THE POSSIBILITY OF FINANCIAL CRISES IN DEVELOPING COUNTRIES UNDER FLEXIBLE EXCHANGE RATE REGIMES: A MULTIDIMENSIONAL APPROACH

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

BY

MEHMET SELMAN ÇOLAK

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR
THE DEGREE OF MASTER OF SCIENCE
IN THE DEPARTMENT OF
ECONOMICS

SEPTEMBER 2012

Approval of the Graduate School of Social Sciences

_____

(Title and Name)
Director

I certify that this thesis satisfies all the requirements as a thesis for the degree of Master of Science.

_____

Prof.Dr. Erdal Özmen
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 Master of Science.

_____

Assist. Prof. Dr. Hasan Cömert
Supervisor

Examining Committee Members

Assoc. Prof. Dr.Emre Özçelik _____

Assist. Prof. Dr.Hasan Cömert _____

Assist. Prof. Dr.İlhan Can Özen _____

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: Mehmet Selman Çolak

Signature :

ABSTRACT

THE POSSIBILITY OF FINANCIAL CRISES IN DEVELOPING COUNTRIES UNDER FLEXIBLE EXCHANGE RATE REGIMES: A MULTIDIMENSIONAL APPROACH

Çolak, Mehmet Selman
M.S, Department of Economics
Supervisor: Assist. Prof. Dr. Hasan Cömert
September 2012, 175 pages

Many economists and politicians have blamed fixed exchange rate regimes for several crises taking place in developing countries after the 1980s. According to them, since the beginning of the 2000s, widespread implementation of flexible exchange rate regimes and high international reserves have prevented developing countries from experiencing similar catastrophic experiences. This interpretation seems to be misleading. We believe that even flexible exchange rate regimes with high international reserves do not have a magic to prevent a financial crisis. Although flexible exchange rate regimes and high international reserves might have played some positive roles in the relatively calm period of 2001-2008; the main reason behind the calmness of this period is the fact that developing countries did not face a strong financial shock during this period. In the presence of "safe havens", which implies existence of safe developed countries for financial capital to move into, flexible exchange rate regimes and the accumulated large reserves may not be adequate when a wave of financial shocks, as in the form of sudden stops and capital reversals, hit developing countries. Indeed, the absence of safe heavens and very low yields in developed countries eased the pressure on developing countries during the recent financial crisis of 2008-2009. If developed economies get their safe haven status back, developing countries might face new financial shocks. In this sense developing countries would experience new financial crises in this new period. We will elaborate on the possible conditions of these prospective financial crises in this thesis.

Keywords: Exchange rate, Safe haven, Reserves, Financial crisis, Capital flows

ÖZ

DALGALI KUR REJİMİ ALTINDAKİ GELİŞMEKTE OLAN ÜLKELERDE FİNANSAL KRİZ OLASILIĞI: ÇOK BOYUTLU YAKLAŞIM

Çolak, Mehmet Selman
Yüksek Lisans, İktisat Bölümü
Tez Yöneticisi: Yard. Doç. Dr. Hasan Cömert

Ağustos 2012, 175 sayfa

Çok sayıda ekonomist ve politikacı 1980 lerden itibaren kalkınmakta olan ülkeleri vuran finansal krizlerin sebebi olarak sabit kur rejimlerini suçlamaktadırlar. Onlara göre özellikle 2000 li yıllarda yaygın şekilde uygulanan dalgalı kur rejimi ve yüksek miktarda uluslararası rezerv biriktirme politikaları gelişmekte olan ülkelerin 2000'li yıllarda ciddi krizler yaşamasını engellemiştir. Bize göre bu çıkarım bir derece yanıltıcıdır. Dalgalı kur rejimleriyle birlikte uygulanan yüksek rezerv politikası krizleri engellemekte çok olağanüstü rollere sahip değildir. Gelişmekte olan ülkelerin 2001-2008 yılları arasındaki sakin ve krizsiz döneminin esas sebebi bu ülkelerin bu yıllarda ciddi manada finansal şoklar yaşamamış olmalarıdır. Güçlü ve güvenli gelişmiş ülkeler manasına gelen güvenli limanların varlığında, dalgalı kur ve yüksek rezerv politikaları gelişmekte olan ülkelerin ciddi şoklar yaşamasına engel olamazlar. Bununla birlikte, global finansal krizde güvenli limanların yokluğu ve kalkınmış ülkelerdeki çok düşük faiz oranları, krizin gelişmekte olan ülkelere çok ciddi baskılar yapmasını engellemiştir. Fakat eğer kalkınmış ülkeler güvenli liman rollerini tekrar kazanırlarsa, gelişmekte olan ülkeler yeni finansal şoklarla karşılaşabilirler. Bu bağlamda gelişmekte olan ülkeler yeni dönemde ciddi krizler yaşayabilirler. Bu tezde, bu olası krizlerin hangi koşullarda olabileceğini detaylı bir şekilde inceleyeceğiz.

Anahtar kelimeler: Döviz Kuru, Güvenli Liman, Rezervler, Finansal Kriz, Sermaye Hareketi

To the two most precious women in my life;

My mother, **Hatice** *and my sister*, **Halenur**

ACKNOWLEDGEMENTS

I owe a debt of gratitude and appreciation to my thesis supervisor Assist. Prof. Dr. Hasan Cömert for his close supervision, encouragements and brotherly help throughout this thesis. He was so patient when I had difficult times and sometimes he worked harder than me for this thesis. He always encouraged me to do the best and thought about my academic career more than anyone else not only as a supervisor but also as a close friend or brother. I am truly fortunate to have had the opportunity to work with him.

I would like to thank Assoc. Prof. Dr. Emre Özçelik and Assist. Prof. Dr. İlhan Can Özen for their constructive suggestions and valuable comments as the members of the examining committee. They will always be on my mind to get their advice for my future research.

My uncle Numan Bodur has a great place in my life and his both professional and emotional supports have made important contributions to this thesis. My friend Betül Fındık is the one who never hesitates to show her sincere assistance whenever I needed and I would like to apologize to her for stealing her time. Also special thanks to TUBITAK for financially supporting me during my Master study.

Lastly, I am indebted to my family for showing their continuous love, compassion and endless patience to me. Their presence made this thesis worth writing and made this life worth living.

TABLE OF CONTENTS

LIST OF FIGURES

FIGURES

LIST OF TABLES

TABLES

CHAPTER 1

INTRODUCTION

Economics is a social science which incorporates wide ranges of subjects. The concept of "crisis" is one of these subjects which have drawn particular attention of many scholars many decades. In a broad perspective, a crisis may be defined as the periods of downswings occurring in an economy after a period of prosperity and boom. What happens in the downswings, what caused them and what are the solutions are the main concerns of the discussions about "crises". There are extensive literature and theories developed for understanding crises. And as the new episodes of crises have occurred, the discussions and theories about the crises have evolved.

The extensive literature on crises has turned its attention to the concept of "financial crises" since the 1970s. Financial crises may be broadly defined as financial sector failures or currency collapses which have significant impacts on the real side of an economy such as recessions, unemployment or increasing poverty. And this concept has taken great place in the literature since the 1970s due to the frequent collapses taking place in the financial system of developing countries. This thesis aims to contribute to the field by both analyzing the past crises episodes and investigating the conditions which can make prospective crises.

1.1 Contemporary Financial Crises and Exchange Rate Regimes

The examples of contemporary financial crises are the Tequila crisis of Mexico in 1994, the Russian default in 1998, the Turkish banking crisis in 2001 and the Peso crisis of Argentina in 2002. These examples are not enough and in Table 1.1 we can see the financial crises happened in major developing economies since the

1970s. It is clear from the figure that many developing countries experienced financial crises, and in some of them, crises recurred 4-5 times since the 1970s. With the rise of developing country financial crises, the theories on these crises have boomed too. Contemporary literature specifies three generations of financial crises theories, of which the first one starts with the work of Krugman (1979). These three generations have differed in many characteristics from country specific factors to global financial environment at the time of the crises. Nevertheless, all these theories agree on two features which are common to the countries explained in the three generations of crises theories. These are fixed exchange rate regimes and inadequate foreign exchange reserves to defend the regime in the crises-hit countries. In all three generations of crises models, we see that the crises occurred in developing countries using fixed exchange rate regimes and not having sufficient international reserves since the 1970s (Table 1.1). All these three generations models, other contemporary theories by the mainstream economists, even many central bankers and prime ministers have blamed fixed exchange rate regimes for the occurrence of these crises in developing countries. For example, the title of an article published in New York Times in the March 1999 was: "Beware of Fixed Exchange Rates and Currency Pegs" (Roche, 1999) Their claim was that fixed exchange rate regimes invite speculative attacks to the currencies and further they assert that since the inability of developing countries with fixed exchange rate regimes to apply independent monetary policies, weathering these attacks is difficult (Chang & Velasco, 2001; Obstfeld & Rogoff, 1995). Also both overcoming the attacks and ensuring the sustainability of fixed exchange rate require excessive amounts of foreign exchange reserves. Hence these theories accuse developing countries of not accumulating adequate amounts of reserves as well.

Table 1.1: Financial Crises Dates in Major Developing Countries

Country	Crisis dates
Argentina	June 1970 June 1975 February 1981 July 1982 September 1986 April 1989 February 1990 February 2002
Bolivia	November 1982 November 1983 September 1985
Brazil	February 1983 November 1986 July 1989 November 1990 October 1991 January 1999
Chile	December 1971 August 1972 October 1973 December 1974 January 1976 August 1982 September 1984
Colombia	March 1983 February 1985 August 1995 September 1997 September 1998 August 1999
Indonesia	November 1978 April 1983 September 1986 December 1997 January 1998
Malaysia	July 1975 August 1997 June 1998
Mexico	September 1976 February 1982 December 1982 December 1994
Peru	June 1976 October 1987 September 1988
Philippines	February 1970 October 1983 June 1984 February 1986 December 1997
Thailand	November 1978 July 1981 November 1984 July 1997 January 1998 September 1999 July 2000
Turkey	August 1970 January 1980 March 1994 February 2001
Uruguay	December 1971 October 1982
Venezuela	February 1984 December 1986 March 1989 May 1994 December 1995

Source: Kaminsky (2003)

For these reasons, developing economies are advised to implement greater exchange rate flexibility in their foreign exchange policies by the economists. For instance Wyplosz (2008) quotes:

> A key conclusion from the crises was that exchange rate pegging is dangerous when capital controls are removed… A high degree of exchange rate flexibility is required in order to reduce the risk of currency crises (p.4).

After the frequent collapses of developing country financial systems, which increased in the late 1990s, many developing countries seemed to follow the advices of the literature and experienced substantial policy shifts. Most developing countries began to use flexible exchange rate regimes and the central banks in these countries have accumulated large amounts of foreign exchange reserves after the 2000s.

According to the literature and policymakers, since the beginning of the 2000s, widespread implementation of flexible exchange rate regimes and the high international reserves have prevented developing countries from experiencing catastrophic collapses similar to the ones in the 1990s. Furthermore, relatively more moderate performance of developing countries than advanced countries during the global financial crisis in 2007-08 and the past developing country crises of the 1990s have been attributed to the flexible exchange rate regimes and high reserves in developing countries in these years. For example, in 2009, the president of Central Bank of Brazil, Henrique Meirelles (2009), stated in the celebration of 10th anniversary of floating the Brazilian Real:

> The floating exchange rate regime has weathered many storms, starting with the bursting of high tech bubble in 2000, the Argentine crisis in 2001, the September 11th attacks and, recently, the effects of the 2008 global financial crisis… If Brazil had not floated the Real in 1999, it would surely have done so since then, and possibly in more adverse conditions.

Similar remarks were made by the former president of the Turkish central bank, Durmuş Yılmaz (2011). He stated in a conference that Turkey resisted global financial crisis mainly due to the implementation of flexible exchange rate regime. Economists have also discussed that flexible exchange rate regimes and accumulated reserves are significant factors behind the relatively calm and stable years of developing countries in the 2000s. For example, Jeanne (2007) asserts that; "With

international reserves four times as large, in terms of their GDP, as in the early 1990s, emerging market countries seem more protected than ever against shocks to their current and capital accounts" (p.1). Thus, the widespread belief among economists and policymakers is that flexible exchange rate regimes and high accumulated international reserves have been very effective tools in alleviating the financial shocks in emerging markets in the 2000s.

1.2 Motivation and Scope of the Thesis

The widespread argument in favor of flexible exchange rate regimes leads to a belief that flexible exchange rate regimes together with large accumulated reserves are a kind of medicine for developing countries. And the relatively good performances of developing countries in the 2000s, when majority of these countries prevalently implemented flexible exchange rate regimes, strongly support the majority of the literature. For this reason, the literature has paid little attention to the possibility of a financial crisis under flexible exchange rate regimes. There are of course some works claiming that flexible exchange rate regimes could witness financial crises, however; these works lack the sufficient theoretical frameworks explaining on which grounds and policy settings these crises could happen (Arteta, 2005; Bubula & Otker, 2003; Domaç & Martinez - Peria, 2003; Edwards & Savastano, 1999). These studies mainly focus on the comparison of fixed and flexible exchange rate regimes (Magud, 2010; Rogoff, Brooks, Oomes, & Husain, 2003). This work differs from the existing literature by both claiming that there is a possibility of a financial crisis in developing countries under flexible exchange rate regimes with high reserves and manifesting the possible grounds of these prospective crises. All in all, the motivation of this thesis is to close the gap of the existing literature on the prospective financial crises in developing countries under flexible exchange rate regimes with large accumulated international reserves[1].

[1] In this thesis, two exchange rate regimes which are used extensively to differentiate the countries are fixed and flexible exchange rate regimes. There are varieties of regimes defined by the IMF as de facto classification of exchange rate regimes. Currency boards, conventional fixed peg arrangements, pegged exchange rates with horizontal bands and crawling pegs defined by the classification of the IMF are described as "fixed exchange rate regime" in this thesis. By flexible exchange rate regime, we mean managed floating and independently floating de facto regimes defined by IMF (2006)

The principal purpose in this thesis is to show that flexible exchange rate regimes and large hoarding of reserves could not provide a permanent protection against financial crises in developing countries. Even though it seems that developing economies have been experiencing some relief and stability since the second millennium, this should not be fully attributed to exchange rate regimes and accumulated reserves. There are a lot more factors than these to explain the stability of developing economies in the recent decade. We believe that decreasing volatility in capital inflows into developing countries due to the very low returns and excess liquidity in advanced economies; the loss of safe haven[2] roles of advanced countries in the years preceding the global financial crisis have played more significant roles in the stability of the developing world in the recent decade. These factors explain why developing countries did not experience considerable shocks in the last decade. Nevertheless, these factors led to capital inflow bonanzas in the developing world and these bonanzas might have made these economies more vulnerable to small shocks in their financial systems. Excess capital inflows made developing economies overheat by spurring credit growth and excessive borrowing in their economies. In the future, due to these fragilities, a small shock may dampen the financial system of developing economies similar to the tragic examples of the 1980s and 1990s. And as the main theme of the thesis, we claim that flexible exchange rate regimes and excess reserves do not have a magic to impede these shocks.

1.3 Structure of the Thesis

The main purpose of this thesis is to demonstrate that developing countries may witness financial crises in the future, even though they extensively implement flexible exchange rate regimes and accumulate large amounts of foreign exchange

---

classification. Hence by fixed exchange rate regime, the reference is an exchange rate which is not allowed to move or allowed to act within a determined band. And a flexible regime is referred to an exchange rate which is freely floated or a floating rate which is implicitly influenced by the foreign exchange interventions without having a specific path.

[2] Safe haven is described as the currency or assets of a country, which are preferred by the investors when the global or regional risks increase. Safe havens are generally regarded as the industrial country assets like USD, Swiss Franc or Japanese Yen.

[2] Safe haven is described as the currency or assets of a country, which are preferred by the investors when the global or regional risks increase. Safe havens are generally regarded as the industrial country assets like USD, Swiss Franc or Japanese Yen.

reserves. Throughout the upcoming chapters, we will support this main argument. The plan of the thesis is as follows.

In the second chapter, we will analyze the contemporary literature on financial crises. The motivation of this chapter is to document how economists have understood previous financial crises. Initially, the types of financial crises will be discussed in the light of existing views on these types, which are currency, banking and twin crises. Later on, the contemporary theories of financial crises will be elaborated on. These theories clearly reflect the interpretations of the scholars from the financial crises episodes in developing countries and also involve the recommendations of these scholars to prevent financial crises. Specifically, the emphasis will be on the mainstream three generations of crises theories. These mainstream theories will enable us to understand the dynamics of past financial crises episodes in developing countries. Later on, we will discuss the Post-Keynesian theories of financial crises. The Minskyan analysis on the natural instability of financial systems will be the center of the discussion on the Post-Kynesian theories. By analyzing the existing theories we will follow a different path from the literature: Each theory will be differentiated among each other according to the type of financial crises which they explain.

The existing theories explain the financial crises by focusing on the several dynamics and fundamentals of the economies which were hit by financial crises. Particularly, mainstream theories developed three generations of crises models in order to demonstrate the changing fundamentals in different crises episodes. Therefore, we may claim that each generation of crisis models differs from each other in many characteristics. Nevertheless, as the main finding of this chapter, these different generations have a consensus on some points: All mainstream three generation models state that financial crises in developing countries occur under the implementation of fixed exchange rate regimes due to the inadequate international reserves in these economies to defend the fixed exchange rate. The principal factor in the financial crises of developing countries in the 1980s and 1990s, according to the three generations of crises models, was the fixed exchange rate regimes in these countries and low levels of reserve holdings to support the peg. This is the main finding of the chapter, which we mention in the thesis on several other places.

The third chapter will deal with the progress of developing economies in the 2000s. In the 2000s, developing countries' growth performance has been prosperous and per capita income has been higher than the levels in the 1990s. Furthermore, developing countries lived a financially stable period in the 2000s. The years from 2002 to 2008 did not witness a developing country financial crisis and these years may be regarded as the stable and prosperous years of developing countries. In addition, the global financial crisis, which hit the industrial world severely, did not have a similar catastrophic impact on developing countries. The impacts of the crisis were even less severe compared to the past crises of the 1990s in developing countries. This chapter will demonstrate what changes occurred in developing countries in 2002-2007 and in what ways developing economies were affected by the global crisis. The purpose in this chapter is to show the dynamics of the relative calmness observed in the financial systems of developing countries. Another aim of this chapter is to indicate the arguments of the scholars and policymakers on the relative stability achieved in developing countries in this period.

Main findings of this chapter are as follows. In the 2000s, developing countries attracted extensive capital inflows, which have domestic monetary implications. Majority of the developing world began using more flexible exchange rate regimes and accumulated international reserves at record levels. Most of the developing world had current account surpluses or manageable deficits as opposed to the 1990s. They did not witness a significant financial crisis in 2002-07 and global financial crises did not hit them as severely as the advanced economies. Economists and policymakers associated this relative stability obtained in developing countries with several factors. Nevertheless, their argument is that flexible exchange rate regimes together with large reserves and sound current account positions protected these economies from experiencing significant financial shocks in the recent decade. This argument will be questioned in the fourth chapter.

