Evidence from Panel Data", *Journal of International Money and Finance*, 19, 535-548.
- Daniel, B. C. (1997) "Precautionary Saving and Persistent Current Account Imbalance", *Journal of International Economics*, 42, 179-193.
- Davidson, P. (2000) "Is a Plumber or a New Financial Architect Needed to End Global International Liquidity Problems?", *World Development*, 28(6), 1117-1131.
- Davidson, P. "The Future of the International Financial System", paper presented at the Conference on the Future of Economics at Cambridge University, September 18, 2003.
- Debelle, G. and Faruqee, H. (1996) "What Determines the Current Account? A Cross-sectional and Panel Approach", IMF Working Paper 96/58.
- Dooley, M., Frankel, J. and Mathieson, D. J. (1987) "International Capital Mobility: What do Saving-Investment Correlations Tell Us?", IMF Staff Papers, 34, 503-529.
- Edwards, S. (1995) "Why are Saving Rates So Different Across Countries?: An International Comparative Analysis", NBER Working Papers, No.5097.
- Edwards, S. (2001) "Does the Current Account Matter?", NBER Working Papers, No.8275.
- Edwards, S. (2004a) "Financial Openness, Sudden Stops and Current Account Reversals", NBER Working Papers, No. 10277.
- Edwards, S. (2004b) "Thirty Years of Current Account Imbalances, Current Account Reversals and Sudden Stops", IMF Staff Papers (Special Issue), Vol.51.
- Eichengreen, B. (1992), *Golden Fetters*, Oxford University Press, New York.
- Eichengreen, B. (2003), *Capital Flows and Crises*, MIT Press, Cambridge MA.
- Eichengreen, B., Hausmann, R. and Panizza, U. (2003) "Currency Mismatches, Debt Intolerance and Original Sin: Why They are not the Same and Why It Matters", NBER Working Papers, No.10036.
- Elliott, G. and Fatas, A. (1996) "International Business Cycles and the Dynamics of the Current Account", *European Economic Review*, 40, 361-387.
- Enders, W. And Lee, B. (1990) "Current Account and Budget Deficits: Twins or Distant Cousins?", *The Review of Economics and Statistics*, 72(3), 373-381.

- Engel, C. and Kletzer, K. (1986) "Tariffs, Saving and the Current Account", NBER Working Papers, No. 1869.
- Feldstein, M. S. and Horioka, C. Y. (1980) "Domestic Saving and International Capital Flows", *Economic Journal*, 90, 314-329.
- Feldstein, M. (1983) "Domestic Saving and International Capital Flows in the Long Run and the Short Run", *European Economic Review*, 21, 129-51.
- Feldstein M. S. and Bacchetta, P. (1989) "National Saving and International Investment", NBER Working Papers, No. 3164.
- Fidrmuc, J. (2003) "The Feldstein-Horioka Puzzle and Twin Deficits in Selected Countries", *Economics of Planning*, 36, 135-152.
- Fleming, J. M. (1962) "Domestic Financial Policies Under Fixed and Under Floating Exchange Rates" IMF Staff Papers, 9, 369-379.
- Frankel, J. A. (1992) "Measuring International Capital Mobility-A Review", *American Economic Review*, 82, 197-202.
- Galor, O. and Lin S. (1994) "Terms of Trade and Current Account Dynamics: A Methodological Critique", *International Economic Review*, 35(4), 1001-1014.
- Garmlich, E. "Budget and Trade Deficits-Linked, Both Worrisome in the Long Run, but not Twins", Euromoney Bond Investors Congress, London, February 25, 2004.
- Ghosh, A. R. (1995) "International Capital Mobility Amongst the Major Industrialized Countries: Too Little or Too Much?", *Economic Journal*, 105, 107-128.
- Ghosh, A. R. and Ostry, J. D. (1995) "The Current Account in Developing Countries: A Perspective from Consumption-Smoothing Approach", *World Bank Economic Review*, 9(2), 305-333.
- Ghosh, A. R. and Ostry, J. D. (1997) "Macroeconomic Uncertainty, Precautionary Saving and the Current Account", *Journal of Monetary Economics*, 40, 121-139.
- Giannone, D. and Lenza, M. (2004) "The Feldstein Horioka Fact", Centre for Economic Policy Research, Discussion Paper No. 4610.
- Glick, R. and Rogoff, K. (1995) "Global versus Country-Specific Productivity Shocks and the Current Account", *Journal of Monetary Economics*, 35, 159-192.
- Goldstein, M., Kaminsky, G. L. and Reinhart, C. R. (2000) *Assessing Financial Vulnerability: An Early Warning System for Emerging Markets*, Washington: Institute for International Economics.

- Gruber, J. W. (2004) "A Present Value Test of Habits and the Current Account", *Journal of Monetary Economics*, 51, 1495-1507.
- Guidotti, P. E., Sturzenegger, F. and Villar, A. (2004) "On the Consequences of Sudden Stops", *Economia*, 4(2), 171-214.
- Harberger, A. C. (1950) "Currency Depreciation, Income and the Balance of Trade", *Journal of Political Economy*, 58(1), 47-60.
- Hericourt, J. and Maurel, M. (2005) "The Feldstein Horioka Puzzle Revisited: A European-Regional Perspective", William Davidson Institute, Working Paper No. 763.
- Ho, T. (2002) "The Feldstein-Horioka Puzzle Revisited", *Journal of International Money and Finance*, 21, 555-564.
- Hoffmann, M. (2003) "International Macroeconomic Fluctuations and the Current Account", *Canadian Journal of Economics*, 36, 401-420.
- Hoffmann, M. (2004) "International Capital Mobility in the Long Run and the Short Run: Can We Still Learn from Saving-Investment Data?", *Journal of International Money and Finance*, 23, 113-131.
- Ikeda, S. and Gombi, I. (1998) "Habits, Costly Investment and Current Account Dynamics", *Journal of International Economics*, 49, 363-384.
- İşcan, T. B. (2000) "The Terms of Trade, Productivity Growth and the Current Account", *Journal of Monetary Economics*, 45, 587-611.
- İşcan, T. B. (2002) "Present Value Test of the Current Account with Durables Consumption", *Journal of International Money and Finance*, 21, 385-412.
- Jansen, W. J. (1997) "Can the Intertemporal Budget Constraint Explain the Feldstein Horioka Puzzle?", *Economics Letters*, 56, 77-83.
- Jansen, W. J. (2000) "International Capital Mobility: Evidence from Panel Data", *Journal of International Money and Finance*, 19, 507-511.
- Karayalçın, C. (1994) "Adjustment Costs in Investment, Time-Preferences and the Current Account", *Journal of International Economics*, 37, 81-95.
- Kasa, K. (2003) "Testing Present Value Models of the Current Account: A Cautionary Note", *Journal of International Money and Finance*, 22, 557-569.
- Kaufmann, D., Kraay, A. and Zoido-Lobaton, P. (2002) "Governance Matters II: Updated Indicators for 2000/01", World Bank Policy Research Department Working Paper No.2772.

- Kaufmann, D., Kraay, A. and Zoido-Lobaton, P. (2004) "Governance Matters III: Governance Indicators for 1996, 1998, 2000 and 2002", *World Bank Economic Review*, 18(2), 253-287.
- Keynes, J. M. (1960), *The General Theory of Employment, Interest and Money*, McMillan, London.
- Khan, M. S. and Knight, M. D. (1983) "Determinants of Current Account Balances of Non-Oil Developing Countries in the 1970s", *IMF Staff Papers*, 30, 819-842.
- Kim, K., Hall, V. B. and Buckle, R. A. (2001) "New Zealand's Current Account Deficit: Analysis based on the Intertemporal Optimization Approach", New Zealand Treasury Working Paper 01/02.
- Kim, S. H., (2001) "The Saving Investment Correlation Puzzle is Still a Puzzle", *Journal of International Money and Finance*, 20, 1017-1034.
- Knight, M. and Scacciavillani, F. (1998) "Current Accounts: What is Their Relevance for Economic Policymaking?", IMF Working Paper 98/71.
- Kraay, A. and Ventura, J. (2000) "Current Accounts in Debtor and Creditor Countries", *Quarterly Journal of Economics*, 115, 1137-1166.
- Kraay, A. and Ventura, J. (2002) "Current Accounts in the Long and Short Run", NBER Working Papers, No.9030.
- Krol, R. (1996) "International Capital Mobility: Evidence from Panel Data", *Journal of International Money and Finance*, 15(3), 467-474.
- Lane, P. R. and Milesi-Ferretti, G. M. (2003) "International Financial Integration" IMF Staff Papers, 50 (Special Issue), 82-113.
- Laursen, S. and Metzler, L. A. (1950) "Flexible Exchange Rates and the Theory of Employment", *Review of Economics and Statistics*, 32, 281-99.
- Leiderman, L. and Razin, A. (1991) "Determinants of External Imbalances: The Role of Taxes, Government Spending and Productivity" NBER Working Papers, No.3738.
- Levy, D. (2003) "Is the Feldstein Horioka Puzzle Really a Puzzle?", in: G. Agiomirgianakis, T. Biswas, J. Coakley and C. Tsoukis (eds.) *Advances in International Economics and Finance*, Kluwer Academic Publishers, London.
- Lewis, K. K. (1999) "Trying to Explain Home Bias In Equities and Consumption", *Journal of Economic Literature*, 37(2), 571-608.
- Lucas, R. E. (1976) "Econometric Policy Evaluation: A Critique", *Carnegie-Rochester Conference Series on Public Policy*, 1, 19-46.

- Martin, P. and Rey, H. (2004) "Financial Super-Markets: Size Matters for Asset Trade", *Journal of International Economics*", forthcoming.
- Matsuyama, K. (1987) "Current Account Dynamics in a Finite Horizon Model", *Journal of International Economics*, 23, 299-313.
- Matsuyama, K. (1990) "Residential Investment and the Current Account", *Journal of International Economics*, 28, 137-153.
- Mercereau, B. and Miniane, J. (2004) "Challenging the Empirical Evidence from Present Value Models of the Current Account", IMF Working Paper 04/106.
- Milesi-Ferretti, G. M. and Razin, A. (1998) "Sharp Reductions in Current Account Deficits-An Empirical Analysis", *European Economic Review*, 42, 897-908.
- Miniane, J. (2004) "A New Set of Measures on Capital Account Restrictions", IMF Staff Papers, 51(2).
- Mundell, R. A. (1963) "Capital Mobility and Stabilization Policy under Fixed and Flexible Exchange Rates", *Canadian Journal of Economics and Political Science*, 29, 303-24.
- Nason, J. M. and Rogers, J. H. (2002) "Investment and the Current Account in the Short Run and the Long Run", *Journal of Money Credit and Banking*, 34, 967-986.
- Nason, J. M. and Rogers, J. H. (2003) "The Present Value Model of the Current Account has been Rejected: Round up the Usual Suspects", International Finance Discussion Paper No. 760 (Washington: Board of Governors of the Federal Reserve System).
- Normandin, M. (1999) "Budget Deficit Persistence and the Twin Deficits Hypothesis", *Journal of International Economics*, 49, 171-193.
- Obstfeld, M. (1982) "Aggregate Spending and the Terms of Trade: Is There a Laursen-Metzler Effect?", *Quarterly Journal Of Economics*, 97, 251-270.
- Obstfeld, M. (1986) "Capital Mobility in the World Economy: Theory and Measurement", *Carnegie-Rochester Conference Series on Public Policy*, 31, 1-24.
- Obstfeld, M. and Rogoff, K. (1995) "The Intertemporal Approach to the Current Account", in: Gene Grossman and Kenneth Rogoff (eds.) *Handbook of International Macroeconomics*, MIT Press, Cambridge M.A.
- Obstfeld, M. and Rogoff, K. (1996), *Foundations of International Macroeconomics*, MIT Press, Cambridge MA.

- Obstfeld, M. and Rogoff, K. (2000) "The Six Major Puzzles in International Macroeconomics: Is There a Common Cause?", NBER Working Papers, No.7777.
- Ostry, J. D. (1997) "Current Account Imbalances in ASEAN Countries: Are They a Problem?", IMF Working Paper 97/51.
- Otto, G. (1992) "Testing a Present Value Model of the Current Account: Evidence form US and Canadian Time Series", *Journal of International Money and Finance*, 11, 414-430.
- Otto, G. (2003) "Terms of Trade Shocks and the Balance of Trade: There is a Harberger-Laursen-Metzler Effect", *Journal of International Money and Finance*, 22, 155-184.
- Özmen, E. and Parmaksız, K. (2003a) "Exchange Rate Regimes and the Feldstein-Horioka Puzzle: the French Evidence", *Applied Economics*, 35, 217-222.
- Özmen, E. and Parmaksız, K. (2003b) "Policy Regime Change and the Feldstein-Horioka Puzzle: the UK Evidence", *Journal of Policy Modeling*, 25, 137-149.
- Özmen, E. (2005) "Macroeconomic and Institutional Determinants of Current Account Deficits", *Applied Economics Letters*, 12, 557-560.
- Penati, A. and Dooley, M. (1984) "Current Account Imbalances and Capital Formation in Industrial Countries, 1949-81", *IMF Staff Papers*, 31(1), 1-24.
- Persson, T. and Svensson, L. E. A. (1985) "Current Account Dynamics and the Terms of Trade: Harberger-Laursen-Metzler Two Generations Later", *Journal of Political Economy*, 93(1), 43-65.
- Pesaran, M. H. and Smith, R. (1995) "Estimating Long-Run Relationships from Dynamic Heterogeneous Panels", *Journal of Econometrics*, 68, 79-113.
- Pesaran M. H. (2003) "A Simple Panel Unit Root Test in the Presence of Cross Section Dependence", *Cambridge Working Papers in Economics*, 03/46.
- Piersanti, G. (2000) "Current Account Dynamics and Expected Future Budget Deficits: Some International Evidence", *Journal of International Money and Finance*, 19, 255-271.
- Piersanti, G. (2002) "Expected Future Budget Deficits, the Real Exchange Rate and Current Account Dynamics in a Finite Horizon Model", *Journal of Economics*, 77(1), 1-22.
- Prasad, E., Rogoff, K. Wei, S. J. and Kose M. A. (2004) "Financial Globalization, Growth and Volatility in Developing Countries", NBER Working Papers, No.10942.

- Razin, A. (1993) "The Dynamic, Optimizing Approach to the Current Account: Theory and Evidence", NBER Working Papers, No. 4334.
- Reinhart, C. M. and Rogoff, K. S. (2002) "The Modern History of Exchange Rate Arrangements: A Reinterpretation", NBER Working Papers, No. 8963.
- Reinhart, C. M., Rogoff, K. S. and Savastano, M. A. (2003) "Debt Intolerance", *Brookings Papers on Economic Activity*, 2003(1).
- Reisen, H. (1998) "Sustainable and Excessive Current Account Deficits", *Empirica*, 25, 111-131.
- Rodrik, D. (2000) "Institutions for High-Quality Growth: What They Are and How to Acquire Them", NBER Working Papers, No. 7540.
- Rossini, G. and Zanghieri, P. (2003) "A Simple Test of the Role of Foreign Direct Investment in the Feldstein-Horioka Puzzle", *Applied Economics Letters*, 10, 39-41.
- Sachs, J. (1981), "The Current Account and Macroeconomic Adjustment in the 1970s", *Brookings Papers on Economic Activity*, 1, 201-282.
- Sachsida, A and Caetano, M. A. (2000) "The Feldstein Horioka Puzzle Revisited", *Economics Letters*, 68(1), 85-88.
- Schmidt, M. B., (2001) "Savings and Investment: Some International Perspectives", *Southern Economic Journal*, 68(2), 446-456.
- Senhadji, A. S. (1998) "Dynamics of the Trade Balance and the Terms of Trade in LDCs: The S-Curve", *Journal of International Economics*, 46, 105-131.
- Serven, L. (1999) "Terms of Trade Shocks and Optimal Investment: Another Look at the Laursen Metzler Effect", *Journal of International Money and Finance*, 18, 337-365.
- Sheffrin, S. M. and Woo, W. T. (1990) "Present Value Tests of an Intertemporal Model of the Current Account", *Journal of International Economics*, 29, 237-253.
- Sinn, S. (1992) "Saving Investment Correlations and Capital Mobility: On the Evidence from Annual Data", *Economic Journal*, 102, 1162-1170.
- Strong, N and Xu, X. (2003) "Understanding the Equity Home Bias: Evidence from Survey Data", *Review of Economics and Statistics*, 85(2), 307-312.
- Sinha, D. (2002) "Saving-Investment Relationships for Japan and other Asian Countries", *Japan and the World Economy*, 14, 1-23.
- Svensson, L. E. A. and Razin, A. (1983) "The Terms of Trade and the Current Account: The Harberger-Laursen-Metzler Effect", *Journal of Political Economy*, 91(1), 97-125.

Tamirisa, N. T. (1999) "Exchange and Capital Controls as Barriers to Trade", IMF Staff Papers, 46(1).

Taylor, A. M. (2002) "A Century of Current Account Dynamics", *Journal of International Money and Finance*, 21, 725-748.

Tesar, L. (1991) "Savings, Investment and International Capital Flows", *Journal of International Economics*, 31, 55-88.

Ventura, J. (2003) "Towards a Theory of Current Accounts", *World Economy*, 26, 483-512.

Wong, D. (1990) "What do Saving-Investment Relationship Tell Us about Capital Mobility?", *Journal of International Money and Finance*, 9, 60-74.

## **APPENDICES**

## APPENDIX A

### ***Country List:***

Argentina, Australia, Belgium, Burkina Faso, Bolivia, Brazil, Botswana, Canada, Chile, China, Cote d'Ivoire, Cameroon, Colombia, Costa Rica, Cyprus, Germany, Denmark, Dominican Republic, Algeria, Ecuador, Egypt Arab Rep., Spain, Finland, France, Gabon, United Kingdom, Ghana, Gambia, Greece, Guatemala, Honduras, Haiti, Hungary, India, Ireland, Iran, Israel, Italy, Jamaica, Jordan, Japan, Kenya, Korea, Sri Lanka, Morocco, Madagascar, Mexico, Mali, Malawi, Niger, Nigeria, Netherlands, Norway, New Zealand, Pakistan, Panama, Peru, Philippines, Poland, Portugal, Paraguay, Senegal, El Salvador, Sweden, Syrian Arab Republic, Togo, Thailand, Tunisia, Turkey, Uganda, Uruguay, United States, Venezuela, South Africa, Zambia, Zimbabwe.

### ***Country Classification According to the Income Level (World Bank Classification):***

#### ***High Income Countries:***

Australia, Belgium, Canada, Cyprus, Germany, Denmark, Spain, Finland, France, United Kingdom, Greece, Ireland, Israel, Italy, Japan, Korea, Netherlands, Norway, New Zealand, Portugal, Sweden, United States.

#### ***Upper Middle Income Countries:***

Argentina, Botswana, Chile, Costa Rica, Gabon, Hungary, Mexico, Panama, Poland, Uruguay, Venezuela.

#### ***Lower Middle Income Countries:***

Algeria, Bolivia, Brazil, China, Colombia, Dominican Republic, Ecuador, Egypt, El Salvador, Guatemala, Honduras, Iran, Jamaica, Jordan, Morocco, Peru, Philippines, Paraguay, Sri Lanka, South Africa, Syrian Arab Republic, Thailand, Tunisia, Turkey.

#### ***Low Income Countries:***

Burkina Faso, Cote D'Ivoire, Cameroon, Ghana, Gambia, Haiti, India, Kenya, Madagascar, Mali, Malawi, Niger, Nigeria, Pakistan, Senegal, Togo, Uganda, Zambia, Zimbabwe.

***Country Classification According to the Level of Development (UN Classification):***

***Developed Countries:***

Australia, Belgium, Canada, Cyprus, Germany, Denmark, Spain, Finland, France, United Kingdom, Greece, Ireland, Italy, Japan, Korea, Netherlands, Norway, New Zealand, Portugal, Sweden, United States.

***Developing Countries:***

Algeria, Argentina, Bolivia, Botswana, Brazil, Cameroon, Chile, China, Colombia, Costa Rica, Cote D'Ivoire, Dominican Republic, Ecuador, Egypt, El Salvador, Gabon, Ghana, Guatemala, Honduras, Hungary, India, Iran, Israel, Jamaica, Jordan, Kenya, Mexico, Morocco, Nigeria, Pakistan, Panama, Paraguay, Peru, Philippines, Poland, Senegal, South Africa, Sri Lanka, Syrian Arab Republic, Thailand, Tunisia, Turkey, Uruguay, Venezuela, Zimbabwe.

***Least Developed Countries:***

Burkina Faso, Gambia, Haiti, Madagascar, Mali, Malawi, Niger, Togo, Uganda, Zambia.

***Country Classification According to the Level of Indebtedness: (WB Classification):***

***Not Classified by Indebtedness:***

Australia, Belgium, Canada, Cyprus, Germany, Denmark, Spain, Finland, France, United Kingdom, Greece, Ireland, Israel, Italy, Japan, Korea, Netherlands, Norway, New Zealand, Portugal, Sweden, United States.