As the main part of the thesis, in chapter four, we will theoretically analyze the purpose of the thesis, support the main argument with empirical examples and elaborate on the many different grounds of the main argument. The principal argument was that we could actually witness financial crises under flexible exchange rate regimes in developing countries. In order to support this, we will look at the

wide ranges of crises dynamics from external financing, sudden stops and dollarization to inadequacy of reserves and credit expansions in developing countries. This chapter will show the existing vulnerabilities of developing countries under flexible exchange rate regimes and how these vulnerabilities could turn into financial crises by using empirical supports from country examples. On which grounds these prospective flexible exchange rate crises could occur will also be the concern of this chapter. Since chapter four is the main discussion of the thesis, this chapter is the actual contribution of this study to the literature.

The main findings of the fourth chapter can be summarized as follows. Capital inflow surges in developing countries are principally associated with the external factors, on which developing countries have little control. The low levels of relative returns in advanced countries (depicted by the return differentials between industrial and developing countries) might have been an important explanation for the recent surge of capital inflows in developing countries. Furthermore, the loss of safe haven status of the industrial world after the global financial crisis might be the underlying factor of why developing countries dealt with the crisis better. As we will demonstrate in detail, if strong safe havens exist in the world, together with the higher returns in industrial countries, developing countries may experience significant financial shocks in the future. And these shocks, in the forms of sudden stops or capital outflows, might destroy financial systems in developing countries due to their mismatched balance sheet structures and higher volatility in their exchange rates. Even sound balance sheets might be affected by these shocks, due to the high vulnerability of financial assets taking part in the balance sheets in today's complex and leveraged financial systems. Furthermore, large hoarding of international reserves might not provide a permanent protection against financial shocks in developing countries. Given the easy mobility of capital across countries in today's global financial environment, any amount of funds might simply change their destinations in a short time. And depending on the shocks, the capital movements out of a developing country may deplete off the reserves of that country. In this case, even excessive amounts of reserves might not prevent a financial crisis in developing countries.

Besides all these possible exogenous shocks, developing economies under flexible exchange rate regimes may witness endogenous financial crises due to the collapse of credit cycles. Domestic credit levels have expanded substantially in developing countries, due to the high liquidity in these countries in the recent period. And significant portion of the credit lines in developing countries is held by the households, who are mostly unable to hedge against the risks. As the credit debt burdens of households and private sector widen, the risks of defaulting on these credits heighten too. For this reason, systematic defaults on these credit lines might end up with an endogenous financial crisis in developing countries. And irrespective of the exchange rate regime implemented and amounts of reserves accumulated, this kind of a financial shock might hit a developing country in the future. Lastly we will question whether current account surplus economies may experience financial turmoil. We will show that even developing countries with current account surplus may be hit by serious financial crises; however, the impacts might be less severe than the crises in deficit countries.

As the ending chapter of thesis, in the fifth chapter, we will mention some concluding remarks by summarizing the major findings and arguments of the thesis. Also in this chapter, by using the all findings of chapter 4, we will present and explain the conditions under which flexible exchange rate regimes may experience financial crises. This may also be a novelty in the literature.

CHAPTER 2

CONTEMPORARY LITERATURE ON FINANCIAL CRISES

2.1 Introduction

The history has witnessed plenty of economic downturns, which are referred to as "financial crises" in the literature, starting from the late 18th century. We may see the very first writings about the concept of crisis in a capitalist economy in the works of Karl Marx (Capital, 1894). Later on, many experts have studied on financial crises and produced several theories. As the frequency of crises has increased, the number of studies has soared and new approaches have been developed. This chapter's aim is to present what have been done in the literature on the issue of financial crises so far. We purpose to familiarize the reader with the insides of financial crises, which have been the concerns of economists for many decades.

To begin with, what could one understand from a financial crisis? Our broad definition is: "A financial crisis is a period of downswings occurring in an economy, which is caused by the crashes in the financial and banking sector or a huge loss in the value of a currency."

The periods of financial crises are the times of hardship and small or negative growth in an economy. And as should be understood from the definition above, financial crises are associated with two factors. One is the shocks in a banking sector and the other is the shocks in the value of a currency. If the shocks originate from a banking sector, this is a banking crisis and if the shock is triggered by the devaluation of a currency, this is called as a currency crisis. In section 2, we will differentiate these two types of crises. In section 3, we will focus on the theories of financial crises. Then, the mainstream three generations of crises models and the

Misnkian approach to financial crises will be evaluated. And in the fourth section we will conclude the chapter.

2.2 Types of Financial Crises

As can be interpreted from the definition above, a financial crisis is of two types; banking and currency crises. However, in many of the writings on financial crises, these two types have been used in the way as if they represent the same thing. The literature on crises has not paid much attention on the differences and interaction between these two types and usually these two terms are mixed up (Kaminsky and Reinhart, 1999). To have a better understanding about financial crises it would be very helpful to begin with discussing the differences between currency crises and banking crises.

A banking crisis may be defined as systemic failures in a financial sector due to the collapses in banking system, which have negative repercussions in the real and financial side of an economy. It is theoretically defined by Mishkin (1997) as a disruption to financial markets in which adverse selection and moral hazard problems become much worse. And thus financial markets become unable to efficiently allocate the funds to those who have the most productive investment opportunities (Mishkin, 1997).[3] Due to the problems in the financial channel of an economy, funds and loans are not picked by the wise and riskless investors. Financial institutions observing these asymmetric information problems decrease the amount of loans they issue because they cannot discriminate good credits from bad credits. Therefore productivity and investment declines and growth slows down. For instance a sudden rise in interest rates could lead up a banking crisis. Higher interest rates increase the probability of moral hazard behavior by the borrowers. The banks which are exposed to non-repayment of their credits could not pay their liabilities and may go into

[3] Adverse selection occurs before a loan contract is agreed on by a debtor and a creditor. The ones who most actively seek out a loan are the ones who possess the highest risk. Since the risky borrowers are willing to bear high interest rates, they are adversely selected by the creditors to give the loans. Hence the loans are mostly handed by the investors who have the risky investment projects and are less likely to pay the loan back. Moral hazard occurs after a loan contract is signed when the borrower engages in undesirable activities with huge risks (immoral) and as a result the lender is subject to the hazard that the loan will not be paid back (Mishkin, 1997).

bankruptcy. Furthermore, a liquidity shortage faced by banks due to the withdrawals of deposits by the deposit holders may lead banks to go into bankruptcy as well. These impacts would spread to other sectors in a short time and lead to a systemic banking crisis in an economy. This scenario is a pure financial turmoil which is not accompanied by a currency crisis.

The general description of a currency crisis in the literature is a sudden and large devaluation in the value of a currency due to the depletion of the foreign exchange reserves in central banks (Flood & Marion, 1998). A currency loses value in case of large drops in the demand for or excess supply of that currency. This scenario could happen when an unexpected capital outflow or a speculative attack hits a currency and if foreign exchange reserves are not enough to drain the excess supply of domestic currency in the market and inject the foreign exchange liquidity that the market demands for. The question is; can any sudden devaluation (depreciation) be called as a currency crisis? What should the extents of a devaluation be to name it as a currency crisis? The literature has not focused on these questions adequately and the dimensions of a currency crisis are not certain and clear-cut. Frankel and Rose (1996) addressed on this issue and in their study they came up with a definition of currency crisis by indicating the exact levels of a devaluation to be called as a currency crisis:

> A currency crisis is a large change of the nominal exchange rate (at least 25 percent) that is also a substantial increase in the rate of change of the nominal depreciation rate (exceeding the previous year's change by at least 10 percent.) (p.2).

From this definition, the preliminary factor in currency crises is the large devaluation of a currency. The literature on currency crises has paid most of their attention on the sudden devaluations in fixed exchange regimes. Their main focus was on the collapse of a pegged regime after a speculative attack. However, as we will cover in detail in the following chapters, the sudden huge depreciations in flexible exchange rate regimes are also an ingredient of a currency crisis.

Currency and financial crises are interrelated and the reasons for a currency crisis may be the outcomes of a banking crisis, or vice versa. Even though the type of crisis may occur in isolation from one another, most of the time they occur simultaneously. This simultaneous occurrence is named as "twin crises" in

economics literature. Kaminsky and Reinhart (1999), in their study on twin crises, find out worthwhile facts about twin crises and the relationship between a currency and a banking crisis. In general, currency crises are preceded by banking crises. The problems in banking sector put pressure on the currency and foreign exchange reserves. The aftermath collapse of the currency deepens the initial problems in the financial markets and aggravates the impacts of banking crisis. This evokes further devaluation of the currency and generates a "vicious circle", which demonstrates what happens utterly during the twin turmoil[4]. Usually both types of crises, in isolated occurrences, lead to downturns in the economy and recessions or slow growth. However, the severity of the crisis enhances as the economy faces the twin occurrence of crises. The most striking conclusion of the study of Kaminsky and Reinhart (1999) is that there is a high linkage between financial liberalization and the incidence of the both type of crises and twin crises.

> Banking and currency crises are closely linked in the aftermath of financial liberalization, with banking crises, in general, beginning before the currency collapse. In both types of crises, a financial shock, possibly financial liberalization or increased access to international capital markets, appears to activate a boom-bust cycle by providing easy access to financing (p.491)

Almost all financial liberalization efforts were followed by financial crises after the 1980s. Also as Kaminsky and Reinhart emphasized above, liberalization policies strengthen the link between financial and currency crises, propagate the twin crises episodes, and therefore crises have become more severe.

The vast majority of the crises in the 1970s were single currency crises, in other words, "balance of payments crises". In the 1980s and 1990s, the number of financial crises especially in the form of twin crises episodes spiked (see Table 1.1 in the first chapter). The reason behind this process is highly liberalized financial systems in countries in the 1980s and 1990s compared to the regulated and relatively

[4] As an illustration, let's assume the borrowers in a country engage in a moral hazard behavior and couldn't repay their credit lines. The banks' balance sheets seriously get damaged and they get unable to pay their debts to depositors. The depositors including foreign investors sense these risks and rush for their deposits and start holding foreign currencies. This would put downward pressure on the value of domestic currency as the reserves drain. After a huge devaluation, currency collapses and this is a currency crisis. The impact of devaluation on the banking system becomes more severe. Foreign currency debts held by financial institutions explore and they may fall into bankruptcy. The end result is a twin crisis with huge damages.

less open financial systems of the 1970s. Therefore we observe more banking sector oriented crises and twin crises episodes after the 1980s.

Up to now, we gave the overview of what is a crisis in economics literature, elaborated on two different structures of crises; and clarified the distinguishing factors and interaction between banking and currency crises. Now following the snapshot of the crises, we will elaborate on the dynamics of financial crises and possible explanations of the existing theories on them.

2.3 Theories of Financial Crises

Although the literature on crises theories starts with the Marxian theory of economic crisis, the literature demonstrated a boom since the 1970s because after the financial liberalization reforms in most of the world, both the frequency and severity of crises have risen. In recent studies, some theories have been modeled as empirical works. We will go into details of the recent theories on financial crises in this section. The recent literature on crises may be divided into two different approaches. One is the mainstream Neo-Liberal theories of crises, which are ideally represented as three generations of crises models. The other is the Heterodox Post-Keynesian explanation of crises, which takes the works of Hyman Minsky on the financial instability of economies as a basis. In this section, these two approaches will be clarified with the light of existing literature on these theories.

Furthermore, as we already stated in section 2.2, existing literature has not given much attention to the disparities and relationship between currency and banking crises since most of time, currency and banking crises are closely inter-connected and occur simultaneously. For this reason, the theories explaining crises generally lack this discrepancy and, in general, existing theories treat currency and financial crises as if they are the same concept. By presenting financial crises theories, we will explain each theory in light of the types of crises, which are currency, banking and twin crises. And each theory will be differentiated from others according to the type of crises which they belong to.

2.3.1 Mainstream Theories of Financial Crises

Mainstream crisis literature has its roots in famous Hotelling's economics of exhaustible resources (Hotelling, 1931). His theory for the pricing and optimal use of an exhaustible resource has become a basis for many further studies even after years and also inspiration for all mainstream currency crises theories. His rule asserts that the price of an exhaustible resource must rise at a rate which is equal to the rate of interest rate (Devarajan,1981) and over time the price path is determined by the requirement that the resource just be exhausted by the time the price has risen to the "choke point" at which there is no more demand (Krugman, 1997).Many mainstream crises models are the adaptation of this rule to the foreign exchanges, particularly main foreign currency held in the reserves of countries.

The mainstream crisis models began with the famous work of Krugman (1997), "A Model of Balance of Payments Crises" in 1979 and were developed further as the new waves of crises have occurred in the world scene. Some mainstream economists claim that crisis models are twofold; the old-style canonical models and new style self-fulfilling crises models. Some others prefer to classify the crises models as explained by three different generations; first, second and third generation of crises models[5]. The supporters of the former argument assert that the so-called third generation models exhibit similarities with the second generation, henceforth no reason to put them into a different category. In this work, we follow a different path in the classification of crises from the literature. We group the crises models into two main categories; early crises models consisting of first generation models and contemporary crises models consisting of the second and third generation crises models and we further indicate whether each generation is under the currency, financial or twin crises categories.

2.3.1.1 Early Crises Models

The old style crises models were initially developed by Krugman (1979) and his effort was further improved by Flood and Garber (1984). The work of Krugman

[5] As another approach, Erturk (2004) classifies the crises as capital account and current account driven.

was inspired by the model of Salant and Henderson (1978) on the stabilization of the gold price using the stockpiles of gold by the government. Salant and Henderson claim that governments use their stocks to stabilize the price of gold; when there is an upward pressure on the prices, they simply sell their stocks and in downturns they purchase gold from the market. However, they argue that this mechanism is subject to important risks: "Government attempts to peg the price or to defend a price ceiling with sales from its stockpile must result eventually in a sudden attack by speculators (Salant & Henderson, 1978, p.627). That is, fixing commodity prices at a certain level could not last longer and in the end, a speculative attack, which is a sudden and huge purchase of gold by speculators, result in the exhaustion of the reserves of governments and a sudden increase in gold prices. This eventually leads to the collapse of commodity price stabilization scheme.

The classical theory of exhaustible resources pricing by Hotelling (1931) implies that commodity prices should rise at the market rate of return. This price path is called "Hotelling path" in the literature. Salant and Henderson assert that when the stable price of gold, determined by commodity price boards, was higher than the Hotelling path (above the price when there is no commodity board), investors prefer to sell their gold holdings believing that holding gold doesn't provide a capital gain for them. Similarly, if the price is lower than the Hotelling path, investors perceive the commodity as a desirable asset and start purchasing the commodity. However, if the commodity board insists on stabilizing the price, the speculative attacks intensify and the stocks are depleted in a very short time. This mechanism explains why and how a speculative attack occurs.[6]

Krugman (1979) and further researchers applied this theory to the stabilization of foreign exchange prices. He treated foreign exchange reserves as the commodities in Salant & Henderson's work. Governments or currency boards stock a pile of foreign currency to stabilize the price of foreign exchange and defend the peg under fixed exchange rate regimes. And similarly, over time governments would

[6] The attack on commodities by private investors is justified as follows; when the stabilization scheme, which cannot withstand the depletion of reserves, breaks down, the commodity prices begin rising sharply. This would bring a huge capital gain for the investors, meaning that holding a stock of commodities and an ensuing speculative attack is attractive for investors.

not be able to defend currency peg, due to speculative attacks. Krugman (1979) clarifies the occurrence of this type of currency crises:

> A 'standard' crisis occurs in something like the following manner. A country will have a pegged exchange rate; for simplicity, assume that pegging is done solely through direct intervention in the foreign exchange market. At that exchange rate the government's reserves gradually decline. Then at some point, generally well before the gradual depletion of reserves would have exhausted them, there is a sudden speculative attack that rapidly eliminates the last of the reserves. The government then becomes unable to defend the exchange rate any longer (p.311).

The justification for speculative attacks on currencies is similar to the attacks on commodities and is discussed in another work of Krugman(2003). The speculators observing that the reserves are gradually exhausting foresee that, in the future, the fixed exchange rate regime will not be defended. This would make holding foreign exchange more attractive than domestic currency, because in the future increasing prices will enable the investors to obtain large profit. Hence, a sudden and huge run on foreign currency causes a currency collapse, large devaluation and in the end, gives way to a financial crisis.

The Bolivian crisis in 1982-85, the Brazilian crises in 1983, 1986 and 1989-90, the Chilean crisis from 1971-74, Peruvian crises in 1976 and 1987 and the Uruguayan crisis in 1982 can be considered as the examples of the first generation of financial crises (Saxena, 2004). Three important features of the first generation crises are given importance in the literature. Now in the next part we will analyze them.

Firstly, according to the models of the first generations of crises, the root cause of crises was poor and inefficient government policies (Erturk, 2004; Krugman, 1997; Saxena, 2004). So the models basically indicate that governments get the crisis which they deserve (Krugman, 1997). In the first generation models, the emphasis is on some fundamental macroeconomic disequilibrium such as excessive budget deficits, large public debt and monetization of these debts by central banks. According to these models when governments fall into the trap of uncontrollable budget deficits and hence debt trap, they started to meet these responsibilities by making central banks issue money which, in the end, brings about high rates of

inflation. With pegged nominal exchange rate, the acceleration of prices results in the real appreciation of domestic currency. Real appreciation implies high current account deficits because export commodities become more costly and export revenues dampen after the appreciation. Current account deficits must be financed by foreign exchange holdings. Hence sufficient amounts of foreign exchange reserves are needed to finance these deficits and central banks try to close this gap by exhausting their foreign exchange reserves. The deficit problem turns into a shock at the point where the exhaustion of reserves begins to exceed a threshold level after which devaluation is inevitable. When existing reserves are close to this threshold, Krugman (2003) states the "shadow price" of foreign exchange (the value of foreign currency when there is no pegged exchange rate) exceeds the pegged value of foreign currency. Foresighted investors observing that the shadow value of foreign currency is higher than the pegged value rush to exchange their domestic currency holdings with foreign currency and run away from domestic currency. The devastating result is much earlier devaluation than expected, foreign exchange reserve exhaustion and a currency crisis. The initial cause of this crisis was the excessive budget deficits and funding these deficits by printing money. In short, governments get what they deserve due to their poor fiscal policies.

Second, the first generation crises models are deterministic. They imply that a crisis is inevitable given the poor policies of governments, and the timing of a crisis is predictable (Burnside, Eichenbaum, & Rebelo, 2004; Eichengreen & Wyplosz, 1993; Krugman, 1997). Since crises are the result of the inconsistent policies of governments and irresponsible money expansions by central banks, predicting a financial crisis in the countries suffering from these problems is not difficult.