***Less Indebted Countries:***

Algeria, Botswana, China, Costa Rica, Dominican Republic, Egypt, Ghana, Guatemala, Haiti, India, Iran, Mali, Mexico, Morocco, Thailand, Senegal, South Africa.

***Moderately Indebted Countries:***

Bolivia, Burkina Faso, Cameroon, Chile, Colombia, El Salvador, Honduras, Hungary, Jamaica, Kenya, Madagascar, Niger, Nigeria, Pakistan, Philippines, Paraguay, Poland, Sri Lanka, Tunisia, Uganda, Venezuela.

***Severely Indebted Countries:***

Argentina, Brazil, Cote D'Ivoire, Ecuador, Gabon, Gambia, Jordan, Malawi, Panama, Peru, Syrian Arab Republic, Togo, Turkey, Uruguay, Zambia, Zimbabwe.

***Regional Classification:***

*Latin American Countries:*

Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Jamaica, Mexico, Panama, Paraguay, Peru, Uruguay, Venezuela.

*Middle East and North African Countries:*

Algeria, Egypt, Iran, Israel, Jordan, Morocco, Syrian Arab Republic, Tunisia, Turkey.

*Transitional Economies:*

Hungary, Poland.

*Sub-Saharan African Countries:*

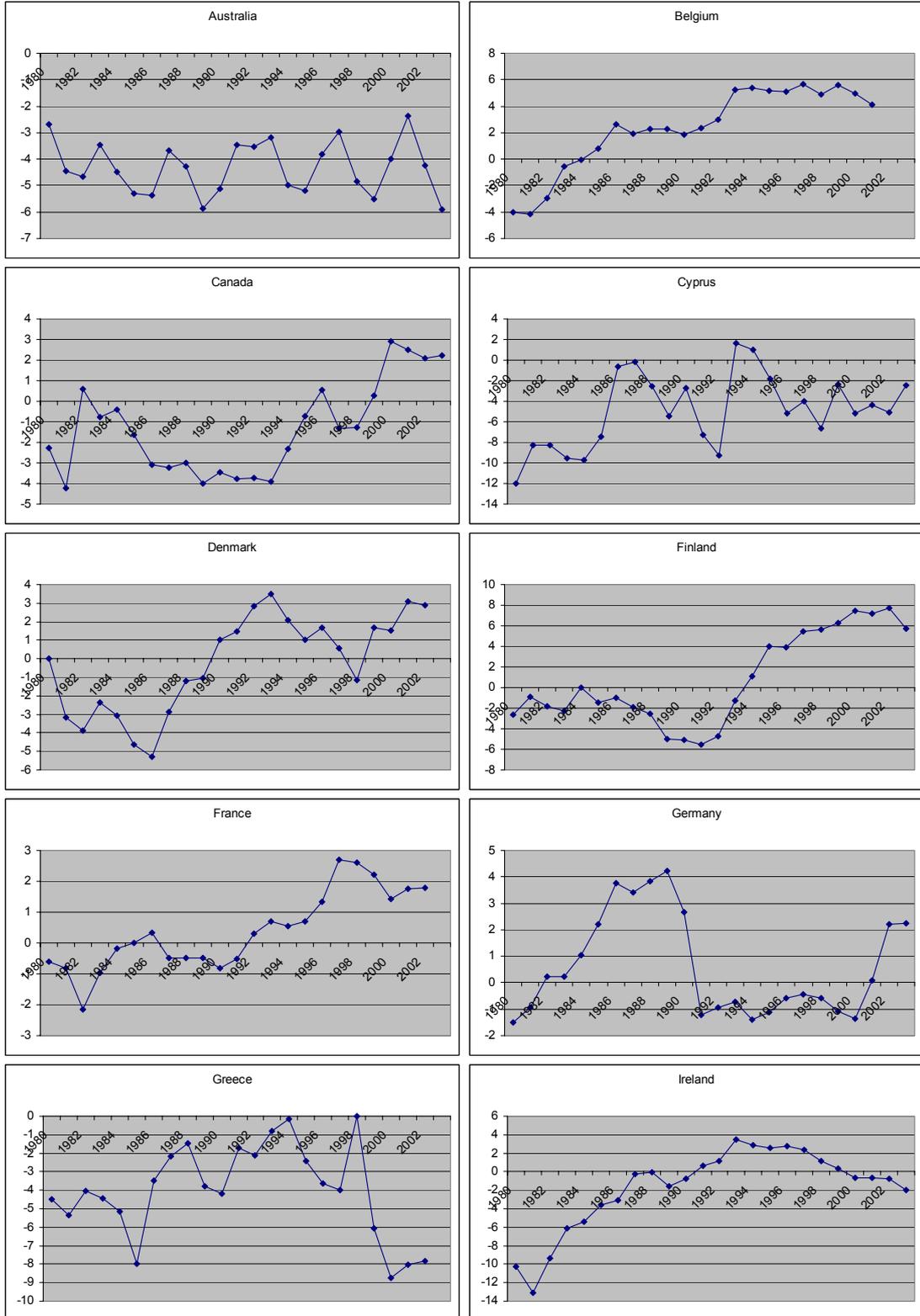
Botswana, Burkina Faso, Cameroon, Cote D'Ivoire, Gabon, Gambia, Ghana, Kenya, Madagascar, Malawi, Mali, Niger, Nigeria, Senegal, South Africa, Togo, Uganda, Zaire, Zimbabwe.

*South and East Asian Countries:*

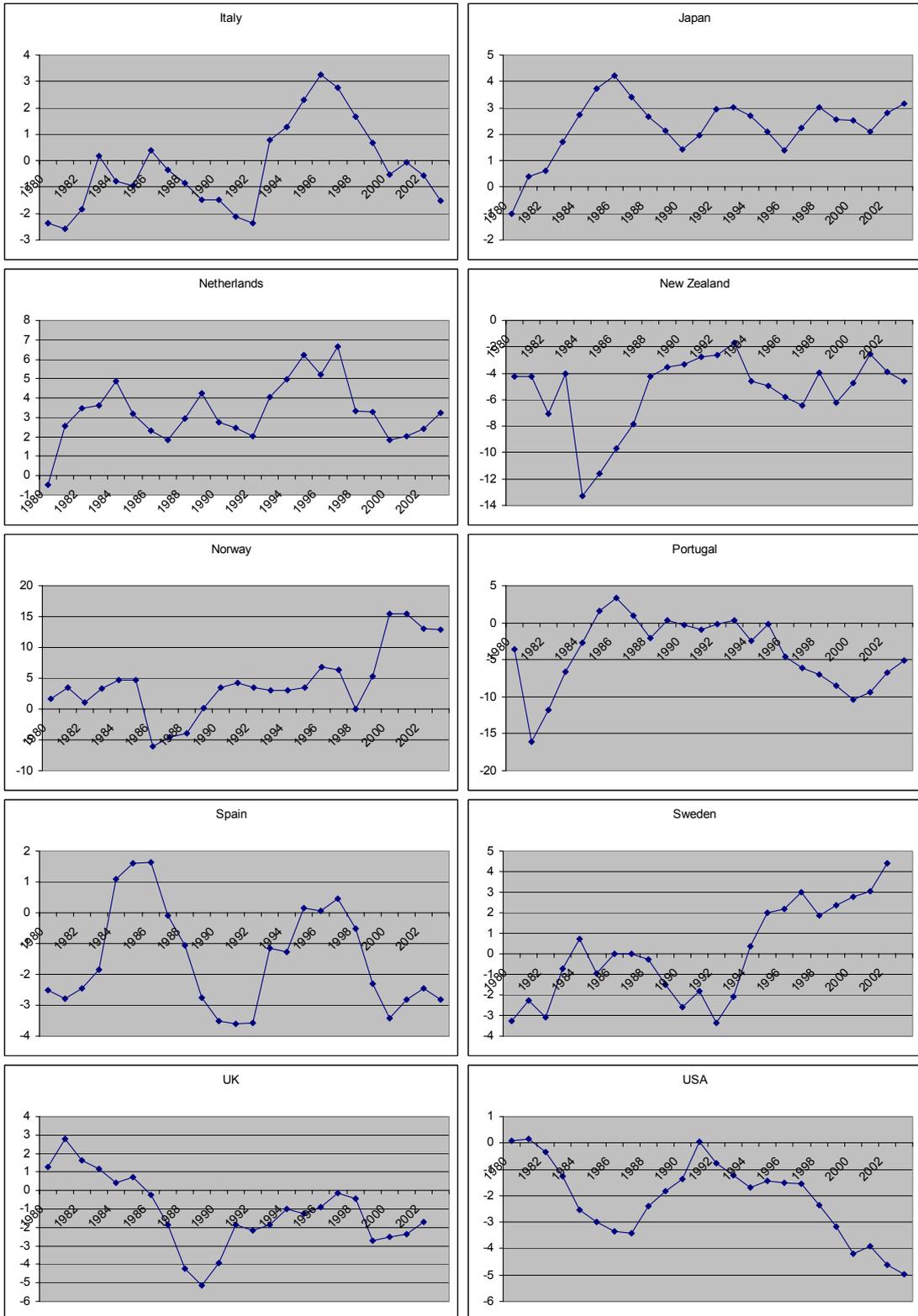
China, India, Korea, Pakistan, Philippines, Sri Lanka, Thailand

## APPENDIX B

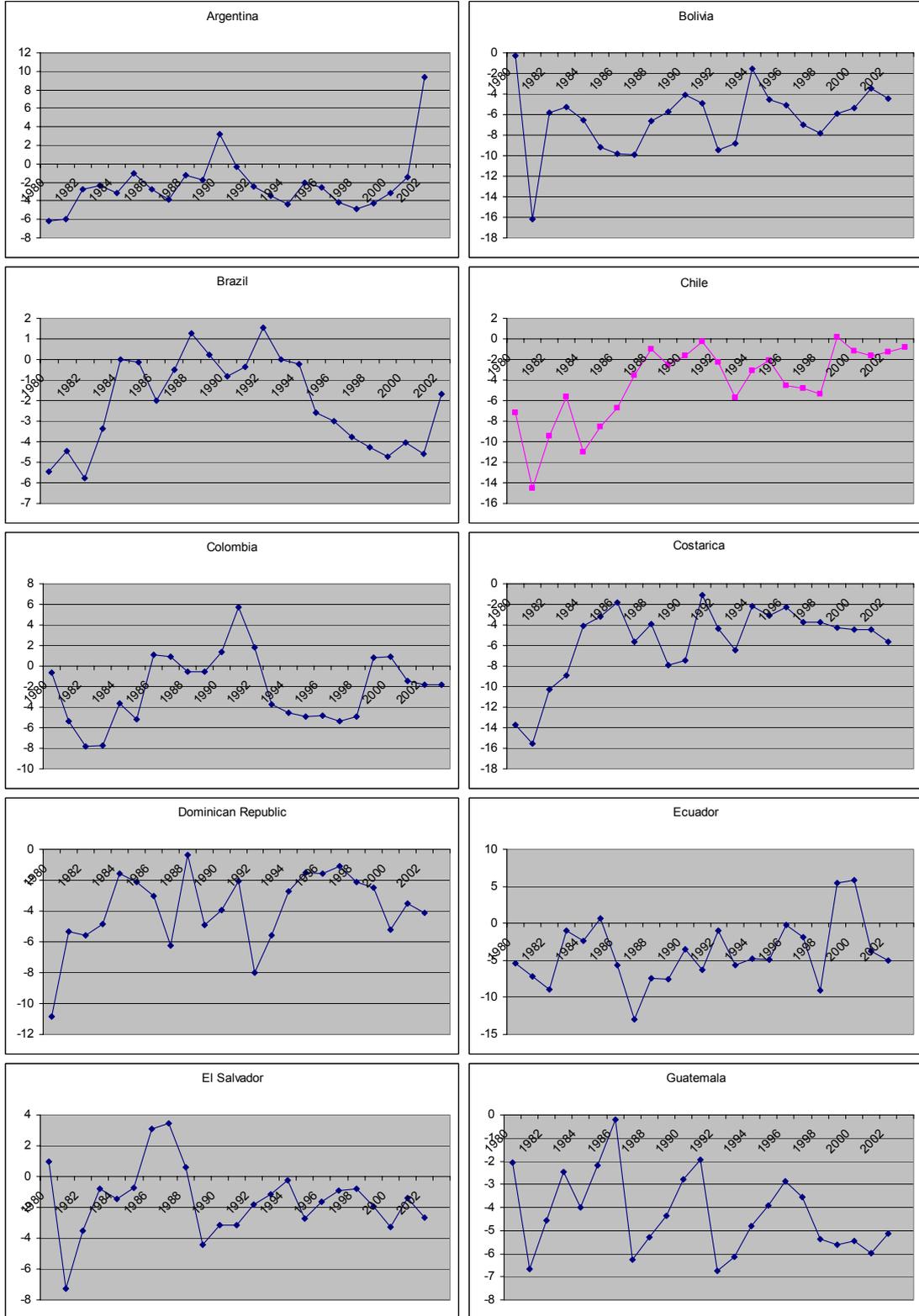
**Figure B1: Current Account Balance as % of GDP (Industrialized Countries)**



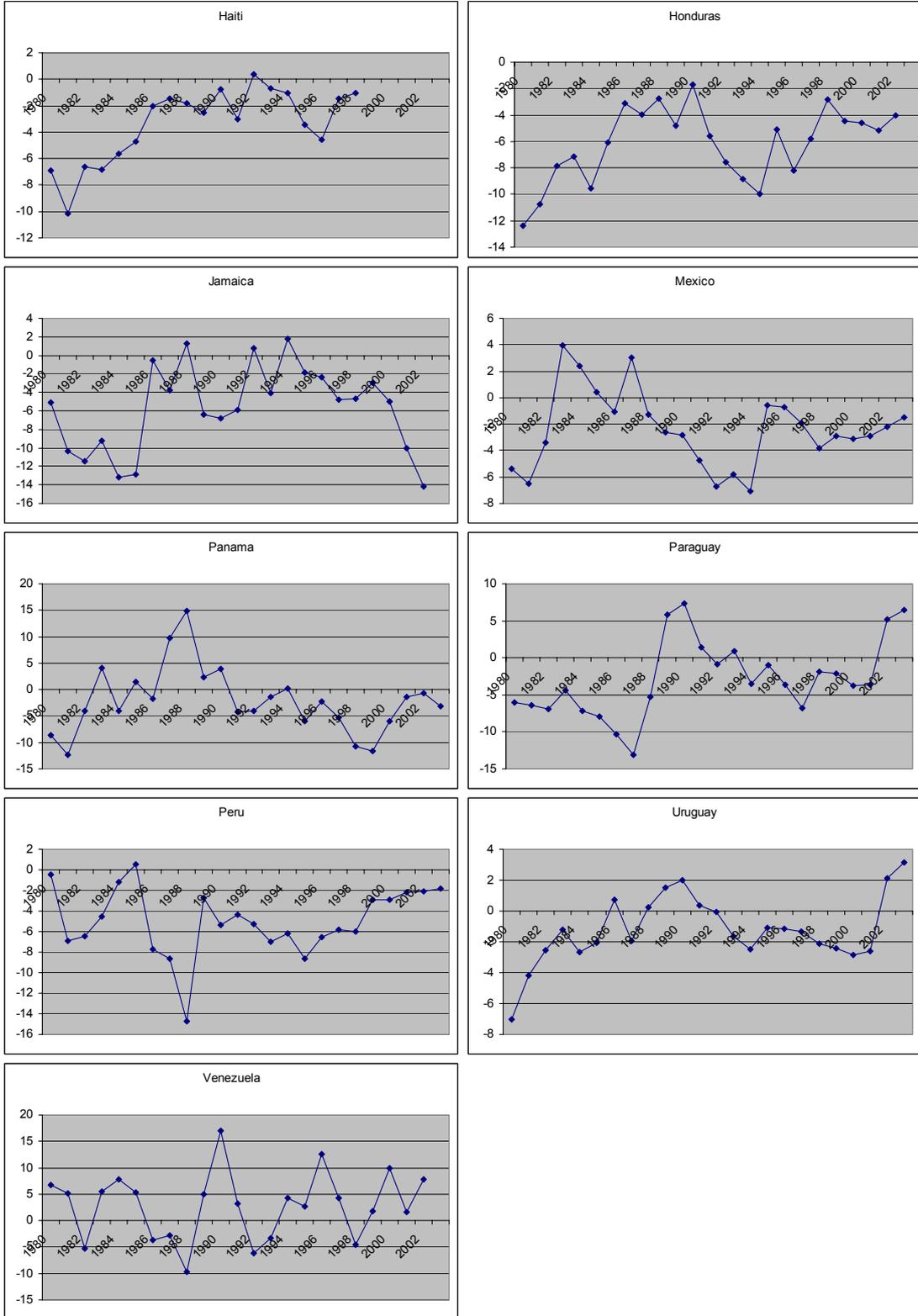
**Figure B1 (continued):**



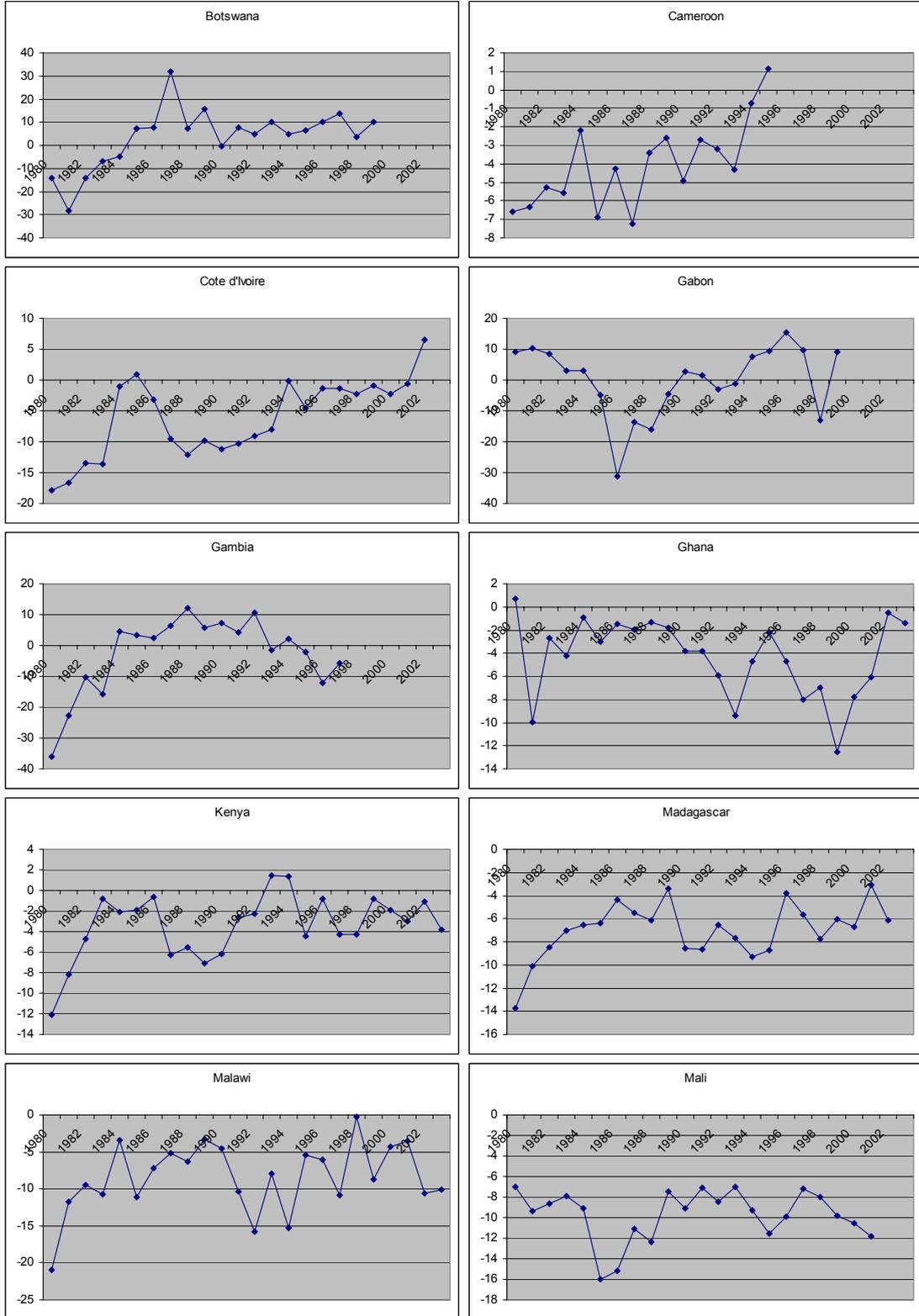
**Figure B2: Current Account Balance as % of GDP (Latin American Countries)**