Third, the first generation crises mainly didn't inflict a big damage to the countries experienced them. They simply revealed the problems which had already been alive in the problematic economies (Erturk, 2004; Krugman, 1997). Old-style crises have occurred due to the existing problems in the real sector and they already had shown their impacts on the real economy. The outcome of the crises, which is currency devaluation, occurs due to the shocks and disequilibrium in the real side. And the devaluations did not lead to new contractions in output and big macroeconomic problems.

Lastly, we need to add another characteristic of the first generation type of crises, as a fourth feature. The first generation crises may be identified as single currency crises not accompanied by banking crises. The rationale is that neither the causes of currency collapse are from banking sector fragilities nor the collapse caused any significant damages to financial sector. The devaluations may have worsened the balance sheet position of banks however, the magnitude of this impact is not enough to name the crises modeled by the first generation of crisis theories as a banking crisis. Kaminsky and Reinhart (1999) state that the regulation of the financial systems was stick and the financial operations were not liberalized as much as today. This may be the reason why the currency collapse didn't contaminate the financial sector. Therefore, the old-style canonical crises theories are the modeling of isolated currency crises, which are not accompanied by banking turmoil.

2.3.1.2 Contemporary Crises Models

The first generation models we summarized above don't fully explain the most of the crises occurred in the 1990s. The currency crisis which hit the European Monetary System in 1992-93 and the Mexican Peso crisis in 1994 have demonstrated that the classical approach to understand crises is no longer valid. This idea was initially mentioned in a seminar paper by Obstfeld (1994). These crises required that a new approach should be developed. Hence new contemporary models were developed by economists after the 1990s, namely second and third generation crises models.

2.3.1.2.1 Second Generation Crises Models

The very first studies of the second generation models were based on Obstfeld's (1986) paper titled "Rational and Self-fulfilling Balance-of-Payments Crises". The other experts have further contributed to Obstfeld's work and also developed new second generation crises models (Eichengreen, Rose, Wyplosz, Dumas, & Weber, 1995; Krugman 1996; Obstfeld, 1994). The principal factor in the both first and second generation of crises models is same; a sudden devaluation and

abandonment of the peg due to reserve exhaustion after a speculative attack. However, at this time the speculative attacks and thus exhaustion of foreign exchange reserves were no longer tied to the disequilibrium in macroeconomic fundamentals such as high budget deficits and the poor macroeconomic policies of governments. "In the first model, the speculative attack merely anticipates events that would eventually occur; in the second model, in contrast, the attack provokes events that would not occur in its absence" (Eichengreen & Wyplosz, 1993, p.53). That means in the second generation models, the root cause of crises is speculative attacks themselves without prior problems in an economy. Many economists believe that these new crises have a self-fulfilling characteristic. "… Balance of payment crises may indeed be purely self-fulfilling events rather than the inevitable result of unsustainable macroeconomic policies." (Obstfeld, 1986, p.72). By self-fulfilling crises, the literature means that the main cause of crises is the expectation of investors that the crisis will happen; in other words, when people expect a crisis to happen, it merely happens. The main difference from the first generation is the self-fulfilling feature of the second generation.

Nevertheless, the details of the second generation models may differentiate from economists to economists. Some gives more weight to self-fulfilling thesis and some attaches less weight to it. Obstfeld and Rogoff (1995) support the idea that even sustainable pegs will eventually collapse with the existence of a speculative attack. When people believe that the peg would be in trouble in the future, without the existence of problems in the macroeconomic fundamentals, currency collapse would occur. Eichengreen et. al. (1995) blamed perfect international capital mobility under fixed exchange rate regimes for the fundamental cause of the second generation crises. And in their model, they propose floating regimes or monetary unions as alternative policies to prevent the huge impacts of speculative attacks.

Lastly, Krugman (1996) claims that the second generation crises of the 1990s do not exhibit a fundamental difference from the first generation crises. According to him, the macroeconomic fundamentals are the same in both generations, and the difference of the second generation is the assumptions about the long-run sustainability of these fundamentals. By fundamentals, we mean that the indicators related with the functioning of an economy such as budget deficit, current account

balance, unemployment etc. In the classical models, these fundamentals were already deteriorated before the crises and the crises occurred as the inevitable result of this deterioration. In the second generation, the negative concerns about the future trend of these same fundamentals, made the crises possible. This concern comes from the basic trade-off governments have between the sustainability of the fundamentals and the stability of fixed exchange rates. When people doubt that the fundamentals will worsen, and governments will concern more about the problems in the fundamentals; people start thinking that government would not concern the stability of the peg much. This trade-off that investors perceived leads to speculative attacks against currencies, because they believe that the peg will not be sustained. Put it differently, negative news about the sustainability of the macroeconomic fundamentals of an economy could lead to pessimistic expectations about the sustainability of fixed exchange rate.

An example of crisis, which occurred due to this trade-off, according to the second generation models, is the crisis of European Monetary System (EMS)[7] in 1992-93. The macroeconomic disequilibrium in the fundamentals after the unification of Germany (such as high unemployment rate), made investors expect that the main objective of the governments would be money expansion to spur the employment. This evoked investors that the EU governments would not care the sustainability of the peg and care much of the increasing unemployment or inflation. Investors started to expect that the fixed exchange rate regime will not be sustained over a long time. Due to the fear of devaluation, profit-seeking investors suddenly started to purchase foreign exchanges, in order to take a position against prospective devaluation. Hence the reserves of central banks started to diminish towards a threshold level. More and more investors observing the exhaustion of reserves, fearing of upcoming devaluation, rush to exchange their domestic currency holdings. The result was an inevitable devaluation at the earliest moment and this led to a

[7] European Monetary System (EMS) is an arrangement signed by European countries to fix their exchange rates among each other within a narrow band in order to eliminate negative impacts of the exchange rate fluctuations on trade and inflation. However, in 1992, the speculative attacks on the main currencies of the System, such as huge short-selling of pound by Soros, led to currency crises in the UK and Italy and they left out the EMS and allowed their currencies to depreciate. For deeper analysis of 1992 EMS crises look at; Eichengreen and Wyplosz (1993) and Rose and Svensson (1994)

financial crisis in some of the EMU economies. Ertürk (2001) summarizes this process as once speculators sense that countries would do better by abandoning the fixed exchange rate, a speculative currency attack will inevitably ensue.

Since the second generation models state that crisis is mostly shaped by the expectations of investors and what people expect comes true unpredictably in the end, the experts describes this kind of a crisis as a self-fulfilling crisis. In the first generation models, the crisis was predictable and deterministic since the main factor leading to crises is government insolvency and monetization of its debt and hence countries having this sort of problem may be expected to experience a crisis. However, in the second generation crises, the early warnings are not observable and due to the self-fulfilling characteristic of crises, predicting a crisis and taking measures against it is almost impossible.

Additionally, the crisis-hit countries in the second generation models did not experience any recession and even their economies expanded after the crises. The currency crunch had not profound impact on the real side of the economies. For example, Britain and Italy's growth become even higher after they left the EMS[8] after the crisis.

Lastly, the second generation crises models didn't address on the shortcomings in the financial sector and collapse of any banking institutions. And also the countries in the second generation models did not experience a systemic collapse of banks and financial companies. The most definite outcome of the crises was the devaluation in the fixed exchange rates or the abandonment of the peg. For this reason, we assert that the second generation models are the theorization of individual currency crises.

2.3.1.2.2 Third Generation Crises Models

When a new wave of crises hit the world in the mid and late 1990s like Tequila crisis in Mexico, the crises of East Asia, Russia, Argentina and Turkey, economists started to question the validity of the existing crises models. Many came

[8] This situation led Paul Krugman (2003) to make his famous joke that "a statute of George Soros should be erected in Tarafalgar Square".

to conclusion that existing models are not adequate to fully understand the mechanisms of the crises in these countries. While many economists believe that a slight modification to the second generation models is enough, some others began developing the third generation theories to explain the fundamentals of the new crises episodes. The underlying mechanism of the currency crashes in the new models is the same as in the cases of previous two generation models; a sudden devaluation in the exchange rate or abandonment of the peg due to speculative attacks and reserve exhaustion. However, at this time, as Krugman (1999) points out, contrary to previous generation crises, the new generation crises led to more devastating outcomes in the financial sector and very damaging recessions on the real side of the economies. In most of the last generation crisis countries experienced, on average, 8 percent recession in GDP, high unemployment rates and uncontrollably high interest rates. This situation entailed most mainstream economists to create new models and emphasize on the financial sector vulnerabilities in the run-up of the crises in their models. One of the most important differences of the new type of crises from previous generations is the accompaniment of financial and banking sector crises with currency collapse. Hence the third generation models can be considered as the models of twin financial crises.

There are three prevailing features of financial crises demonstrated by the third generation of crisis models. The first one points out the moral-hazard behaviors of banks as the main reason of the crises (McKinnon & Pill, 1997). Burnside, Eichenbaum and Rebelo (2004); and Corsetti, Pesenti, and Roubini (1999) adapted this moral hazard theorem to new generation crises and concluded that implicit guarantees by government to banks for their borrowings were the root cause of the new generation crises.

> In the presence of guarantees banks borrow foreign currency, lend domestic currency and do not hedge the resulting exchange rate risk. With guarantees, banks will also renege on their foreign debts and declare bankruptcy when devaluation occurs. We assume that the government is unable or unwilling to fully fund the resulting bailout via an explicit fiscal reform. These features of our model imply that government guarantees lead to self-fulfilling banking-currency crises (Burnside, Eichenbaum & Rebelo, 2004, p.31).

The key channel is that the implicit guarantees given by governments to their banking sector lead to over-borrowing from foreign sources and increase the capital loss in the case of devaluation. This ends up with the collapse of banking sector and financial turmoil.

The second approach in the third generation models puts emphasis on the illiquid positions of banks. Chang & Velasco (2000) define illiquidity as "a situation in which the financial system's potential short-term obligations exceed the liquidation value of its assets" (p.1). They then assert that

> We develop a model in which financial crises in emerging markets may occur when domestic banks are internationally illiquid. (...) Financial liberalization and increased inflows of foreign capital, especially if short term, can aggravate the illiquidity of banks and increase their vulnerability (Chang, & Velasco, 2001, p.1)

The short-term liabilities of banks (deposits) may be called suddenly by the depositors when they perceive a risk that banks would not be able to repay their deposit commitments. If the short term assets are not enough to meet the payments of liabilities, banks need to liquidate their long-term assets. The increasing need for liquidation leads to devastating impacts on the long-term assets of the banks and can bring about defaults. In this approach, the mechanism is twofold; firstly, due to the need for liquidation of assets (loans or reserves of the banks), the credits to private sector squeeze and hence investment declines. And secondly, the devaluation increases the foreign-currency denominated obligations of firms and this requires short-term financing of firms. However, since the banks are illiquid anymore, they are not able to finance firm' increasing burden of foreign debt, and hence the firms go into bankruptcy and investment declines.

Lastly, in relation to the illiquidity discussion above, Krugman (1999) emphasizes the roles of the deteriorations in the balance sheets of private firms in explaining the financial collapse in the third generation crises. According to Krugman, contrary to the previous generation crises, devaluations in exchange rate must have contractionary effects[9] on output due to two mismatch problems in the

[9] In the previous generations, devaluations did not lead to decline in the output and usually output expanded due to positive impact of the devaluation on exports. However, as we observed in Asia, the expansionary impact is only observed in the trade balances of the countries. For example in Thailand,

balance sheets of the firms; maturity mismatch and currency mismatch. Maturity mismatch theorem basically states that there is an inconsistency between the maturity of assets and maturity of liabilities in the balance sheets of firms or banks. Usually the long-term investment projects bring about higher rates of returns than the short-term projects. Hence investors prefer spending money on the long-duration projects and finance it by the short-term debts from financial intermediaries like banks. So if the duration of projects being financed is longer than the maturity duration of the debts of a company, this means a maturity mismatch in the books of the company. Whenever a self-fulfilling panic occurs and people withdraw their claims from banks, the banks would not be able to finance firms due to fall in their deposits. As a result, the projects of firms had to terminate prematurely and the gains from the investment declines. If this occurs as a whole in an economy in a systematic way, maturity mismatches may lead to crises.

Additionally, as the corporations hold huge amount of foreign debt, a devaluation due to the self-fulfilling capital reversals results in the expansion of the debt burden and thus deterioration in the balance sheets. The deterioration gets deeper when the firms have huge debt commitments denominated in foreign currency and have the assets and claims denominated in domestic currency. So, if a company holds more foreign currency liabilities than foreign currency assets, this is called currency mismatch in balance sheets. This effect, namely "currency mismatch" in balance sheets, evokes investment projects to fail, bank runs and default of the firms. The contractionary effect of currency mismatch in the end, more than offsets the expansionary outcome of the devaluation on exports and a recession occurs. For instance, even though the current account position of South Asia shifted from 5% deficit of GDP in 1996 to 9% surplus of GDP in 1998, we observed on average 5% decline in output in the South Asian countries in 1997-98.

As explained so far, the third generation models have association with the collapse of financial and banking sectors. Besides the devaluation of the currency, banking sector failures with illiquidity, currency mismatches or government guarantees took important place in the third generation literature. Hence, as a fourth

current account deficit to GDP ratio was 10 percent in 1996, but after the crisis it turned out to be 8 percent surplus in 1998. Nevertheless, this trade expansion did not lead to output growth and most of the third generation crises-hit countries experienced big recessions.

characteristic, we may claim that the third generation crises are twin crises with the simultaneous occurrence of currency and banking crises.

The discussions above are the main characteristics of the third generation of crises models. Now we will look at the differences between second and third generations. “Currency and Maturity Mismatch” thesis highlights one major difference of the third generation from the second generation. In neither of the second generation models balance sheet mismatches hold an important place. Another difference is that second generation models analyzed the crises in EMS which is the group of advanced countries. However, the third generation models address on the crises in developing countries. The difference of generations in terms of country groups may also explain why balance sheet mismatches theory takes place in the third generation models. As Mishkin (1997) points out, advanced countries usually have debt contracts denominated in local currency and due to low inflation in developed countries the contracts are long-duration. This eliminates the risk of balance sheet mismatches in advanced countries and may explain why the crisis-hit countries in second generation didn’t experience any recession. Nevertheless, the third generation crises models indicate that the crises-hit emerging countries experienced severe recessions. Another difference between second and third generation crises is that the third generation crises models have great focus on the role of financial fragilities and banking problems, hence it is, in a way, a modeling of “twin crises”. Whereas second generation models didn’t much address on the financial side of the economy, and as we discussed above, it is the modeling of “currency crises”. We can see the summary of all three generations of crises with their reasons and general characteristics by looking at Table 2.1.

Table 2.1: Causes and Characteristics of Three Generations of Crises

Crises	Causes	Characteristics
First Generation	• *Excess budget deficits and monetization of government debts.*	• Crises were deterministic • Damage is moderate • Pure currency crisis
Second Generation	• *Trade-off between the macroeconomic objectives and sustainability of the peg.* • *Perception of investors that the peg will not be sustained.*	• Self-fullfilling, so not deterministic • Damage is moderate • Pure currency crisis
Third Generation	• *Moral-hazard and implicit guarantees by governments.* • *Illiquidity of banking system* • *Balance sheet mismatches.* • *Perception of investors that the peg will not be sustained.*	• Self-fullfilling, so not deterministic • Damage is huge • Twin financial crisis

2.3.2 Post-Keynesian Theory of Financial Instability

The origins of Post-Keynesian or Heteredox approach to financial crises come from the influential work of Hyman P. Minsky (1992), which is titled Financial Instability Hypothesis. The followers of this hypothesis later refer to financial crises as Minskyan Moments or Minskyan Business Cycle Fluctuations. Minskyan hypothesis asserts that financial crises are endogenous events. After a period of financial stability, the system turns into a financial instability period as a natural process. This instability is not generated by exogenous shocks but the process itself naturally creates its own instability. Minsky (1992) firstly emphasizes on the complexity of the modern financial system and the financial relations among its actors:

> Households (by the way of their ability to borrow on credit cards for big ticket consumer goods such as automobiles, house purchases, and to carry

> financial assets), governments(with their large floating and funded debts), and international units (as a result of internationalization of finance) have liability structures which the current performance of the economy either validates or invalidates. An increasing complexity of the financial structure, in connection with a greater involvement of governments as refinancing agents for financial institutions as well as ordinary business firms (both of which are marked characteristics of the modern world), may make the system behave differently than in earlier eras (p.5).

The basic and most crucial interaction among the agents in a financial system is the debt relation. He expresses his basic framework by focusing on the debt relationship between lenders and borrowers. Lenders issue debt to make profits (interest income) and borrowers take this debt to make investment

2.3.2.1 Minskyan Financial Crisis in a Closed Domestic Economy

Minsky, in his writings, describes financial instability hypothesis for a closed domestic economy. He defines three profiles of a borrower engaging in a financial activity in a domestic economy; Hedge, Speculative and Ponzi financing profile. The hedge or standard profile represents a firm which has sufficient cash flows to cover its current and future debt commitments. There is no risk of a defaulting on debt neither today nor in the future because a firm with a hedge profile holds sufficient cash flows and its expected cash flows are greater than future debt commitments (Minsky, 1992). In other words, the present value of the investment which is financed is much greater than zero. If the most firms are of this type, no financial instability is expected in this economy.

Sometimes, a firm may not be able to obtain sufficient cash flows to cover some of its commitments. In that case the firm may need to repay its obligations from the income account in liability side. However, in long-term, over the maturity of the loan, the firm is able to complete its repayment obligations. Minsky labels this behavior as speculative profile. In any cases of hedge or speculative profile, the present value of the project becomes positive. However, a firm with speculative profile is not safe anymore and a shock may lead to a trouble in repayments.

Finally, the most popular profile of Minsky is “Ponzi profile”. In this case, the firm is not able to meet its current cash commitments with existing flows and the

assets of the firm would not be able to compensate these obligations. This profile occurs when an unexpected financial shock occurs to a firm with a speculative profile. Now, the firm gets into a situation that the only remedy of paying the existing debt is collecting a new debt. The loan is financed by new debts. The only way for firm to convince the creditor is that the firm is able to attract new loans from other lenders. As long as the firm is able to collect new debts to pay the principal and the interest of the loan, the firm could operate. Nevertheless, this creates an extreme fragility in the financial system. Minsky(1992) asserts that speculative and Ponzi financing are very risky profiles for an economy:

> It can be shown that if hedge financing dominates, then the economy may well be an equilibrium seeking and containing system. In contrast, the greater the weight of speculative and Ponzi finance, the greater the likelihood that the economy is a deviation amplifying system (p.7).