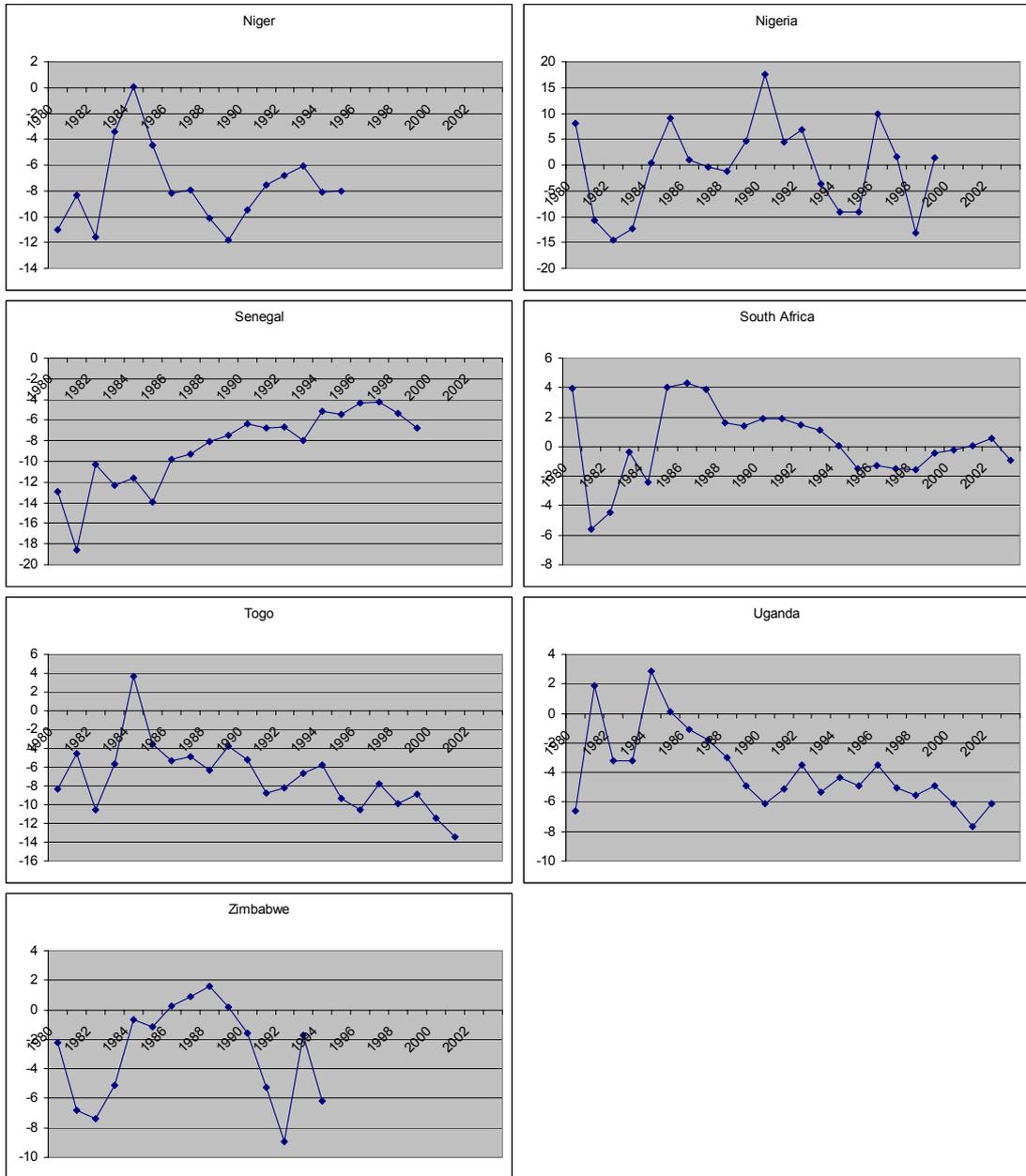
**Figure B2 (continued):**



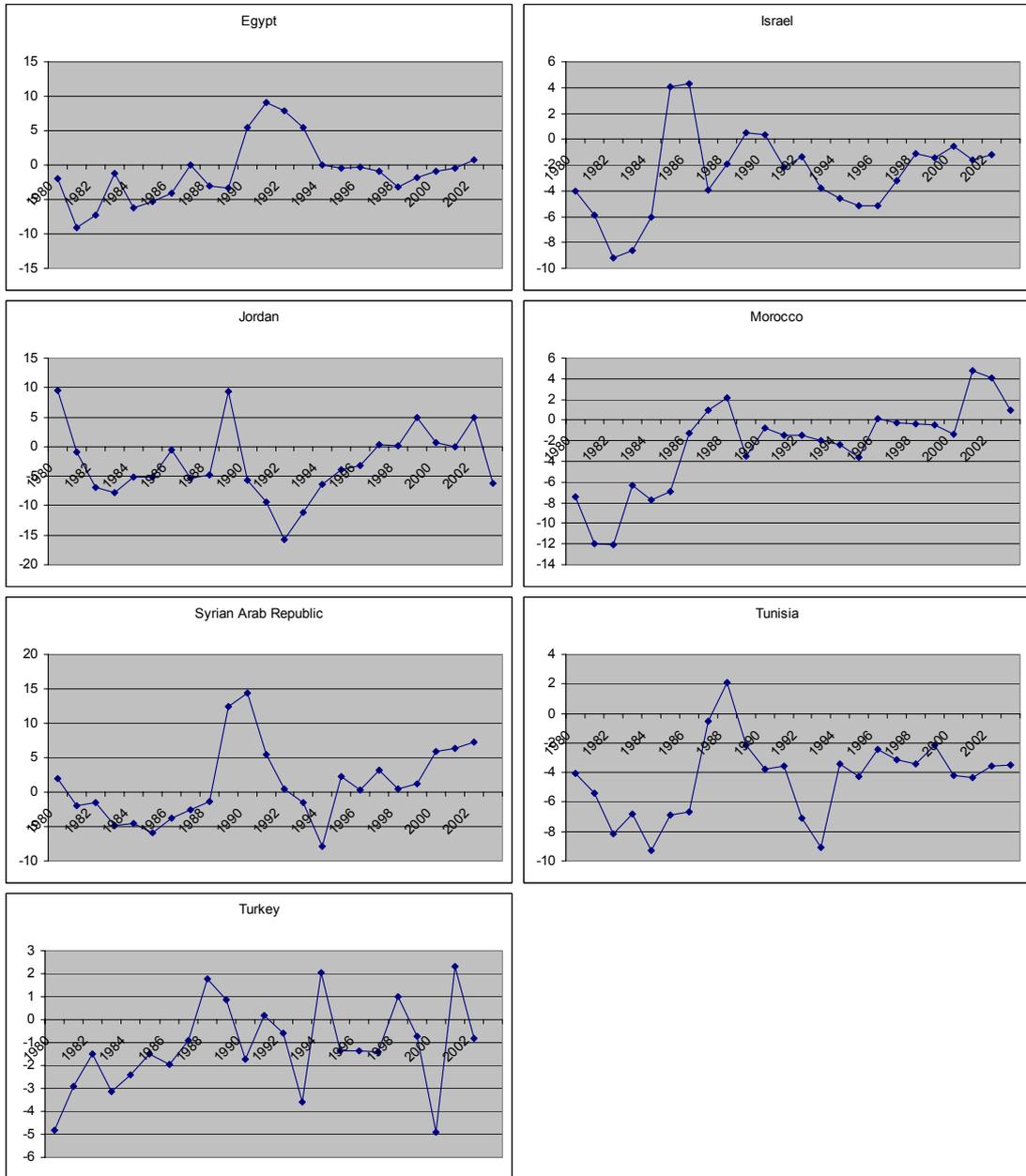
**Figure B3: Current Account Balance as % of GDP (Sub-Saharan Countries)**