Furthermore, Agosin and Huaita (2011) claim that an economy with Ponzi finance needs to roll over not only principal but also to borrow more to pay interests of its accumulated debt. Ponzi financing units need to sustain attracting and collecting new debt and accumulation of these debts leads to high interest costs for these units. A firm with Ponzi finance has to meet these interest costs together with the principal. This is a huge risk for the firm and a small disturbance, like a rise in interest rate, may lead this financing scheme to be destroyed.

Additionally, a small shock to a firm with Ponzi finance may explode the whole financial system. Kregel (2004) imitates this situation as “a pyramid collapsing like a house of cards”. For instance, if a firm becomes unable to find funds to pay its current interest on its loans, the lender doubts the viability of the firm. Other lenders observing that the firm does not meet its obligations, stop lending to the firm. The firm becomes insolvent and defaults on its debt. The creditor which has receivables from the firm falls into trouble as well. The lenders issue new debts for their need of cash flows. As the number of issuers increase, this result in, what Minsky calls, a “debt deflation”. Furthermore, the borrowers begin to sell their assets to repay their liabilities. Asset prices fall to very low levels as everyone is in a “sell position”. The impact spreads to other lenders and firms in the market, and the financial pyramid collapses like a house of cards instantly. This collapse even makes

the firms with a hedge profile to turn into a speculative or Ponzi profile. Hence, the result is a financial crisis with large damages.

According to the Minskyan analysis, all these financial fragilities and the crises following the increasing fragilities were endogenous events. The firms initially operating with hedge profiles will gradually move into speculative and then Ponzi financing (Minsky & Kaufman, 1986). According to Minsky, during the domination of hedge financing profile in an economy, investors come to expect that asset prices will increase in the future. Due to the expectations of rising asset prices, new investors enter the market in search for profit. It leads to credit loosening and overinvestment boom in the market. After that point, both borrowers and banks tend to operate with lower margins of safety because they still expect that their assets will gain value. Also their search for profit and the positive outcomes of investment boom make naturally the firms and banks operate in risky positions. The market becomes dominated by speculative and Ponzi financing investors, who need to borrow to pay the principal and interest of their debt. Nevertheless, the boom eventually turns into bust. The spiking asset prices and credit debt burdens of borrowers may lead to the troubles in the repayment of debts. Asset prices start declining and investors become unable to repay their debts due to the loss of income. The aftermath consequences of this are summarized by Agosin & Huaita (2011):

> The consequence is 'revulsion': a flight from illiquid assets that first wipes out the Ponzi participants and lowers expected future incomes of speculative investors and even of hedge investors. The bust itself has the effect of transforming speculative investors into Ponzi investors and hedge investors into speculative ones. Credit contracts and debt deflation ensues (p.4).

Minsky set up these three different financing profiles for the domestic players in a closed economy. Hence we should assert that all his theory of crisis is an explanation of domestic banking crises without the accompaniment of a currency crisis. Nevertheless, subsequent Heteredox economists apply the Minskyan analysis to the open economy cases and try to explain the financial crises in developing countries economists (Kregel, 2004; Wray, 2008; Wolfson, 2002). In the following part, we will investigate the application of the Minskyan theory to the financial crises in developing countries engaging with open capital accounts.

2.3.2.2 Minskyan Approach to Contemporary Developing Country Financial Crises

The basic framework of Minsky has an application for developing countries with open capital accounts. The profiles explained above are applied by other Heterodox economists for a sovereign developing country which is borrowing abroad. And a country may well be defined with Ponzi finance if the country borrows new debt in order to repay its interest and principle debt commitments. Similarly, a small shock to a country with Ponzi profile could lead to a full-fledged financial crisis and now the impacts of the crisis do not stay in the boundaries but they spread to other global players which the country interacts with.

We will now explain how a developing economy falls into Ponzi finance. Developing countries have low saving rates compared to industrial countries and their small savings are not adequate to compensate all investment opportunities in these countries. Hence they need to resort to external financing for their investment projects. Also due to their lower savings and higher need for external borrowing, they provide higher returns to the external funds compared to developed countries with higher saving rates. This would make the lenders in developed countries willing to lend to developing countries because the lenders seek for higher returns in developing economies. By holding these debts, developing economies are loaded with the obligation to repay the principals and interests of these debts. Kregel (2004) defines five channels which a developing economy could finance its debt commitments:

- A positive current account balance;
- Foreign exchange reserves;
- Net Private capital inflows;
- International development assistance; and
- Foreign debt forgiveness. [10]

A country should have current account surpluses to hold positive cash inflows. However, as Kregel (2004) points out due to the reliance on small number of export commodities with highly reliable demand and prices, the net export earnings of developing economies are volatile. Furthermore, due to the low

[10] Implications of all these factors for the financial crises in developing countries will be analyzed, in detail, in chapter 4. For the time being, their simple role in meeting the debt commitments of the countries will be expressed.

production capacities and their dependence on intermediate goods produced in industrial countries, most of the time developing countries have negative current account balance. Current account deficit means the country needs further external borrowings which lead to the problem of further repayment of these borrowings.

Another channel of repayment is the accumulation of foreign exchange reserves. If foreign reserves are accumulated from the past current account surpluses, then we may claim that the source of repayment comes from positive cash flows. And if the external obligations of developing economies are provided by these reserves (filled by past positive cash inflows), then the country stays very close to hedge profile. Nevertheless, we emphasized that the net export earnings are very volatile and generally current account deficits prevail in developing economies[11]. Hence, if a developing economy accumulates reserves for the future usage, mostly it does this by borrowing. Thus, as in the case of current account deficits, this puts more weight on external debt commitments of developing economies.

If a country does not have an adequate positive balance in its current account and its reserves are not the outcome of positive external cash flows, there remains only one option for the country; attracting more external funds to meet its external obligations. Additionally, in cases of current account surpluses, this Ponzi dilemma would not be eliminated completely. In this case, these developing countries hold large external commitments too. However, these commitments do not stem from the current account, but the capital account. Developing countries are generally destinations for carry trade opportunities due to the high yields of their assets. The external funds coming for exploiting this opportunity (not for the purpose of real sector investment), add new liabilities to the accounts of firms and banks in developing countries. This is because these firms and banks need to repay these funds with their interests at the maturity. Hence, capital flows coming to obtain profits are a new external debt burden for emerging markets, even though they have

[11] It seems that many developing economies had positive current account balance or manageable deficits since 2002. However, since the Minskyan analysis gives a general framework about developing countries, the historical and prevailing current account position in developing economies is more important for now. And historically, developing economies faced with large deficits, so the assertion that developing economies have persistent deficits may not be wrong for this discussion. Furthermore, it is doubtful that this recent improvement in current account balance in developing countries is sustainable for a long time.

sound current account positions. In other words, a developing country should hold sustainable and positive net capital inflows and make regulations that ensure that the flows of foreign capitals are moving freely. This is a Ponzi finance game for a country. The country is bound to repay its external commitments by borrowing abroad. Furthermore, as we explained, developing countries' higher yield opportunities make the investors of industrial countries eager to exploit this opportunity. They continue to lend as long as their portfolios earn higher returns. Figure 2.1 depicts the dilemma which a developing economy with Ponzi financing scheme falls into. A country with Ponzi profile has to deal with tons of external debt burden. And it becomes that the only option for financing these debts is borrowing more.

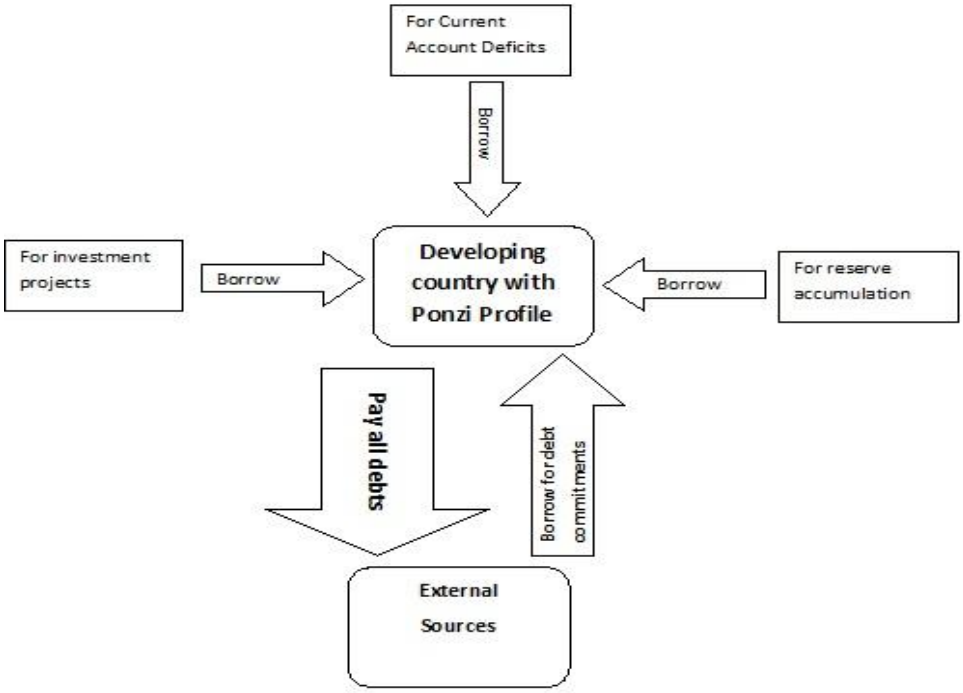


Figure 2.1: The big debt dilemma of a developing economy with Ponzi Finance Profile

As monitored in the closed economy version of the Minskyan hypothesis above, the Ponzi profile is so risky for a firm and now, in this case, for a developing economy. A small shock could destroy the financial system in a very short period. For instance, a decline in net capital inflows would make a country unable to find funds to repay their external debts. As a result of that, banks and firms may default

on their debt commitments, bankruptcies may occur and this may lead to full-fledged financial crises which have international implications. In addition, a high devaluation or depreciation may lead to collapse of financial system in countries facing aforementioned conditions, since the debt burdens of the institutions boom and bankruptcies occur. An unexpected increase in market interest rates could result in the similar outcomes.

Kregel (2009) states that in the post war period and Bretton Woods era, the financial system was more stable since economies could be considered as having hedge profile or speculative profile. There were many restrictions on capital movements. The IMF was the sole international liquidity provider. In case of a shock, countries were applying contractionary policies to slow down the growth and hence reduce imports so that they would have held current account surplus and positive cash inflows. Majority of foreign capital inflows were in the form of direct investment. Hence these were preventing the economies from engaging in Ponzi financing. A shock could be alleviated by internal contractionary policies or the assistance of the IMF. So the shock could disappear before turning the country into Ponzi finance. However, after the 1980s the system has been more growth oriented and dependent on international funds moving around freely. Developed economies have been lending in their own currency, aggravating the foreign currency risk of developing economies. For this reason, last 30 years have witnessed more destructive financial crises in developing economies with serious damages to real sector.

Similar to the discussion about the Minskyan approach on closed economy banking crisis, Minskyan analysis of developing country crises with open capital accounts exhibits that financial crises are endogenous events. Both the borrowers and lenders in the stability period, tend to behave with low margins of safety and seek for opportunities for higher profits. Frankel & Rapetti (2009) state that the tranquility of states in full-employment gradually leads to the decreasing perception of risks and increasingly optimistic expectations about asset returns in the future. And as the margins of safety decline and returns increase, they engage in risky activities. These risky activities make developing countries naturally fall into Ponzi profiles. Hence, stability periods are followed by fragility and instability periods and may end up with

financial crises in current international financial system. Wray (2011) states the endogenity of crises in these words:

> Minsky's view is that the transformation of the economy and its financial structure from robust to fragile is due, not to external market factors like government intervention and regulation, but to the "normal" operations and incentives of financial capitalism (p.6).

Therefore, the Minskyan theory of financial crisis, is a depiction of an endogenous financial crisis occurred during a natural process given the natural fragility of current international financial system. This is why all Heteredox economists call each individual crisis as a recurrence of a "Minskyan moment"[12].

Lastly, if we need to classify the open macro-economy application of Minskyan theory in terms of the types of crises discussed before, we should clearly conclude that it belongs to the category of the theory of twin financial crises, which include both banking system failures and collapse of currencies. When banking system collapses in countries with Ponzi financing, foreign investors withdraw their funds and this would result in the domestic currency to lose a huge value and end up with large devaluation and currency crises. In the end, the collapse of the currency aggravates the crises in the banking system and continues as a vicious spiral.

2.4 Conclusion

Throughout this chapter, we investigated the contemporary literature on financial crises. Initially, we gave the broad definition of a financial crisis. We presented the types of crises, which the literature did not pay much attention. The types of crises are banking crises, currency crises and twin crises. Later, the theories developed to understand the recent financial crises were explained in detail. Also we tried to fill the existing gap in the literature on the types of financial crises by explaining the theories of crises in terms of currency, banking and twin crises.

Our main aim in this chapter was to indicate the dynamics of contemporary financial crises with the leading existing theories. The contemporary crises theories

[12] Kregel (1998) exampflied the Asia crisis as a Minskyan moment. Davidson (2008) questions whether the recent global financial crisis is a Minskyan moment. Frenkel and Rapetti (2009) assert the recent financial crisis in the USA corresponds very neatly to Minsky's theory of financial crises.

were presented under two main headings: Mainstream crises theories and the Minskyan approach to financial crises. While the mainstream theories highlight the inconsistent internal or external policies and self-fulfilling prophecy of the crises, the Heterodox literature focuses on the endogenity of financial crises. The one significant implication of the crises models in mainstream theories is that all three generations of models state that financial crises occur under fixed exchange regimes. And they all model the collapse of pegged exchange rates in triggering the financial crises in developing economies. Minskyan approach discusses the role of indebtedness of countries in the occurrence of a financial turmoil and they do not differentiate, to a great extent, the exchange rate regimes. As the main purpose of the thesis, in the upcoming chapters we will show that the crises could happen under flexible exchange rate regimes. For this reason, we will present the situation in developing economies in the 2000s, when the developing economies increasingly used flexible exchange rate regimes, in the next chapter.

CHAPTER 3

DEVELOPING COUNTRIES IN THE 2000S

3.1 Introduction

The first decade of the 2000s may be called as the era of full financialisation and sound growth for developing countries. Developing countries demonstrated, in general, a high GDP growth and the per capita GDP has risen over recent decade. Current account position and fiscal situations have gotten better in most of the developing world. Besides these real sector developments, the financial markets in developing economies have exhibited important transformation as well. Financial institutions have become deeply integrated with developed countries, and the presence of international banking and financial institutions has increased dramatically in developing countries. Till the global sub-prime financial crisis, none of the emerging economies experienced a serious financial crisis which, in the past, was observed on many occasions. In addition, the global financial crisis which hit industrial economies severely didn't have such a disastrous impact on developing countries. Even though developing economies were damaged by the crisis, the damages were not as destructive as the financial crises happened in developing countries in the 1990s. The aim of this chapter is to depict the economic and financial progress experienced in developing countries in the 2000s. Also we will discuss the explanations of the literature on the relatively stable atmosphere observed in the financial markets of developing countries in the 2000s.

In the first section, the macroeconomic growth performance of developing countries in the recent decade will be presented. Later on, in the second part, our focus will be on the financial transformation happened in developing countries. The third section will be devoted to the global financial crisis, its impacts and

implications on the financial system of developing countries. The last part will explain why a serious financial crisis was not observed in the years 2002-07 in developing countries and also question the reasons behind the relatively moderate performance of developing countries during the global financial crisis.

The groups of developing countries whose data are presented in this chapter are chosen according to the IMF (2012) classification of developing countries. According to IMF, the group of "Emerging and Developing Countries" consists of 150 countries from Albania to Turkey which are in the middle and low income category. The group is constituted exclusive of the 34 advanced economies from the total 184 world economies according to IMF classification, and we summarized the economic and financial data of this group. Also in some places, we use the data of World Development Indicators (World Bank). Countries under the middle and low income country group categories of the data-set of World Bank represent developing countries for this chapter.

3.2 Growth in Developing Countries in the 2000s

In this section, we will analyze the GDP growths and per capita income levels in developing countries in the 2000s. According to the indicators in World Economic Outlook (IMF, 2011), the average GDP growth rate in all developing countries was 6.5% from 2001 to 2008, compared to its level of 3.9% in 1991-1997 period. As Figure 3.1 depicts, the developing world has grown at a greater magnitude and pace than advanced countries. Also the annual GDP growth rate of developing countries as a whole was much greater than the world average growth rate. Also Figure 3.2 indicates the annual GDP growth rates of developing country groups. Among these groups, the largest output increase was observed in Developing Asia and Latin America in 2001-2007. And almost all developing country regions experienced positive GDP growth rates in these years.

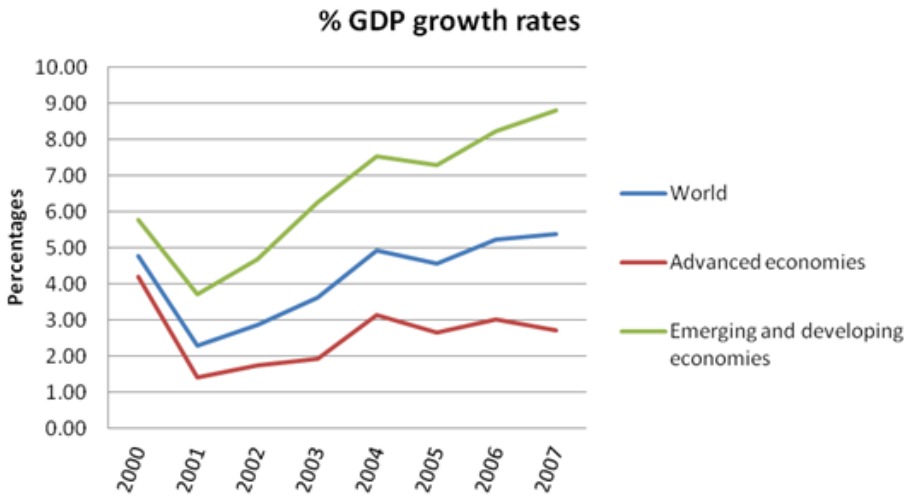
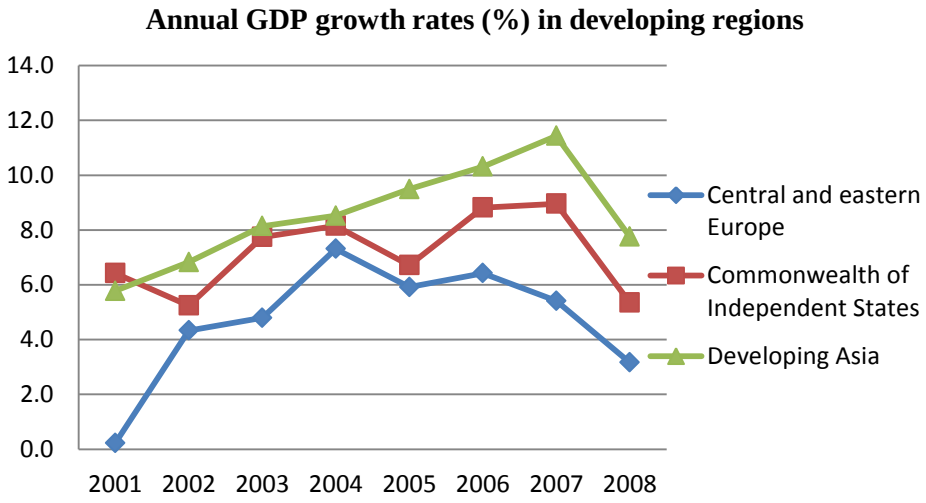


Figure 3.1: Annual GDP growth rates of the world, advanced, emerging and developing economies. Source: WEO

This thriving growth reflected on the per capita GDP in developing countries. Since 1998, the per capita income almost doubled till 2010 (Figure 3.3). And this growth in per capita is much higher than the average world per capita growth. Starting from 1998, the annual world per capita GDP had risen from on average 5000 $ to 6000 $, which means a 20 % improvement (World Bank, 2010).