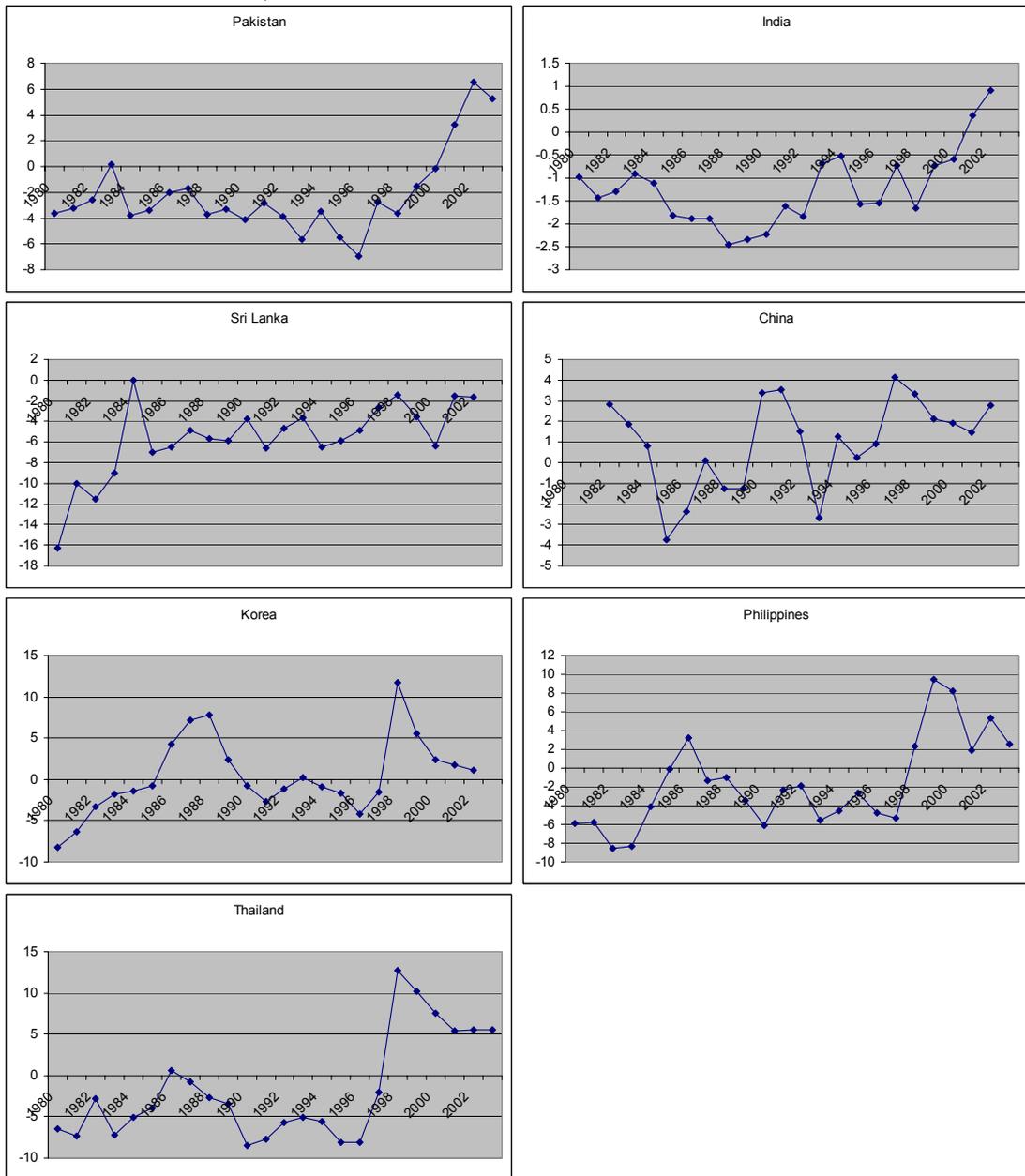
**Figure B3 (continued):**



**Figure B4: Current Account Balance as % of GDP (MENA Countries)**



**Figure B5: Current Account Balance as % of GDP (South and East Asian Countries)**



## APPENDIX C

**Table C.1: Exchange Rate Regime Classifications**

<b>Country</b>	<b>1984</b>	<b>1985</b>	<b>1986</b>	<b>1987</b>	<b>1988</b>	<b>1989</b>	<b>1990</b>	<b>1991</b>	<b>1992</b>	<b>1993</b>	<b>1994</b>	<b>1995</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>
Argentina	14	2	14	14	14	14	14	2	2	2	2	2	2	2	2	2	2	2
Australia	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13
Belgium	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	1	1	1
Burkina Faso	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Bolivia	14	14	14	10	8	8	8	8	7	7	7	7	7	7	7	7	7	7
Brazil	14	14	14	14	14	14	14	14	14	14	14	6	6	6	6	14	12	12
Botswana	8	8	8	7	7	7	7	7	7	7	7	7	7	7	7	8	8	8
Canada	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Chile	12	12	12	12	10	9	9	9	10	10	10	10	10	10	10	9	12	12
China	12	12	12	12	12	12	12	12	12	8	4	4	4	4	4	4	4	4
Cote d'Ivoire	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Cameroon	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Colombia	12	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	12	12
Costa Rica	10	10	10	10	10	10	10	8	8	8	8	8	8	8	8	8	8	8
Cyprus	8	8	8	8	8	8	8	8	4	4	4	4	4	4	4	4	4	4
Germany	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	1	1	1
Denmark	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	4	4	4
Dominican R.	12	14	10	14	14	14	14	14	12	8	8	8	8	8	8	8	8	8
Algeria	10	10	10	10	12	12	12	12	12	12	14	8	8	8	8	8	8	8
Ecuador	12	12	12	14	14	14	14	14	14	14	10	10	10	8	14	14	1	1
Egypt	10	10	10	10	10	10	10	10	4	4	4	4	4	4	4	4	4	4
Spain	8	8	8	8	8	8	8	8	8	8	4	4	4	4	4	1	1	1
Finland	8	8	8	8	8	8	8	8	8	8	8	4	4	4	4	1	1	1
France	7	7	7	4	4	4	4	4	4	4	4	4	4	4	4	1	1	1
Gabon	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
UK	12	12	12	12	12	12	12	3	3	12	12	12	12	12	12	12	12	12
Ghana	13	13	14	14	13	13	14	12	12	12	14	14	14	12	12	12	14	12
Gambia	15	15	14	13	13	13	13	13	8	8	8	8	8	8	8	8	8	8
Greece	12	8	8	8	8	8	4	4	4	4	4	4	4	4	4	1	1	1
Guatemala	2	14	14	12	12	14	14	7	7	7	7	7	7	7	7	7	7	7
Honduras	2	10	10	10	10	10	14	10	10	10	10	10	10	10	10	7	7	7

**Table C.1 (Continued)**

Country	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Haiti	2	8	8	8	8	10	10	10	10	14	14	13	13	13	13	13	13	13
Hungary	10	10	10	10	10	10	10	10	10	10	8	8	8	8	8	9	9	9
India	8	8	8	8	8	8	7	7	4	4	4	7	7	7	7	7	7	7
Ireland	8	8	8	8	8	8	8	8	8	8	8	8	8	4	4	1	1	1
Iran	12	12	12	12	12	12	12	12	12	12	14	14	12	12	12	12	12	12
Israel	14	14	6	8	8	9	8	10	10	10	10	10	10	10	10	10	10	10
Italy	8	8	8	8	8	8	8	8	8	8	8	8	7	4	4	1	1	1
Jamaica	8	8	8	8	8	8	2	14	14	10	8	8	8	7	7	7	7	7
Jordan	2	2	2	2	2	10	10	10	10	7	7	7	4	4	4	4	4	4
Japan	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13
Kenya	2	2	2	12	12	12	12	12	14	14	12	12	12	12	12	12	12	12
Korea, Rep.	7	7	7	7	7	7	6	6	6	6	6	7	7	7	14	13	13	13
Sri Lanka	7	7	7	7	7	7	2	7	7	7	7	6	6	6	6	6	10	10
Morocco	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Madagascar	8	12	12	12	12	12	12	12	12	12	14	14	13	13	13	13	13	13
Mexico	14	14	14	14	14	5	5	5	4	4	9	14	12	12	12	12	12	12
Mali	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Malawi	13	13	13	13	13	13	13	13	13	13	14	2	2	2	14	14	12	12
Niger	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Nigeria	14	12	12	13	13	13	12	14	14	14	14	14	12	12	12	12	12	12
Netherlands	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	1	1	1
Norway	12	12	12	12	11	11	11	11	11	12	12	12	12	12	12	12	12	12
New Zealand	8	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Pakistan	8	8	8	8	8	8	7	8	8	8	7	7	7	7	7	7	7	8
Panama	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Peru	14	14	14	14	14	14	14	14	14	14	8	8	8	8	8	4	4	4
Philippines	14	7	7	7	7	7	7	7	8	10	10	10	4	4	12	12	12	12
Poland					14	14	2	14	14	15	15	10	10	10	10	10	12	12
Portugal	8	8	8	8	8	8	8	8	8	7	4	4	4	4	4	1	1	1
Paraguay	12	14	10	10	10	14	14	7	7	7	7	7	7	7	7	10	10	10

**Table C.1 (Continued)**

Country	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Senegal	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
El Salvador	12	12	12	12	12	12	4	4	4	4	4	4	4	4	4	4	4	2
Sweden	8	8	8	8	8	8	8	8	8	12	12	12	12	12	12	12	12	12
Syria	12	12	12	12	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Togo	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Thailand	4	4	4	4	4	4	4	4	4	4	4	4	4	14	12	12	12	12
Tunisia	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Turkey	14	14	14	14	14	14	14	14	14	14	14	14	14	14	10	10	10	14
Uganda	14	14	14	2	2	2	14	14	14	10	10	10	10	10	10	10	10	10
Uruguay	14	14	14	14	14	14	14	6	14	14	14	14	8	8	8	8	8	8
USA	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13
Venezuela	12	12	12	14	14	14	12	12	12	14	14	14	14	6	6	6	6	6
South Africa	12	12	15	15	15	15	15	15	15	15	15	13	13	13	13	13	13	13
Zambia		14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14
Zimbabwe	12	12	12	12	12	12	12	14	14	14	14	12	12	12	14	2	2	7

## APPENDIX D

### TURKISH SUMMARY

Son yirmi yıldır dünya ekonomisi artan sermaye ve mal akımları hareketliliğinin yol açtığı makroekonomik şoklara daha açık bir hale gelmiştir. Bu çerçevede devletler makroekonomik kararlar alırken veya yeni makroekonomik programları uygulamaya koyarken yeni politika araçları ve yeni politika göstergeleri üretmek zorunluluğuyla karşılaşmışlardır. Bu noktada ülkelerin cari işlemler performansı önemli bir makroekonomik gösterge haline gelmiş ve özellikle gelişmekte olan ülkeler açısından artan cari işlemler açığı ciddi tehlike sinyali olarak algılanmaya başlamıştır. Ulusal makroekonomik şoklar mal ve sermaye akımları tarafından diğer ülkelere kolayca iletilebilir duruma gelmiş ve bu geçişkenlik, birbirleriyle bağlantılı olarak sermaye işlemleri ve cari işlemler hesaplarındaki serbestleştirme programlarını daha sık tartışılır hale getirmiştir. Bu açıdan bakıldığında sermaye hareketleri ülkelerin cari işlemler performansları üzerinde önemli bir etkiye sahip olmuştur.

Önemli bir makroekonomik gösterge olmasından dolayı cari işlemler dengesi iktisat literatüründe giderek daha fazla ilgi çekmeye başlamıştır. Ancak bütün bu ilgiye rağmen hala cari işlemler performansının belirleyenleri konusunda yeterli sayıda çalışma yoktur. Çalışmaların pek çoğu teorik düzeyde kalmaktadır. Cari işlemler açığının belirleyenleri konusundaki bilinen çalışmalar şunlardır: Debelle ve Faruquee (1996), Calderon et al. (2002), ve Chinn ve Prasad (2003).

Bu çalışmanın temel amacı 76 ülkeyi ve 1984-2001 dönemini kapsayan bir panel veri setini kullanarak cari işlemler açığının belirleyenlerini analiz etmektir. Bu veri seti yukarıda bahsedilen üç çalışmada genel olarak kullanılan ticaret hadleri (TOT), reel döviz kuru (RER), sermaye hareketleri kontrol endeksi (CAPCON), dış ticarete açıklık

endeksi (OPENNESS), ülkenin iktisadi büyüklüğü (GDP), finansal derinlik endeksi (FINDEV) gibi değişkenleri içermektedir. Ancak bunların ötesinde bu çalışma yukarıdaki çalışmalardan farklı olarak iki yeni değişkeni veri setine dahil etmiştir. Bu değişkenler sırasıyla yönetim endeksi (ICRG) ve döviz kuru rejimi (MCODE) değişkenleridir. Bu anlamda bu çalışma cari işlemler açığı literatürüne önemli bir katkı yapmayı amaçlamaktadır. Bir ülkenin yönetim (governance) mekanizmasının performansının cari işlemler performansı üzerinde, sermaye hareketleri kanalıyla, önemi bir etkisi olduğu varsayılmaktadır. Yönetişim altyapısı, yani kurumsal ve yönetsimsel gelişmesi üst düzeyde olan ülkelerin daha fazla sermaye akımı çekecekleri ve, dolayısıyla, daha yüksek oranlarda cari işlemler açığını sürdürebilecekleri bu varsayımdan çıkan doğal bir sonuçtur. Diğer taraftan, döviz kuru rejimi esnekleşmesi daha yüksek oranlarda cari işlemler açığını idare edebilmeleri sonucunu doğuracaktır. Bu anlamda her iki değişkenin de cari işlemler performansı üzerinde önemli etkileri olduğu reddedilemez bir gerçektir.