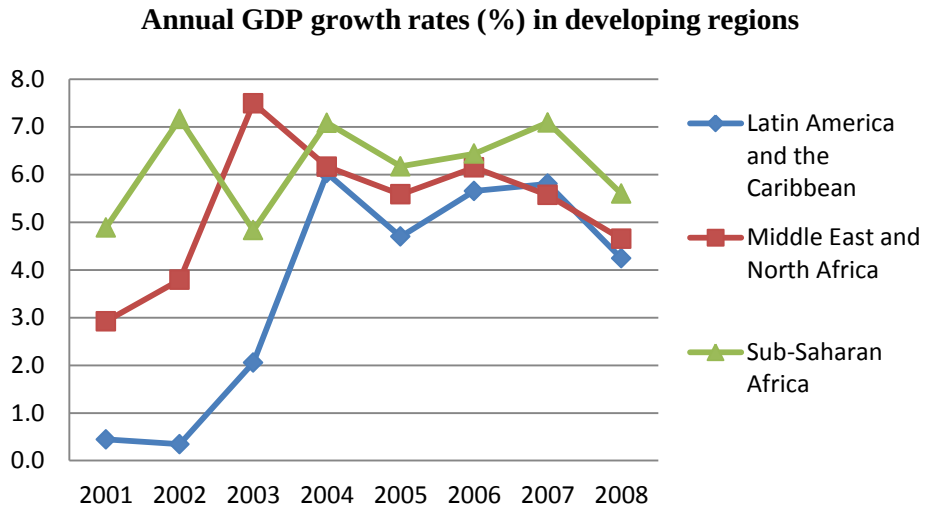


Figure 3.2: Annual GDP growth rates in developing country groups. Source: WEO[13]

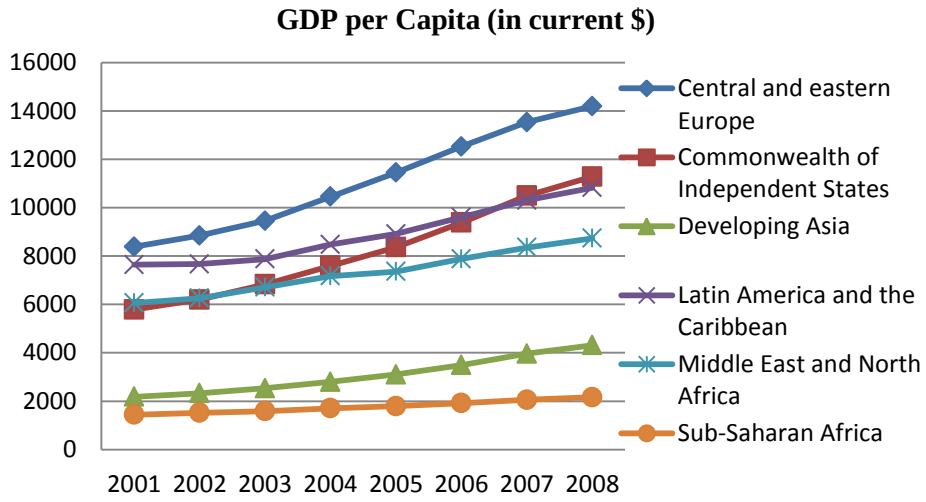


Figure 3.3: GDP per capita values of developing countries. Source: World Development Indicators (WDI)

3.3 Deepening of Financial Markets in Developing Countries

Developing economies' financial system has experienced a big transformation in recent years. Most developing countries liberalized their capital accounts, loosened the controls over financial institutions, and became fully

[13] Commonwealth of Independent States (CIS) consist of the countries in the former Soviet Union. These countries are; Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyz Republic, Moldova, Mongolia, Russia, Tajikistan, Turkmenistan, Ukraine, and Uzbekistan, Georgia and Mongolia (IMF,2012)

integrated with the global financial system with the vast existence of foreign banks in their borders. Financialization was at the peak of historical levels in developing countries in the 2000s. Figure 3.4 indicates the degree of the financial openness in industrial countries, emerging markets and less developed economies. The financial openness in this figure represents the scores of capital account openness (KAOPEN) index prepared by Chinn and Ito (2008), which is a widely used financial integration measure in the literature recently[14]. According to Figure 3.4, capital accounts were increasingly liberalized in emerging markets and less developed countries in the 2000s. The index scores for these two groups in the 1990s were below zero, however; from 2000 onwards the average scores approached to 1.0. Hence, this can be taken as a proof that developing countries integrated with international financial system to a greater extent.

Increasing number of foreign owned banks in developing countries can be seen as another indicator of the process of financial liberalization in these countries. The higher share of external banks in the financial system of a country means an easy access to external funds and greater integration with global financial system. In Figure 3.5, we see the share of the assets held by foreign owned banks in the total assets of the banking system in some developing economies. It is obvious from the figure that the share has substantially increased for the last 15 years in these countries. This indicates that an increasing number of banking institutions and their assets in developing economies are managed by international entrepreneurs and the banking system of these economies integrated with the global financial system to a higher extent.

[14] Althgough there are lots of indexes produced for measuring the financial openness of countries such as Quinn (1997) and Kaminsky and Schumpkler (2003); KAOPEN is the mostly used measure in the literature because it colligates the wide range of financial variables and is calculated for 181 countries. The other measures investigate small number of sample countries. KAOPEN is based on the composition of the variables explained under different categories of IMF's Annual Report on Exchange Arrangements and Exchange Restrictions (ARREAR).

The Degree of Financial Openness by Chinn-Ito Index

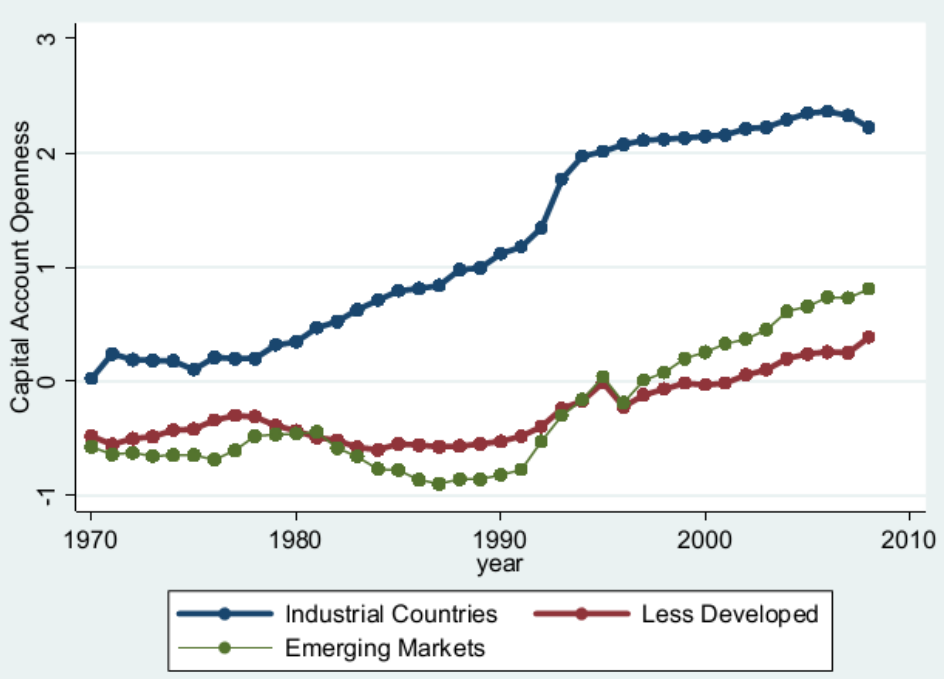


Figure 3.4: Financial openness index scores in country groups.
The maximum score is 2.50 indicating that the most open economy gets the index value of 2.5.
Source: Chinn and Ito (2008)

Assets of foreign-owned banks as a share of total banking system assets

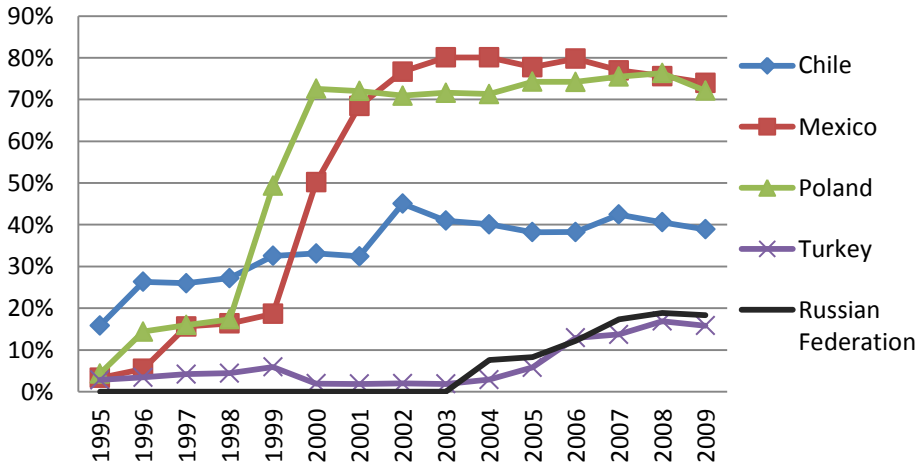


Figure 3.5: The share of assets held by foreign-owned banks in total banking assets.
Source: OECD

The deepening economic and financial integration between emerging and advanced economies has manifested itself in the recent surge in private capital flows from advanced economies to emerging markets (Mihalijek, 2009). In the period of

2002-07, capital inflows to developing countries reached substantial levels. We will depict the recent capital inflow surge in developing countries in this section. Furthermore, these capital inflows at record levels had impacts on the financial markets in developing countries. In this part, we will also look at these domestic monetary implications of the capital inflow surges in developing economies.

3.3.1 Capital Inflows in Developing countries in the 2000s

The most critical aspect of the financial integration of developing countries with the rest of the world is the movement of excessive amount of capital inflows into developing economies. The magnitude of inflows to developing countries has reached substantial levels in the 2000s. And this boom of capital inflows in the 2000s has very different patterns from the ones in the 1980s and 1990s. In the 1970s and 1980s, the capital inflows possessed the role of financing domestic investment by facilitating liquidity for developing country investors. In the 1990s, increasing current account deficits were required to be financed by foreign capital, hence the capital inflows took the role of deficit financing in developing countries in these years. However, particularly after 2002, the amount of capital inflows has been much higher than the amount which emerging market economies actually required in order to finance private investment and their current account deficits.

After the early 2000s, domestic savings exceeded the investments in developing countries, implying that developing countries as a whole do not need external funds to finance their domestic investments. Figure 3.6 depicts this situation initially for the whole developing countries and later developing country regions. Most developing economies' gross domestic savings have been above their investment demand since 2000. This is the case for most developing regions except Central and Eastern Europe, where the gap between saving and investment has been widening since 2000. This may be linked to the excess investment opportunities for these former Soviet countries after they became a part of the European Union.

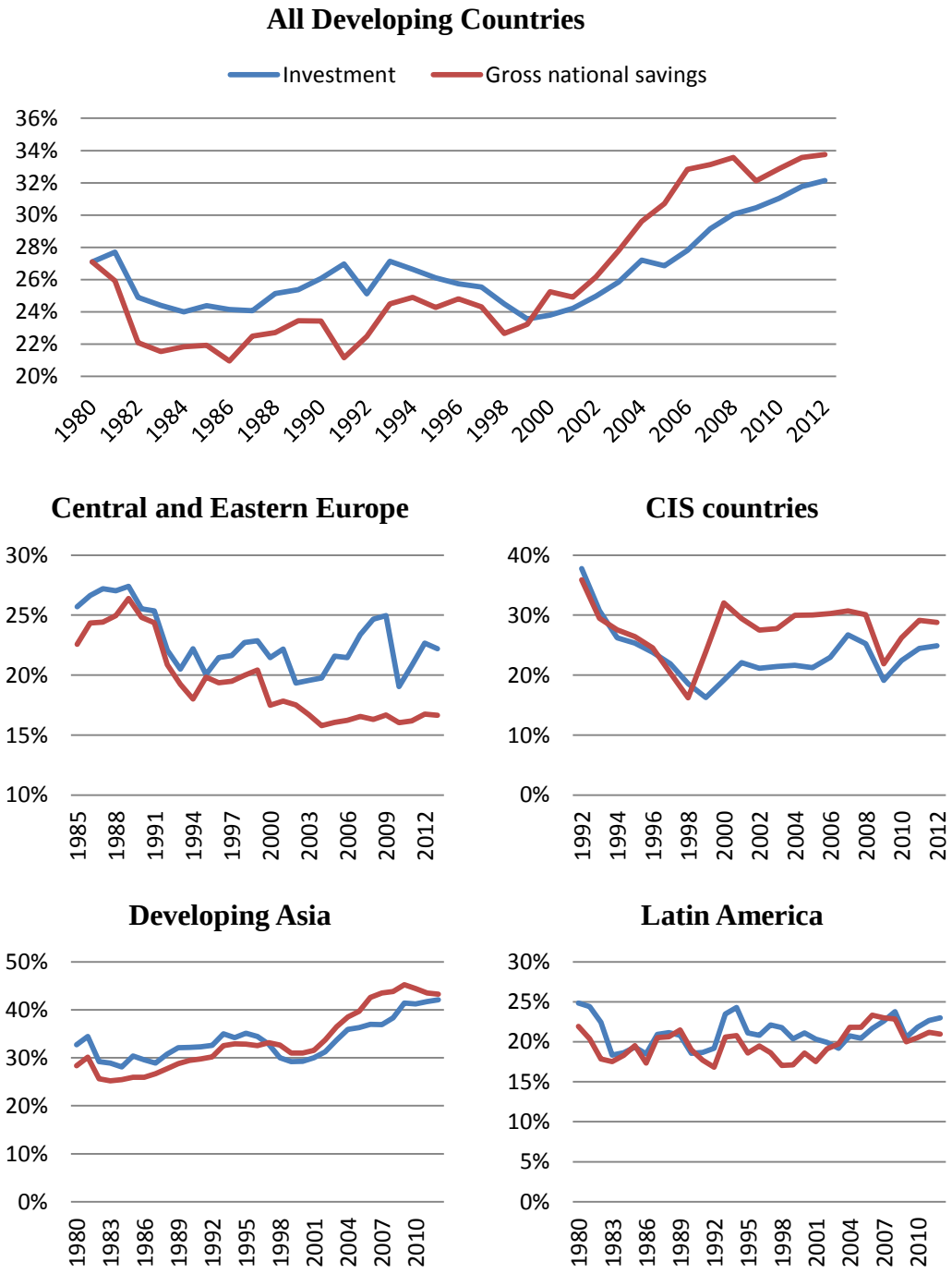


Figure 3.6: The graphs in the figure indicate the gross national savings and investment demand in whole developing countries, and also regional classification of developing economies. The red line is the gross savings and the blue line is the investment. CIS (Common Wealth of Independent States) are the countries of Former Soviet Federation according to IMF classification. Source: World Economic Outlook (WEO)

Furthermore, basic balance of payments identity imply that net capital inflows should cover the current account deficits of an economy, and this was the

main role of capital flows to developing economies in the 1990s. Capital inflows in the 1990s had the role of deficit financing in developing economies. And this was the reason behind the most emerging market crises of these years, because a sudden stop in the capital flows undermined the deficit financing needs of developing countries (Roubini & Setser, 2004). However, if we look at the situation in developing countries in the 2000s, we can see that the level of capital inflows became more than their traditional level to finance the current account deficits. The annual average of the private capital inflows to developing countries as a whole was 200 billion USD in the period of 2002-2006, and the number amounted to 600 billion USD in 2007. These levels were much higher than the required deficit financing needs of developing countries in the recent period because the 2000s have witnessed small deficits or even surpluses in the emerging markets. Figure 3.7 exhibits that, the current account of developing countries, in total, was in deficit and the level of net private capital flows was sufficient to match these deficits in the 1990s. However, since the 2000s, developing economies have had current account surpluses and meanwhile capital inflows in these economies have increased rapidly. As pointed out above, capital inflows didn't have a role of financing current account deficits anymore and this is a new phenomenon for developing countries (Mohan & Kapur, 2009).