Diğer taraftan cari işlemler hesabı yurtiçi tasarruf ile yurtiçi yatırım arasındaki dengeyle doğrudan ilişkilidir; hatta ulusal gelir muhasebesi açısından cari işlemler hesabı bu ikisi arasındaki farka eşittir. Dolayısıyla, bu ikisi arasındaki korrelatif ilişki cari işlemler dengesini doğrudan ilgilendirir. Neo klasik teori yatırım ile tasarrufun tamamen farklı belirleyenler sahip olduklarını belirtir. Diğer taraftan artan sermaye hareketleri yurtiçi yatırım ile yurtiçi tasarruf arasındaki belirleyici ilişkinin zayıfladığına dair tezlerde giderek önem kazanmaktadır. Her iki teze göre de tasarruf ile yatırım arasındaki korrelasyon katsayısı birin çok altında olmalıdır. Ancak Feldstein ve Horioka'nın 1980 tarihli ampirik çalışması aslında bu ilişkinin sanıldığı kadar düşük olmadığını göstermiştir ve bu durum daha sonra literatürde Feldstein-Horioka paradoksu olarak adlandırılmıştır. Bu yüksek korrelasyon aslında cari işlemler açığının birbirinden ayrı olarak tasarruf ile yatırımdan ziyade tasarruf-yatırım dengesi tarafından belirlendiği şeklinde bir sonuca yol açmaktadır. Bu noktada Feldstein-Horioka paradoksunun ampirik olarak test edilmesi cari işlemler dengesinin belirleyenlerini keşfetmek açısından çok önemlidir. Bu çalışmanın bir diğer amacı da bu paradoksu yukarıda bahsedilen veri seti dahilinde test etmektir.

Bu çalışmanın yapısı şöyledir: İkinci bölümde cari işlemler dengesiyle ilgili temel tanımlamalar verilmiştir. Bu tanımlamalar aslında cari işlemler dengesinin yatırım-tasarruf dengesiyle ve sermaye işlemleri dengesiyle ilişkilerini göstermesi açısından gereklidir. Sermaye işlemlerinin artışı ve küresel sermaye akışının artışı aslında tek tek ülkelerin cari işlemler açığını daha kolay finanse edebilmeleri açısından önemlidir. Bu açıdan ikinci bölüm ayrıca küresel sermaye akımlarının 20.Yüzyıldaki gelişiminin kısa bir tarihçesini de vermektedir. Üçüncü bölüm cari işlemler açığının belirleyenleriyle ilgili teorik ve ampirik çalışmalar üzerinde durmaktadır. Bu bölümde sırasıyla neo klasik modeller (deterministik ve deterministik olmayan modeller) ve keynesyen modeller özetlenecektir. Daha sonra ise az sayıdaki ampirik çalışmalar özetlenecektir. Dördüncü bölüm bu çalışmada kullanacağımız değişkenlerin istatistiksel özellikleri ele alınmıştır. Daha sonra kullanılan veri seti ve metodoloji üzerinde durulacaktır. Biz bu çalışmada cari işlemler açığının belirleyenlerini araştırırken Arellano-Bond dinamik panel veri seti hesaplama yöntemini kullandık. Bir sonraki bölümde cari işlemler açığının belirleyenleri ile ilgili hesaplamaların sonuçları verildi ve bunlar yorumlandı. Yedinci bölüm ise Felstein-Horioka paradoksunun ampirik tanıtlanması ile ilgili hesaplamalara ayrılmıştır. Bu bölümde önce paradoksla ilgili literatür özetlenmiş, sonra da kullanılan metodoloji ve hesaplama sonuçları üzerinde durulmuştur. Klasik panel veri seti hesaplamalarının yanında Ortalama Grup (Mean Group) ve Kesitsel Ortalama Grup (Crossectional Mean Group) hesaplama metotları kullanılmıştır.

Veri setinin temel kaynağı Dünya Bankası'na ait World Development Indicators veri setidir. Ancak sermaye kontrolü verisi IMF'nin Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER) adlı süreli yayınından derlenen verilerden hesaplanmıştır. Diğer taraftan, döviz kuru rejimi verisi Reinhart ve Rogoff'un 2004 çalışmasından alınmıştır.

Cari işlemler dengesi (GSYİH'in yüzdesi olarak) değişkeninin istatistiksel özelliklerine bakılırken, genel bir bakışın ardından, ülkeler belirli kriterler göre sınıflandırılmış ve ortak özellikleri ortaya konulmaya çalışılmıştır. Bu sınıflandırma gelişmişlik seviyesine, bölgesel konuma ve borçluluk duruma göre yapılmıştır. Dönem ortalamalarına bakıldığında 1984-2001 dönemi için sanayileşmiş ülkelerin cari işlemler

performansları ülkeden ülkeye değişiklik göstermektedir. Hollanda, Japonya, Belçika ve Fransa gibi bazı ülkeler ortalamada pozitif cari işlemler dengesi verirken, ABD ve Birleşik Krallık'ın da içinde bulunduğu diğer bir grup ülkeler ortalamada açık vermektedirler. Geçiş ekonomilerinin büyük bir çoğunluğu ise (Ukrayna ve Slovenya dışında) ortalamada açık vermektedirler. Venezuela dışındaki Latin Amerika ülkeleri açısından da durum böyledir. Venezuela'yı farklı kılan ise onun bir OPEC üyesi, yani bir petrol ihraç eden ülke olmasıdır. Petrol ihraç eden ülkeler genellikle cari işlemler fazlası vermektedirler. Ayrıca Latin Amerika ülkelerinin bir kısmı 1990'larda yaşadıkları makroekonomik şoklar sonrası cari işlemler fazlası vermişlerdir. Bu durum milli gelir daralmasının cari işlemler dengesi üzerindeki etkisini göstermektedir. Sahra-altı Afrika ülkeleri de genellikle açık vermektedirler (Botswana gibi değerli metallere ve Nijerya gibi petrol ihraç edenler hariç). Aynı durum Asya ve MENA ülkeleri için de geçerlidir. Asya ülkeleri arasında Çin (Güney Kore ile birlikte) ortalamada fazla veren ülkelere biridir. Çin'deki yüksek büyüme oranı yüksek ihracat artışı ile beslendiğinden gelir artışının ithalat artışını besleyen etkisi bile cari işlemler dengesini negatife çevirmeye yetmemiştir.

Bu arada belirtilmesi gereken cari işlemler dengesinin (GSYİH'e oran olarak) ülkeler arasındaki değişiminin yıllar içindeki değişimden daha yüksek olduğudur. Yani aslında ülkelerin cari işlemler dengeleri arasında fark geçici faktörlerden çok yapısal faktörler tarafından belirlenmektedir. Ayrıca birincil metaller ihraç eden ülkelerin cari işlem dengelerinin yıldan yıla değişimleri ihracatları daha endüstriyel bir temele dayanan ülkelerin cari işlem dengelerinin yıllık değişimlerinden daha yüksektir. Bu birincil malların göreceli fiyatlarının daha kolaylıkla değişebilmesinden kaynaklanır.

Yönetişim değişkeni her ülke için 1 ile 100 arasında bir değerdir ve aslında ülkenin kurumsal, politik, ekonomik ve finansal gelişimi tarafından belirlenir. Ülke bu alanlarda ilerleme kaydettikçe bu endeks yükselir. Doğal olarak ortalamada sanayileşmiş ülkelere ait endeksler gelişmekte olan ülkelerin endekslerine göre daha yüksektir. Genel olarak sanayileşmiş ülkeler için endeks 70'in üzerindedir. Ülkeler arasında bir karşılaştırma cari işlemler performansının bu yönetim endeksiyle pozitif bir ilişkiye sahip olduğunu göstermektedir.

Döviz kuru rejimi endeksi ise 1 ile 15 arasında bir değer alır ve bu değer yükseldikçe döviz kuru rejimi daha esnek hale gelir. Döviz kuru rejimi açısından ülkeler oldukça büyük farklılıklar sergilemektedirler ancak zaman içinde döviz kuru rejiminin giderek serbestleştiği gözlemlenmektedir. Diğer taraftan sermaye kontrol endeksi ise 0 ile 1 arasında bir değer almaktadır ve sermaye hareketleri üzerindeki kontroller arttıkça bu endeks büyümektedir. Ayrıca ülkeler arasında bir karşılaştırma gelişmişlik artışının sermaye kontrol endeksinde bir düşüşe yol açtığı izlenimini vermektedir. Ticaret hadleri değişkeni aslında herhangi bir ülke için bütün periyot boyunca değişkenliği en yüksek olan değişkendir. Finansal derinlik değişkeni bankacılık sisteminin o yıl içinde piyasaya sağladığı kredi toplamının GSYİH'e oranıdır ve aslında ülke içindeki finansal olanakların gelişiminin bir göstergesidir. Burada ekonomik gelişmişlik ile finansal derinlik arasında doğrudan bir ilişki gözlemlenmektedir. Bazı sanayileşmiş ülkelerde bu değişken 100'ün üzerindedir. Uluslar arası ticarete açıklık değişkeni ülkenin ihracatı ile ithalatının toplamının GSYİH'na oranıdır ve dolaylı olarak aslında ülkenin uluslar arası ticarete eklenme derecesini göstermektedir. Bu anlamda ülkenin milli gelirinin büyüklüğü açıklık oranının esas belirleyicisidir. Açıklık endeksi konusunda da ülkeler arasında büyük farklılıklar gözlemlenmiştir.

Cari işlemler açığının belirleyenleri konusundaki hesaplamalarda Arellano-Bond dinamik hesaplama metodu kullanılmıştır. Bu yöntemin bize sağladığı avantaj bağımsız ve bağımlı değişkenler arasındaki olası bir içsellik probleminin bu yöntem sayesinde çözülebilmesidir. Ayrıca bu yöntem klasik panel veri seti için baştan konulan katı varsayımlara duyulan ihtiyacın ortadan kalkmasıdır. Bu anlamda bu yöntem oldukça esnektir ve etkindir.