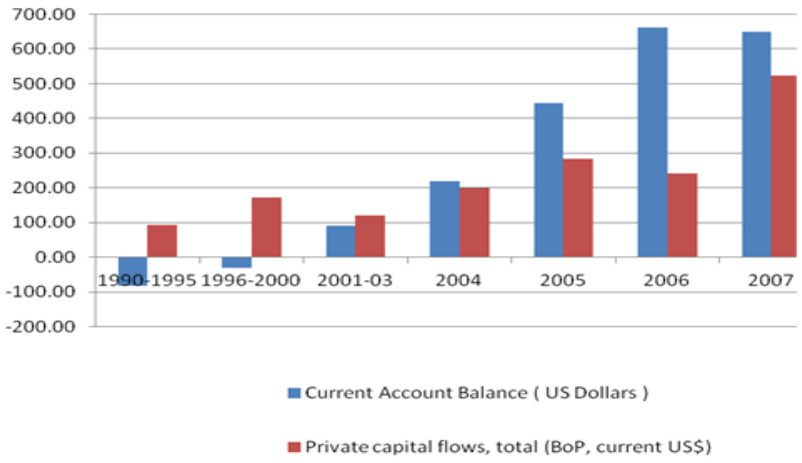


Figure 3.7: Capital inflows and current account balance in developing countries over years. Sources: WDI and IFS

Increasing amounts of capital inflows in developing countries may be observed by looking at the net private capital flows in developing country groups[15]. In the graphs in Figure 3.8, net private capital flows in several developing country groups as a share of their annual GDP are depicted for the 1980s, 90s and 2000s

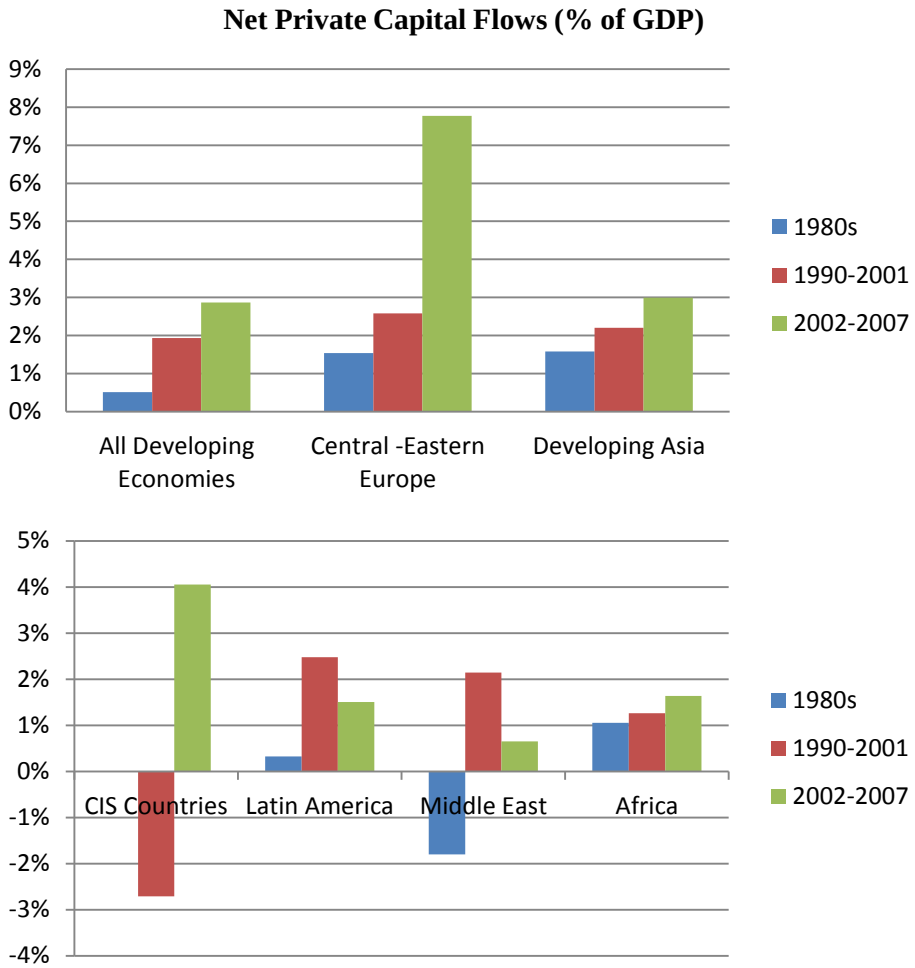


Figure 3.8: Net private capital flows as of GDP in several developing countries and regions. The values in the figure are share of aggregated net flows in the aggregated GDP in the periods represented by columns. Source: WEO

The graphs clearly indicate that net flows have boomed after 2002 in majority of developing regions. Except Latin America and Middle East, net capital flows as a share of GDP in other regions after 2002 are almost twice as much of the 1990s. Furthermore, in Table 3.1, net private capital flows are depicted with annual net inflows and outflows in the regions. According to the table both inflows and

[15] Net private capital flows are equal to private capital inflows by non-residents minus private capital outflows by the residents.

outflows have increased in developing countries in the 2000s and the rise in inflows was greater than the rise in outflows

Table 3.1: Net Private Capital Flows, Inflows and Outflows

Region/Item	2001	2002	2003	2004	2005	2006	2007
Emerging and Developing Economies							
Private capital flows, net	1.1	0.8	2.0	2.5	2.1	1.6	4.0
Inflow	2.6	2.5	5.6	7.5	7.9	10.5	13.9
Outflow	1.6	1.7	3.6	5.0	5.8	8.9	9.9
Africa							
Private capital flows, net	0.3	0.4	0.9	1.8	3.1	3.7	3.0
Inflow	3.3	3.1	3.3	3.6	5.4	7.3	5.7
Outflow	3.0	2.7	2.5	1.8	2.3	3.6	2.6
Central and Eastern Europe							
Private capital flows, net	1.0	4.2	5.5	6.5	8.8	9.4	10.9
Inflow	2.7	4.6	6.9	9.8	10.4	13.7	13.7
Outflow	1.7	0.5	1.4	3.3	1.6	4.3	2.8
CIS countries							
Private capital flows, net	1.6	3.4	3.3	0.3	3.0	4.2	7.5
Inflow	2.7	4.9	8.0	8.1	11.2	12.3	16.7
Outflow	1.0	1.5	4.7	7.7	8.2	8.1	9.2
Developing Asia							
Private capital flows, net	0.8	0.9	2.1	4.1	2.1	0.7	2.8
Inflow	2.4	3.0	7.2	10.2	9.8	11.9	15.9
Outflow	1.6	2.1	5.1	6.1	7.7	11.2	13.1
Middle East							
Private capital flows, net	-0.1	0.0	0.2	-2.1	-5.4	-4.2	0.8
Inflow	-0.5	1.5	4.4	8.0	8.3	20.4	29.7
Outflow	0.6	1.5	4.2	10.2	13.6	24.6	28.9
Latin America							
Private capital flows, net	2.1	0.3	1.0	0.8	1.5	0.3	2.9
Inflow	3.7	1.7	2.9	2.9	3.4	3.4	6.1
Outflow	1.6	1.4	1.8	2.1	1.9	3.0	3.1

Source: WEO and Mohan and Kapur (2009)

Majority of the literature agrees on that the large volume of capital inflows may bring about some risks because of the possibility of a sudden reversal of these flows (Stiglitz, 2000). For this, the composition of capital inflows does matter because some types of flows are easily reversible and volatile and some are less volatile and more stable. Foreign direct investments, among others, are the least volatile flows since they have huge transaction costs and are considered as long-term investments. However, the most volatile component of capital flows is considered to be other flows, which may remain depressed for a few years after a reversal occurs (Levchenko and Mauro, 2006). Other flows are mainly comprised of international bank and private sector loans, trade credits and other credit flows and in times of trouble in an economy primarily the direction of these flows may change. In Figure 3.9, we can see the shares of net other investment inflows in total net capital inflows in the periods of 1990-2000 and 2001-2011 respectively for some major emerging markets[16]. The values in the figure depict the net total amounts of other flows in these two decades.

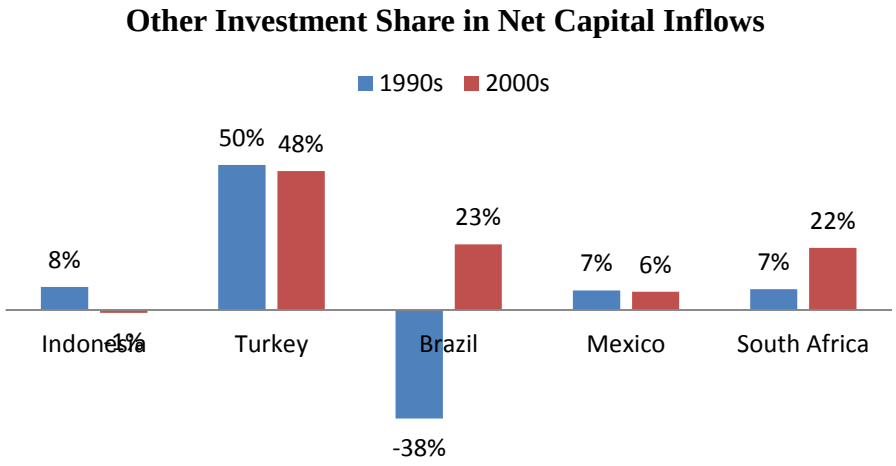


Figure 3.9: The shares of other investment flows in the total net capital inflows in developing countries. The blue labels depict the share of net other investment made in the whole period of 1990-2000 and the red labels depict the same share in the 2001-2011[17]. Source: IFS

[16] Since data of otherflows is not available for country groups, here we present the data for some developing countries.

[17] According to the IMF classification, other flows comprise of international trade credits, loans, currency and deposit transfers.

The share of other flows takes a significant place in Turkey, Brazil and South Africa in the 2000s. Especially in Turkey, half of the capital inflows were constituted by other investment flows. In the 2000s, even if it seems that the share of other flows decreased a little compared to the 1990s in Turkey, other flows actually boomed after 2003 because the 2001 crisis in Turkey led to a sharp cease in these flows for two years. In 2008, the share reached the 70 percent of the net capital inflows in Turkey, which is so difficult to compensate in case of a shock. Furthermore, in Brazil and South Africa the share of other flows was negligible in the 1990s, however; in the 2000s, %23 and %22 percent of total inflows were constituted by other flows respectively in these countries.

3.3.2 The Drivers of the Recent Capital Inflow Surge in Developing Countries in the 2000s

There are several domestic and external factors explaining international capital movements in developing countries. For the time being, we will shortly look at the main factors behind the capital flows to developing countries in the 2000s in order to understand changes in developing countries and in the world, which brought about this increasing volume of flows.

The literature mainly attributes the large volume of capital inflows in developing economies to different factors. Growing degree of financial openness over time and perception of strong growth prospects in developing economies may be attractive factors for international capital (Mohan & Kapur, 2009). We showed developing countries' growth performance in the second section of this chapter. Additionally, the liberalization policies in developing countries in the 1990s and 2000s made international capital freely move in and out of developing countries. In Figure 3.4, we depicted the degree of financial openness in developing countries based on the KAOPEN index. In Figure 3.10, the index scores of different developing country groups by region are presented. It is clear from the figure that capital account openness to the international financial system increased in the most

of the regions in the 2000s except for Developing Asia. The highest increase is observed in Central and Eastern European countries.

The Degree of Capital Account Openness in Developing Regions

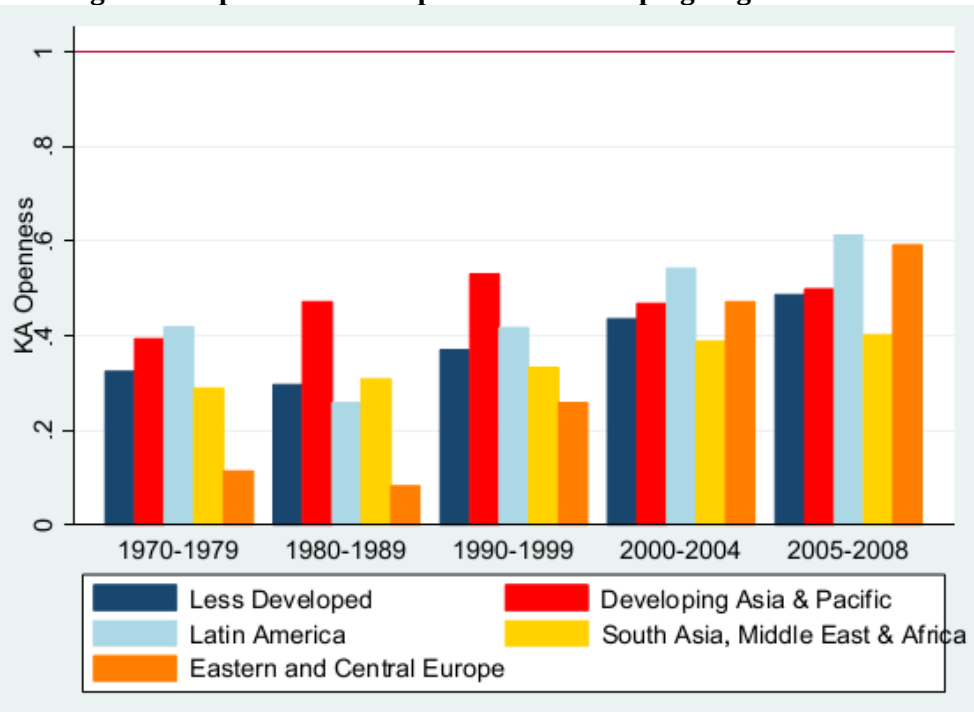


Figure 3.10: The degree of Capital Account Openness (KAOPEN) in different developing regions over time. For this graph differently from figure 8, the maximum score is normalized to 1.0, indicating that the most open economy gets the score 1.0. Also see the footnote 2. Source: Chinn and ITO (2008)

Furthermore positive interest differentials in favor of these economies, decreasing real interest rates in advanced economies and sometimes the expectation of continuing currency appreciation in developing countries may be the other drivers (Mohan & Kapur, 2009). All these factors contributed to financial deepening of developing countries and hence massive capital movements in these countries in the 2000s.

As demonstrated in Figure 3.11, the real interest rates in major advanced countries, decreased significantly after the early 2000s. Decreasing returns in advanced economies led global investors to direct more of their portfolios to developing countries in search for high yield. And since developing countries' financial account was more open and liberalized than the 1980s, the flow of global

capital to developing countries significantly increased in developing countries after the fall in the interest rates in industrial countries.

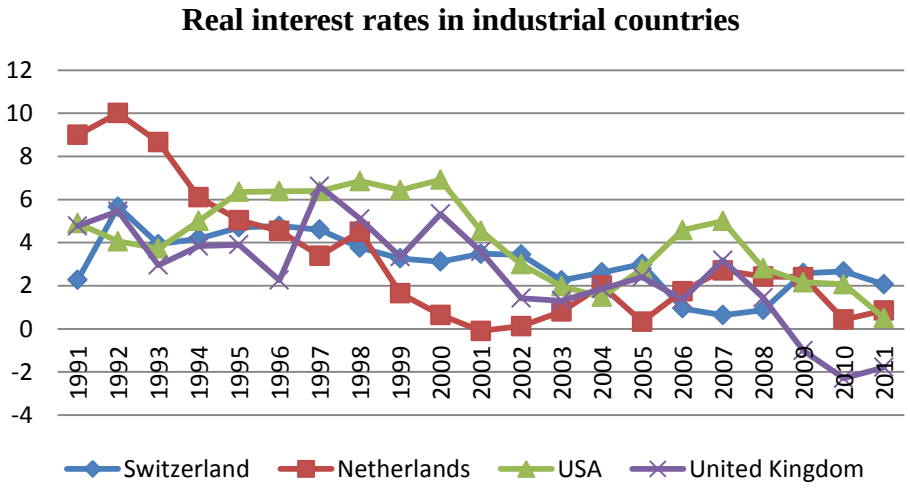


Figure 3.11: Real interest rates in industrial countries in 1991-2011. Real interest rate is calculated as the average lending rate minus the inflation rate calculated via GDP deflator. Source: WDI

Besides the sharp declines in industrial country yields, the currencies of most developing economies appreciated in real terms in the 2000s. Continuing real appreciation led to more appreciation expectations in this period. Because the real appreciation of currencies heightens the arbitrage opportunities for global investors, more and more international capital continued to move into developing economies[18]. Figure 3.12 demonstrate that in Brazil, Turkey and Indonesia, there was a substantial real currency appreciation. In ten years, the overall appreciation was about nearly 50 percent in these economies. This may be a significant source for capital inflows to these countries. In Mexico, the peso appreciated at a great pace after the 1994 Tequila crisis. After 2001, we observe a small depreciation, however; later on peso appreciated slowly. South Africa experienced a great real appreciation after 2001 but from 2006 the exchange rate became volatile and depreciation occurred for two years. This may be tied to the impacts of global financial crisis.

[18] If you invest your money in an appreciating currency, you will get returns from exchange rate differentials even if you don't earn interest income.

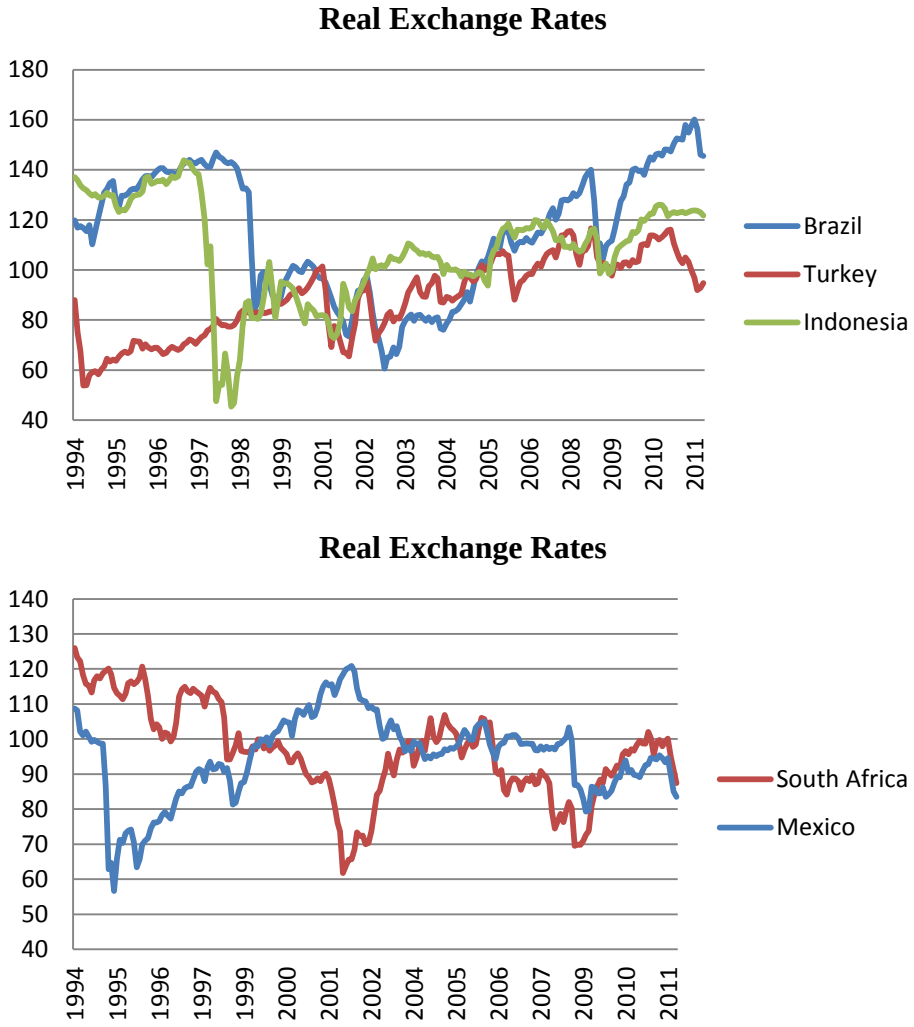


Figure 3.12: Real effective exchange rate movements in developing countries over time. The 2005 rate is indexed to 100. Increasing values indicate an appreciation. Source: BIS

3.3.3 Domestic Implications of Financial Integration and Capital Inflows in the 2000s

High degrees of openness in the financial accounts and large capital inflows in developing countries have had impacts on domestic monetary system of developing countries in the 2000s. Capital inflows have led to large domestic liquidity in developing countries. For example, after the late 1990s, M2 money supply as a share of the GDP has substantially increased in developing country regions (Figure 3.13), pointing out the fact that domestic liquidity soared in these economies.

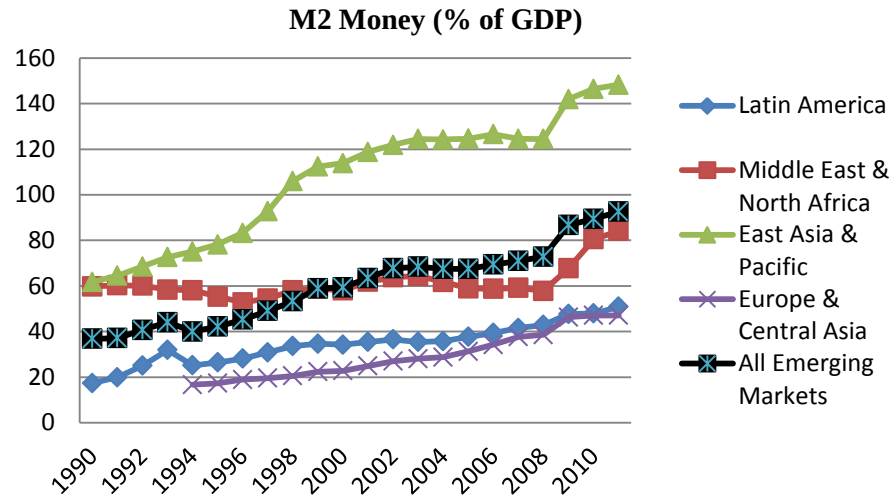


Figure 3.13: Total Money and Quasi Money (M2) as a share of GDP in developing country groups. Source: WDI

Excess liquidity mostly sourced by external flows led the banking sector in these economies to issue high amounts of credits to the public and private sector. Hence, after the 2000s most developing economies experienced credit expansions at considerable levels. Figure 3.14 demonstrates that, in most of emerging markets, domestic credits grew at significant rates after the late 1990s.

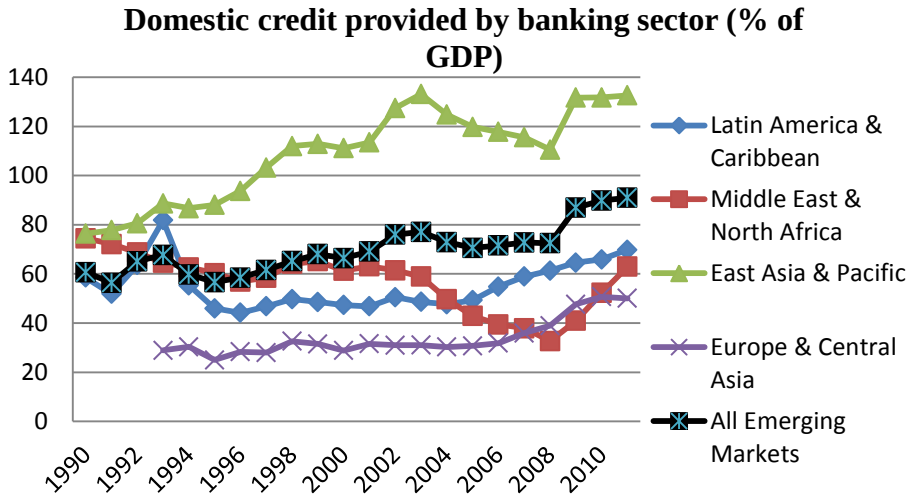


Figure 3.14: Domestic credit provided by the banking sector in developing economies. The numbers indicate the share in the GDP. Source: WDI

Excess liquidity in developing economies, which is caused by capital inflows, has another domestic economy implication. This is the asset price booms, which

occur when the price of financial assets much exceed its average price. In figure 3.15, we clearly observe that stock price indexes in developing countries in 2010 were five or six times greater than the prices in the 1990s.

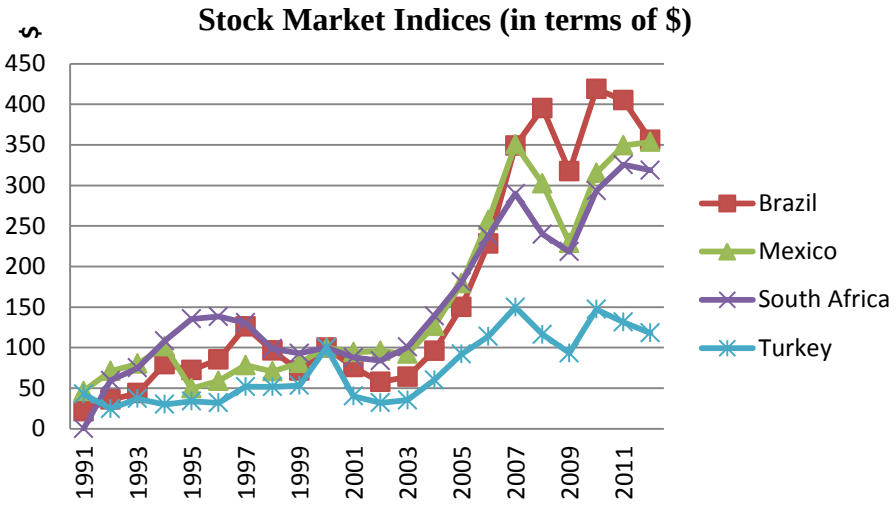


Figure 3.15: Local equity market indexes valued at USD terms. The prices are indexed at 100 in 2000. Source: WDI

We showed so far that developing economies have financially more integrated with the world in the 2000s than in the previous decades. This has manifested itself in the excessive surge of capital inflows into developing countries in 2002-2008. Also, in these years developing countries did not experience a significant financial shock or crisis. However, after 2008, the global financial crisis which hit initially advanced countries has affected developing countries. In the following section, we will discuss the repercussions of the global crisis in developing countries.

3.4 Impact of Global Financial Crisis on Developing Countries

In this part, our focus will be on the performance of developing countries during the recent global financial crisis which is the hardest crisis shaken the world since the Great Depression. 2007 summer witnessed the collapse of the US sub-prime mortgage market, and it was the kick-off of the coming debacle. In a short time, its impacts spread out to whole advanced countries; and Europe, Japan and the

US encountered massive financial and real sector troubles. Nevertheless, the indicators of the crisis exhibited that the circumstances in the developing countries were not as fearful as the developed side. Some developing countries were severely impacted by the crisis but the overall impact on developing economies was not as distressful as the industrial world experienced. This was the 'decoupling' of the developing countries from the strong economies with higher growth rates emanating from higher domestic demand in the former.

The figure 3.16 shows the average GDP growth rates of the world, advanced and developing economies since 2005. Even if during the crisis there was a parallel movement in all country groups, all groups faced a decline in their growth rates compared to pre-crisis years. During the crisis, the growth rate in developing countries was higher than the industrial countries and the world average. The year 2008 was the start of the recession for the most of the developed countries. They experienced on average 0.22 percent growth in 2008 and minus 3.4 percent growth rate on average in 2009, which means a significant recession for industrial countries. As it was the case in pre-crisis years, the average growth rate in developing countries was still above the world average and much higher than the advanced country growth in years 2007 and 2008.

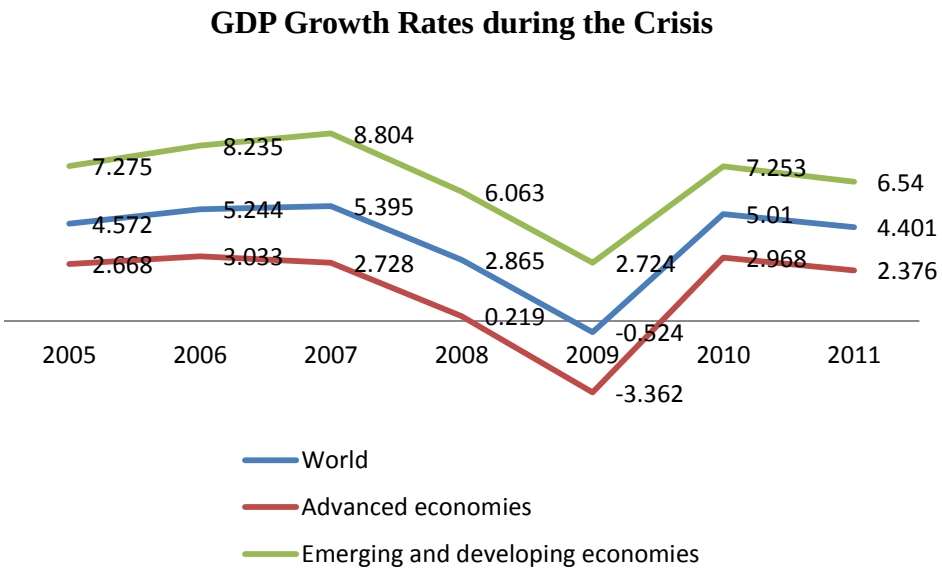


Figure 3.16: Real GDP growth rates of country groups and the world, Source: WEO

The worst effects of the crisis to developing countries were observed in the last quarter of 2008 and the 1st quarter of 2009 due to the contagion impact from advanced countries. Nevertheless, with the exception of the Central and Eastern Europe, Commonwealth of Independent States and Mexico[19], the overall growth of the developing world never became negative. The hardest period was the year 2009 with 2.7% growth rate for developing countries.

Furthermore, developing countries recovered in a shorter time than developed countries from the crisis. An IMF (2010) report on the global financial crisis states that: "Recovery from the crisis was faster in emerging markets that gave a bigger fiscal stimulus, had stronger pre-crisis fundamentals, and had faster growing trading partners" (p.2). Even though developing countries got over the crisis better and improved faster, they felt the crisis in some negative ways. Now, we will discuss how the crisis of the US is transmitted to developing world.

To the experts, the recent crisis was transmitted from the U.S. to the rest of the world through mainly three channels: Banking failures and financial market collapse, decline in export revenues and remittances (trade channel) and the capital inflow reversals (financial channel) (Naude, 2009). The major economies were hit by all these three shocks but developing countries were mostly impacted by the last two factors. The effect of the first factor on a country mainly depends on the financial integration of the country with the rest of the world, particularly the US. Furthermore, the extent to which countries hold assets contaminated by subprime mortgages, the presence of foreign-owned banks and the degree of supervision and regulation of financial sector in a developing country determine the level of impacts of the crisis on this country (Naude, 2009). Since developed countries' financial sectors are highly integrated with the world and lax supervision policies in these countries in the recent years led to severe and systematic financial collapses and bank failures in developed world.

However, many developing countries were not much affected through this channel due to their low exposure to US subprime loans and securities (Goldstein & Xie, 2009). Also the robust financial and macroeconomic policies in developing

[19] The hardest hit countries are CEE, CIS and Mexico with -4,3%, -7,5% and -6,8% respective growth rates in 2009. Developing Asia including China was the least affected region by the crisis with 6,5% growth on average.

countries since the last depressions of 1990s prevented them from encountering any classical type of financial sector bust which they were accustomed to in 1980 and 90s. The financial collapses take relatively higher place in the Central and Eastern European (CEE) countries and Commonwealth of Independent States (CIS), since their financial sector is tightly linked to European economies this explains why their recession was worse than other developing regions[20] (Aizenman & Hutchison, 2011).

3.4.1 Trade Channel

As explained above, the crisis did not hit developing countries through the collapses in financial sector to a great extent. The crisis spread developing countries through the contractions in real sector and halts in external capital inflows. The sharp decline in the export volume due to decreasing demand in the rest of the world was the first factor in the real sector contraction. Figure 3.17 exhibits the change in the export volumes in emerging markets, advanced countries and in the world since 2005. As clearly observed from the graph, starting from 2007, the annual growth rate of developing countries' export volume decreased from 9.5% to -7.5%. This means a very sharp decline in the exports of developing countries. However, from this figure, we may claim that developing economies were relatively less influenced by the trade channel than the industrial countries, because the contraction of exports in industrial countries was %12 in 2009. Industrial countries' trade was more severely influenced by the crisis.

[20] In a similar way, the negative growth rate of Mexico during the crisis could be associated with the high integration with U.S. financial market and dominating presence of foreign-owned banks in the country. The minimal effect of the crisis on China could be attributed to the government ownership of the most banks in the country.

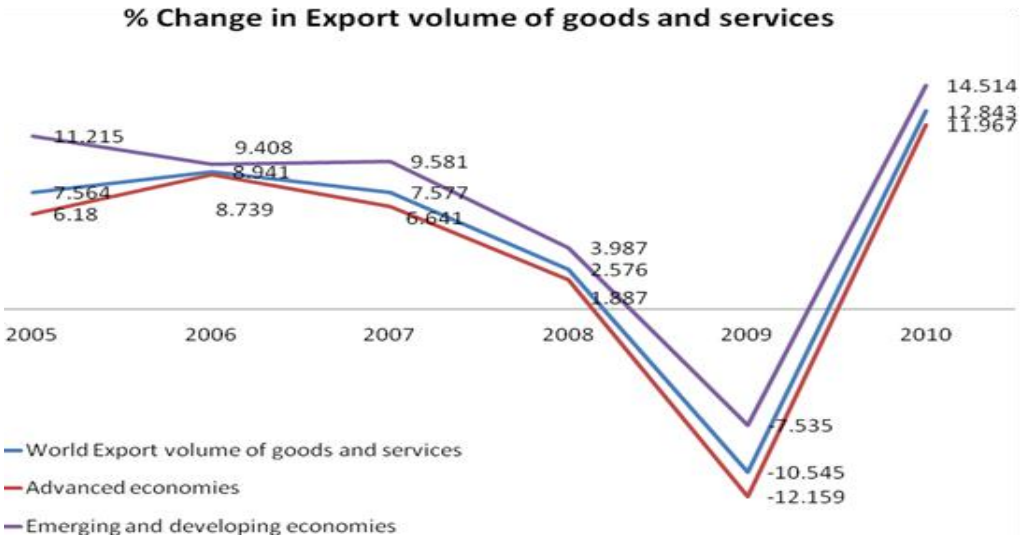


Figure 3.17: Annual percentage change in the export volume of different country groups in 2005-2010. Source: WEO

Nevertheless, all developing countries were not affected equally by the trade channel and the impact depends on the trade openness, types of export goods and the situations in the trade partners of the exporters. Especially the countries exporting primary goods and having a non-differentiated export sector were severely affected by this channel. Furthermore, the destruction in the export revenues in crisis-hit countries was also caused by the decreases in commodity prices. Declines in commodity prices are detrimental to the export earnings of a large number of countries (Eichengreen, 2010). Specifically North Africa and Middle Eastern economies, which are dependent on oil-exports, were affected drastically by the sharp decline in oil prices. Figure 3.18 demonstrates the current account balances of developing country regions. It is clear that the worst current account deterioration is observed in Middle East, North African and Sub-Saharan African regions, due to their high dependence on primary goods exports. Current account situation in Central and Eastern Europe seem improved in 2009. This may have happened because these economies experienced the highest contraction in GDP, and the imports have declined sharply in these regions due to the high GDP contraction. The fall in imports was greater than the fall in exports in Central and Eastern Europe; hence developing countries in this region experienced a current account improvement during the crisis.

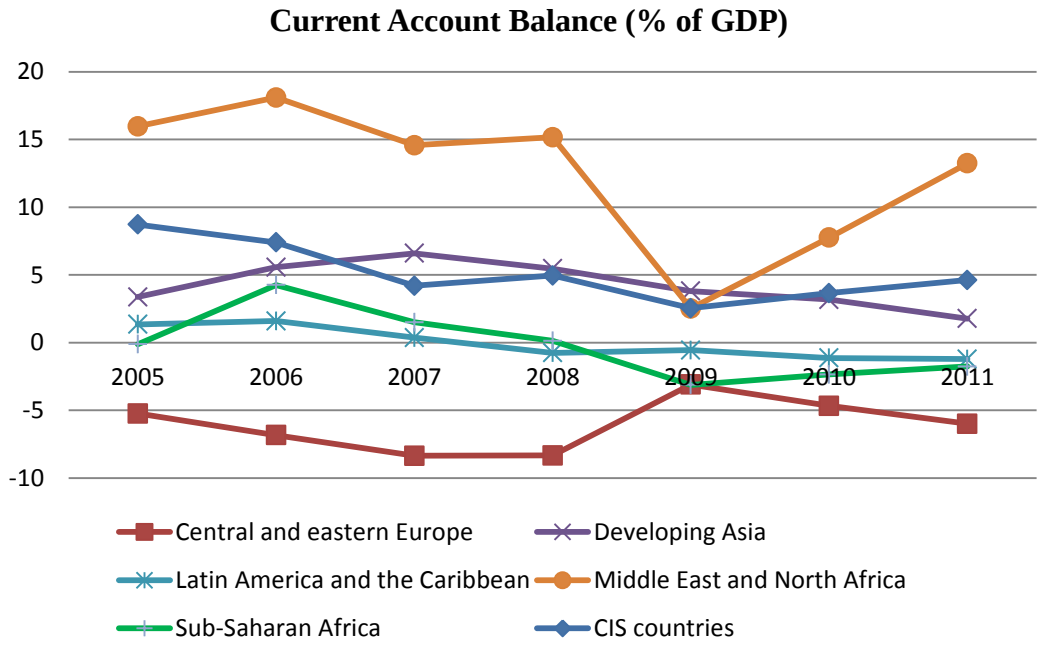


Figure 3.18: Current Account Balance as of GDP in developing country regions. Source: WEO

3.4.2 Financial Channel

The last channel through which the crisis was transmitted to emerging and developing markets was the sudden stop in the capital inflows which happened mostly in 2008 and 2009. After the post Lehman Brothers panic in September 2008, due to a negative wealth effect in advanced nations and an increasing uncertainty of the asset prices led to a decline in the availability of capital for developing countries and as a result foreign capital contraction worsened after late 2008 (Didier & Schumkler, 2011). Figure 3.19 presents the changes in net capital inflows to some developing regions. We clearly observe that after the start of the crisis in 2007, the capital inflows began to fall. The ratio of net private capital flows to GDP fell from 4.5 percent to 1.5 percent in developing economies as a whole. The biggest contraction was observed in the CEE and CIS countries with on average a 10 percent collapse in capital inflows. The fundamental reason for this collapse is the high integration of Central and Eastern European countries with the other industrial European countries and also similar high interaction between Commonwealth of Independent States and Russia. Latin American countries did not encounter a huge

decline in capital flows and developing Asia recovered in a short time in 2009 after a 2% decline in 2008.