Cari işlemler açığının belirleyenlerine dair hesaplamalarda biz temel olarak bağımsız değişkenler olarak cari işlemler açığı değişkeninin bir dönem önceki değerini (CAD), yönetişim endeksini (ICRG), uluslar arası ticarete açıklık endeksini (OPEN), finansal derinlik değişkenini (FINDEEP), sermaye kontrol endeksini (CAPCON), ülkenin iktisadi büyüklük değişkeninin (GNP), reel döviz kurunu (RER) ve ticaret hadleri endeksini (TOT) kullandık. Bağımlı değişken cari işlemler dengesi açığıdır. Hesaplamaları hem bütün veri seti için hem de bir takım alt veri grupları için yaptık. Burada beklene işaretler şöyledir: Yönetişim performansı arttıkça ülkelerin daha yüksek

cari işlemler açıklarını kaldıracabilecekleri varsayımından dolayı bu değişkenin katsayısının pozitif olmasını bekleriz. Diğer taraftan, uluslar arası ticarete açıklığın cari işlemler açığı üzerine etkisinin ne olacağı belirsizdir. Finansal derinliğin artışı borçlanma kısıtlarını ortadan kaldırdığından bu değişkenin parametresinin de pozitif olmasını bekleriz. Sermaye kontrollerinin artışı sermaye akımlarını caydıracağından ilişkinin negatif olacağı beklenmektedir. Reel döviz kuru artışı cari işlemler açığını küçülteceğinden RER değişkenini için de negatif bir katsayı beklenir. Döviz kuru rejiminin esnekleşmesinin ülkelere cari işlemler açığını daha kolay indirebilecekleri bir ortam yaratmasından dolayı onun katsayısının da negatif olmasını bekleriz. Son olarak ülkenin iktisadi büyüklüğünü belirten değişkenin artışı cari işlemler açığını körükleyici bir etkiye sahip olacağından onun katsayısının pozitif olması gerekir. Ticaret hadlerinin kötüleşmesi cari işlemler açığını büyüteceğinden onun katsayısının negatif olması gerekir. Bütün bu değişkenler için (TOT hariç) ülkeler ararsındaki varyans, zaman içindeki varyanstan yüksektir.

Bütün veri seti için yapılan hesaplamada sermaye kontrol endeksi değişkeni hariç bütün değişkenlerin katsayıları anlamlı çıkmıştır ve anlamlı katsayıların işaretleri beklenen yöndedir. Burada cari işlemler açığının bir önceki döneminin katsayısı anlamlı ve 0.5 'den küçüktür. Bu cari işlemler açığını vuran geçici şokların yarı ömürlerinin bir yıldan az olduğunu gösterir. Diğer taraftan bizim çalışmamızın yeniliği olan iki değişkenin, yani yönetim endeksinin (ICRG) ve döviz kuru rejimi endeksi (MCODE) değişkenlerinin katsayıları anlamlı ve beklenen yönde hesaplanmışlardır. Yönetişim endeksinin katsayısı pozitif, döviz kuru endeksininki ise negatiftir. Öte yandan uluslar arası ticarete açıklık değişkeninin katsayısı negatiftir; yani bu hesaplama göre ülkelerin uluslar arası ticarete eklenme dereceleri arttıkça cari işlem açıkları düşmektedir. Diğer bir deyişle, uluslar arası ticaret olanakları arttıkça ülkelerin ihracat olanakları artmakta ve dolayısıyla cari işlemler açığı düşmektedir.

Sanayileşmiş ülkeler için yapılan hesaplamada ise yönetim endeksi, döviz kuru rejimi değişkeni, reel döviz kuru, sermaye kontrol endeksi ve ülke büyüklüğü değişkenlerinin katsayıları anlamsız çıktılar. Cari işlemler açığının bir önceki dönem değeri, ticaret hadleri endeksi, finansal derinlik ve açıklık değişkenleri anlamlı ve işaretleri beklenen yönde çıktı. Geçici şokların yarı ömrü sanayileşmiş ülkeler için de bir

yıldan küçük olarak hesaplandı. En az gelişmiş ülkeler hariç, gelişmekte olan ülkeler için yapılan hesaplamalarda döviz kuru rejimi dışındaki bütün değişkenlerin katsayıları anlamlı ve beklenen yönde bulundular. Hatta sermaye kontrol indeksinin katsayısı anlamlı ve negatif bulundu. Diğer taraftan bütün gelişmekte olan ülkeler için yapılan hesaplamaların sonuçlarına göre döviz kuru rejimi, sermaye kontrol endeksi ve uluslar arası ticarete açıklık endeksi hariç bütün değişkenlerin katsayıları anlamlı ve beklenen yönde bulundular. Sahra altı Afrika ülkeleri hariç, bütün veri seti için yapılan hesaplama aslında bütün veri seti için yapılan hesaplama ile neredeyse aynı sonuçları verdi; sermaye kontrol endeksi hariç, bütün değişkenlerin katsayıları anlamlı ve beklene işaretlerde bulundu. Arıca bütün bu alt gruplar için cari işlemler hesabını vuran geçici şokların yarı ömrü bir yıldan azdır.

Bu hesaplamalara ek olarak bütün veri seti için bazı ek değişkenleri koyarak elde edilen genişletilmiş modeller hesaplandı. Her defasında bir ek değişkeni ekleyerek dört farklı modeli hesapladık. İlk modelde, ünlü ikiz açık (twin deficit) hipotezinin geçerliliğini test etmek için modele bütçe dengesi değişkenini ekleyerek hesapladık. Bütçe değişkeninin katsayısı anlamlı ve negatif bulundu. Bu sonuç, ikiz açık hipotezini destekler mahiyettedir. İkinci modelde enflasyon oranını ek değişken olarak koyduk ve katsayısının anlamlı olduğu halde sıfıra çok yakın bir değer olduğunu gördük. Üçüncü modelde ise ek değişken olarak hükümet harcamalarını kullandık. Bu değişkenin katsayısı pozitif ve anlamlı çıktı. Son olarak, ülkenin ekonomik büyüklüğü ABD'nin ekonomik büyüklüğüne bölündü ve yeni bir ekonomik büyüklük oranı elde edildi. Bunun dahil edildiği modelde bu değişkenin katsayısı anlamlı çıkmadı.

Cari işlemler dengesi aslında, belirtildiği gibi, ulusal gelir muhasebesi perspektifinden, yurtiçi tasarruf ile yurtiçi yatırım arasındaki dengeyi de gösterir. Bu anlamda ünlü Feldstein-Horioka paradoksunun ne ölçüde geçerli olduğu cari işlemler dengesinin belirlenmesi açısından önemlidir. Tamamen kapalı bir ekonomide yurtiçi yatırım yurtiçi tasarruf tarafından belirlenir, dolayısıyla yurtiçi tasarruf miktarı yatırımlar açısından bir kısıttır. Ancak sermaye hareketlerinin serbestleştirilmesiyle birlikte yurtiçi yatırımın yabancı tasarruf tarafından da finanse edilebilmesinin yolu açılmış olur. Dolayısıyla tamamen kapalı ekonomiden sermaye hareketleri hesabı serbestleştirilmiş bir ekonomiye geçişte yurtiçi yatırım ile yurtiçi tasarruf arasındaki

ilişki giderek zayıflar. Böylece yurtiçi yatırım ile yurtiçi tasarruf arasındaki korrelasyonun birin çok altına inmesi beklenir ama Feldstein ile Horioka'nın hesaplamaları bunun böyle olmadığını göstermiştir. Yurtiçi yatırım- tasarruf dengesi, ve dolayısıyla cari işlemler hesabı açısından, bu korrelasyon çok önemlidir. Eğer bu korrelasyon yüksek ise (neo klasik teorinin beklentilerinin aksine) tasarruf artışı yatırımı da arttıracığından cari işlem dengesindeki değişimin, tasarruftaki değişime oranı birden küçük olacaktır. Dolayısıyla bu paradoksun ampirik olarak tanıtılması cari işlemler dengesi açısından da önemlidir.

Bu ampirik araştırma için yine 76 ülkeyi ve 1984-2001 periyodunu kapsayan bir veri seti kullanılmıştır ve bu veri seti de Dünya Bankası'nın World Development Indicators veri tabanından derlenmiştir. Verilerin istatistiki analizi yurtiçi tasarruf ile yurtiçi yatırım arasındaki anlamlı pozitif ilişkiyi her boyutuyla doğrular gibi görünmektedir. Diğer taraftan cari işlemler dengesinin tek tek yurtiçi tasarruf oranı ve yurtiçi yatırım oranı ile doğrudan birilişkisini verilerin yayılımından çıkarmak çok zor gibi görünüyor.

Hesaplama kısmında önce cari işlemler açığını yurtiçi yatırım ile açıklayan model, sonra yine cari işlemler dengesini yurtiçi tasarruf ile açıklayan model üzerine ve en son yatırım oranını tasarruf oranı ile açıklayan modeller tahmin edilmiştir. Her model üç boyutlu (Pooled, within ve between) olarak tahmin edilmiştir. İlk modelin tahmini yatırım oranının katsayısını üç boyuta göre sırasıyla -0.36, -0.452 ve 0.225 olarak vermiştir. Burada göze çarpan şey, üçüncü boyutta tahmin edilen katsayının pozitif oluşudur. Bu yüksek yatırım oranına sahip ülkelerin aslında genel olarak cari işlemler fazlası veren ülkeler olduğudur. Diğer taraftan sanayileşmiş ve gelişmekte olan ülkeler için ayrı ayrı yapılan tahminler de aynı sonuçları vermişlerdir. Yalnız, sanayileşmiş ülkeler açısından ilk iki boyutta tahmin edilen katsayılar görece yüksek iken üçüncü boyutta tahmin edilen bir hayli düşüktür.

## CURRICULUM VITAE

### PERSONAL INFORMATION

Surname, Name: Kaya-Bahçe, Seçil Aysed  
Nationality: Turkish (TC)  
Date and Place of Birth: 16 July 1975 , Balıkesir  
Phone: +90 312 240 46 02  
email: aysedk@metu.edu.tr

### EDUCATION

Degree	Institution	Year of Graduation
PhD	METU Department of Economics	2005
MS	METU Department of Economics	2001
BS	METU Department of Economics	1998
High School	Ankara Science School	1993

### WORK EXPERIENCE

Year	Place	Enrollment
1998-2005	METU Department of Economics	Research Assistant

### FOREIGN LANGUAGES

Advanced English, Intermediate French

### WORKING PAPERS

Kaya, S. A. and Üçdoğruk Y. (2002), “The Dynamics of Entry and Exit in Turkish Manufacturing Industry”, METU Department of Economics, ERC Working Paper No. 02/02.

### PRESENTATIONS

2001, “The Elusive Relationship between Income Inequality and Growth”, presented in the *METU Conference on Economics V*, organized by Economic Research Center, METU, Ankara, Turkey, September 10-13, 2001.

2002, “Dynamics of Entry and Exit in Turkish Manufacturing Industry”, presented in the *METU Conference on Economics VI*, organized by Economic Research Center, METU, Ankara, Turkey, September 11-14, 2002.

### COMPUTER SKILLS

Stata, PcGive, Microfit, Eviews