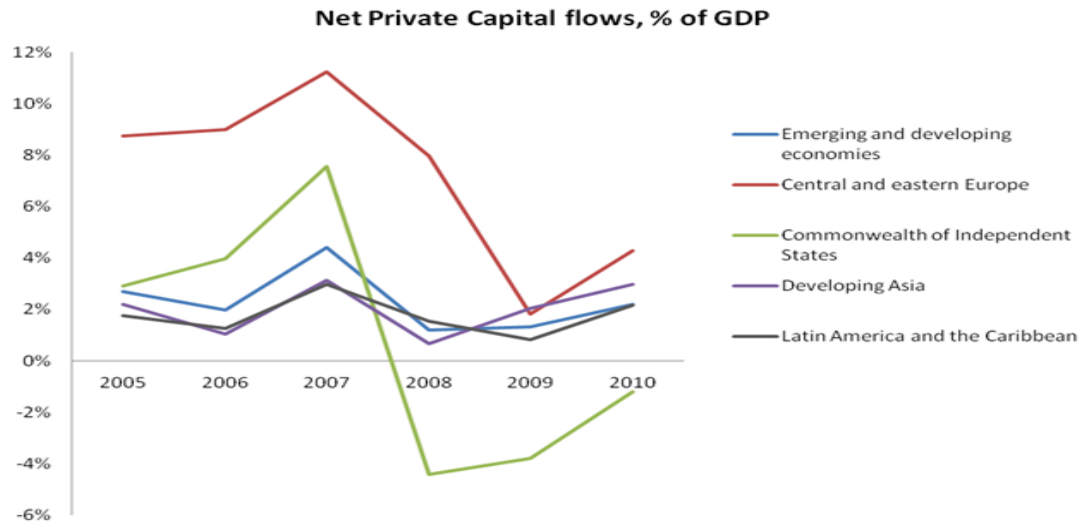


Figure 3.19:The trend of the net private capital flows in developing regions in 2005-2010. Net private capital flows are equal to total capital inflows by non-residents minus total capital outflows by residents. Source: WEO

As we mentioned previously, developing countries were affected by the crisis less severely than the advanced countries. The degree of impact varies among the developing country groups as well. The Figure 3.20 indicates the real GDP growth rates among the different regions of the developing world. From the figure, we see that the worst affected regions are Central and Eastern Europe and CIS countries. We stated above that these two regions were hit principally by the financial channel and they experienced large capital reversals (Figure 3.19). Worsening of the current account was not much observed in these regions in the crisis. The second graph in the Figure 3.20 indicates the relatively less affected regions. The interesting point is that Middle East, North and Sub-Saharan African regions are hit hardest by the trade channel but these regions in general fared the crisis better than other regions. Also note that the largest contraction in the volume of exports was observed in Developing Asia but this region was the least affected country in terms of GDP growth.

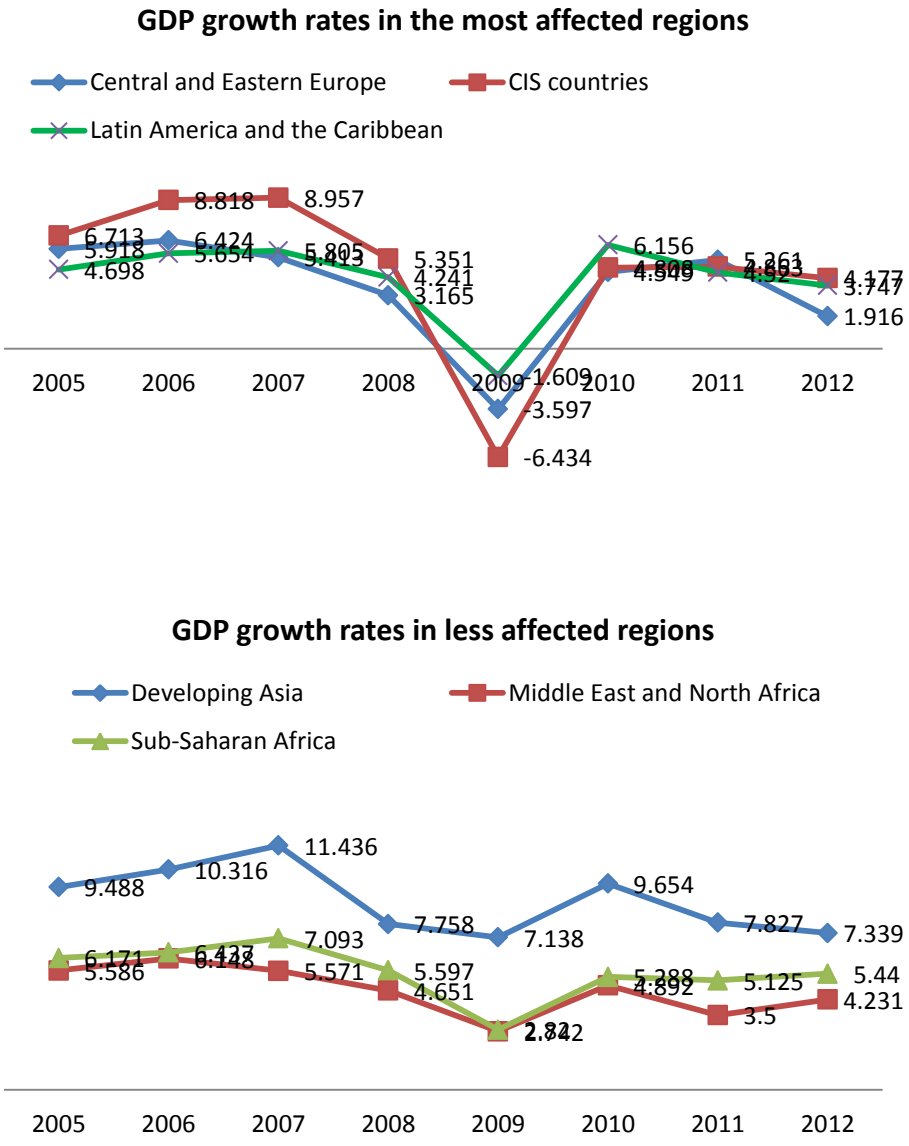


Figure 3.20: Real GDP growth rates in developing regions during the global financial crisis. Source: WEO

Hence the significant interpretation is that the effect of the financial channel is harder and more destructive than the export channel for developing countries. Examples are Middle East and North Africa nations are the toughest affected by the export channel but their average GDP didn't fall into recession. Whereas, CEE and CIS nations were mainly hit by the capital reversals and their GDP contracted on average 3,5% and 6% respectively. One may conclude from this picture that the shocks coming from the financial accounts have greater devastating impacts than the shocks from the current account in developing economies.

So far in this chapter, we tried to take a picture of developing countries in the 2000s. We showed that excessive financial liberalization policies in developing countries have led to large capital inflows into developing countries. And these excess flows brought about high liquidity in the domestic financial systems of developing countries. Also in the years 2002-2007, developing countries did not witness a major financial crisis, which was observed in the 1990s in many occasions. After that, we presented the impacts of the global financial crisis on developing countries. We concluded that even though the crisis was very influential in emerging markets, it was not as severe as advanced countries experienced. We may interpret from the analysis above that developing economy financial systems have been relatively calm and stable in the 2000s. In the following section we will investigate the factors of this calmness in developing countries.

3.5 The Reasons behind the Financial Stability of Developing Economies in the 2000s

Experiences from the past crises episodes of the 1980s and 1990s, and the empirical research have shown that the pronounced financial integration carries huge risks and any kind of a speculative attack would destroy the economy. Obstfeld (2009) mentions this issue as well; "After the Asian debacle of 1997–98, prominent critics of financial globalization argued that its benefits were intangible and undocumented, whereas its risks were enormous and real" (p.1). Furthermore, we indicated in above parts that financial liberalization and capital inflows in developing economies in the 2000s have been at record levels. Nevertheless, no financial crisis was observed in developing countries from 2002 to 2007. The crucial question is, while the years 1980-2000 have witnessed lots of currency and financial crises and its terrible outcomes in the emerging markets, how did this situation turn out to be that developing countries did not face a financial crisis in 2001-2007 despite the higher integration of developing countries with the world in this period? In this part, the answers of the existing literature to this question will be elaborated on. Furthermore, we stated that developing countries were performed better than the industrial world during the global crisis. The calamities of the crisis were not as

catastrophic as the past developing country crises happened in the 1990s. In this section, we will also present the explanation of the literature on the relatively moderate performance of the developing world in the global financial crisis.

The literature has three prior explanations for the stability obtained in the financial systems of developing countries in the recent decade. These are current account surpluses or small deficits in majority of developing economies, huge amount of reserve accumulation in their central banks and prevalent use of floating exchange rate regimes in developing countries in the 2000s. Obstfeld (2009) emphasizes the two of these factors in explaining the financial stability of developing countries in the 2000s:

> First, countries running current account surpluses or small deficits do not have a big external borrowing need that may suddenly be denied by a capital-market reversal. Second, a high reserve level provides a cushion of ready liquidity in a crisis (p.6).

As explained above, after the Asian Crisis in 1997-98, export revenues increased largely and this is due to trade liberalization policies in developing countries, inexpensive production capacities in emerging markets, high commodity prices in the world and increasing demand from advanced economies. Higher exports yielded surpluses or slight deficits in the current accounts of the developing world. Between 2002 and 2007, annual average current account surplus of developing countries was $ 366.5 billion, which was equivalent to the 3.4 percent of the GDP in the developing world (Figure 3.21). This lucrative position implies developing countries didn't need external borrowing to finance their net current account balance. This further indicates that any swings or reversals in capital flows to developing countries would not affect external financing of the foreign trade in emerging economies. Hence, even capital account reversals might not have had serious impact on the trade sector in emerging markets.

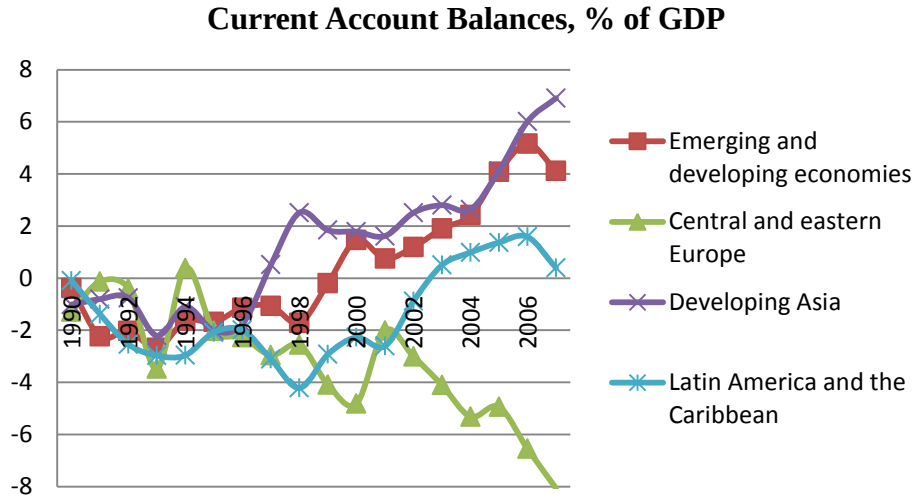


Figure 3.21: Current account balance as of GDP of the developing country groups in 1990-2007. Source: WEO

The large amounts of accumulated reserves in the 2000s are considered to be another reason behind the resilience of developing countries to financial crises in 2002-07. For some economists, the large amounts of international reserves prevented developing countries from speculative attacks. The crises which hit the South Asia, Turkey, Argentina and several other emerging markets in the late 1990s and early 2000s, forced developing countries to accumulate high reserves as a precaution against any kind of reversal in capital flows. According to the literature, foreign exchange reserves play the role of a cushion against any kind of financial turmoil in case of "sudden stops" or "capital reversals (Aizenman & Marion, 2003; Cruz & Walters, 2008). If foreign investors perceive a risk and flee the country, the central bank reserves may meet the demand for foreign exchanges. Total reserves held by developing countries rose by almost $3 trillion since 2001 and reached $6 trillion in 2008. And while, in 1990, Foreign Exchange Reserve / GDP ratio in the whole developing world was 5%, the ratio in 2009 became % 30, which means a six-fold increase (Figure 3.22). This enormous amount of reserve accumulation in developing countries could be an insurance against the sudden reversals or debt-repayment needs and played an important role in crisis prevention in developing countries in 2002-07 periods. Jeanne (2007) notes that; "With international reserves four times as large, in terms of their GDP, as in the early 1990s, emerging market

countries seem more protected than ever against shocks to their current and capital accounts." (p.1). Policymakers in developing countries also regarded their high reserves as an effective shock absorber in the 2000s. For example the president of Central Bank of Turkey, Erdem Bascı (2011) stated that: Turkey has accumulated reserves worth of 73.3 billion USD since 2002 and in the developing countries similar to Turkey, such a strong reserve positions had great contributions to removing the negative impacts of both domestic and external shocks and increasing the confidence in these economies.

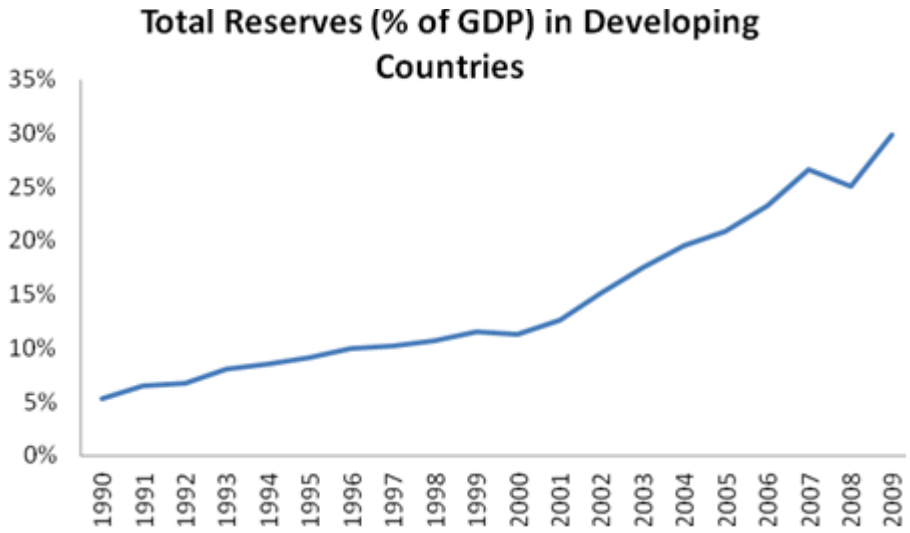


Figure 3.22: The trend in the total reserves / GDP ratio in developing countries. Source: WDI (World Bank, 2011)

Hence foreign exchange reserve gluts are seen as the effective tool in eliminating financial shocks in the 2000s in developing countries, according to both economists and policymakers.

Lastly, removing the fixed exchange rates and widespread use of floating exchange rate regimes among developing countries is assumed, among economists, to be another factor explaining why no emerging-market currency crisis occurred in the 2002-07. Figure 3.23 depicts the changes in the exchange rate regimes used in developing countries since 1990. It is clear from the figure that the number of developing countries using the floating exchange rate regime in 2004 is much higher

than the amounts in 1991 and 1999. Also the number is stable for hard pegs and substantially declined for the intermediate regimes. So in the 2000s, the flexible exchange rate regimes have been applied by the majority of developing countries.

The widespread use of flexible exchange rates is considered to be an influential tool in absorbing the financial shocks in the 2000s in developing countries by the experts. As Krugman (2000) and Ertürk (2004) address, the prominent cause of a financial crisis is the sudden devaluation risk and hence the irrational herd behavior of investors under pegged or fixed exchange regimes. Since under floating rates, the markets automatically adjusts its rate according to the supply of and demand for foreign exchange, any future risks are reflected in the current rate and so sudden and sharp devaluation risk is eliminated. Flexible rates were believed to protect countries from self-fulfilling banking and currency runs (Chang & Velasco, 1999 & Allen, 2002). Flexible rate protects central banks from depletion of reserves and, to most of the economists in literature; it was another reason why no crisis episodes occurred in 2002-07 period in developing states.

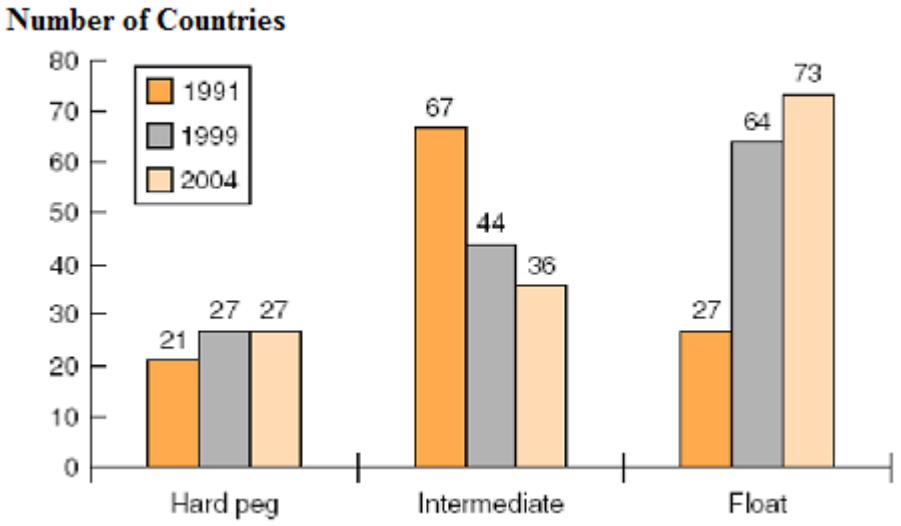


Figure 3.23: The number of developing countries using the different exchange rate regimes in 1991, 1999 and 2004. Source: Worldbank (2007)

In addition, some experts and authorities argue that the large accumulated foreign exchange reserves and flexible exchange rate regimes helped developing countries curb the impacts of global financial crises. Berkmen, Gelos, Rennhack, and Walsh (2011) concluded from their cross-country study of the impact of the global financial crisis that exchange rate flexibility helped in buffering the impact of the shocks. Also an IMF report (2010) investigating the impacts of the crisis claimed that the reserve holdings were effective in protecting emerging markets from the sharp rise in global risk aversion. Developing country central bankers have also appreciated the flexible exchange rates and high foreign exchange reserves in curbing the effects of global crisis. For example, the president of Central Bank of Brazil stated in a conference that Brazil has weathered the storm of the global crisis due to the use flexible exchange rate regime in their country (Meirelles, 2009). The current president of the Central Bank of Turkey, Erdem Başcı (2011) have also noted that foreign exchange reserves of Turkey and other developing countries helped them survive from the crisis.

The overall interpretation from the analysis in this section is that developing economies were financially in a sound position in 2002-07 and they were better equipped to handle the global financial crisis than advanced countries. The authorities and economists link this stable atmosphere in developing countries principally to large amounts of international reserves accumulated by the central banks of developing countries, widespread implementation of flexible exchange rate regimes and current account surpluses or small deficits obtained in developing countries.

3.6 Conclusion

This chapter dealt with the transformation which was observed in developing countries in the 2000s after the serial financial crises of the 1990s. We indicated that in real economy, growth was prosperous, per capita GDP has increased and current account situation has improved in developing countries in these years. Further we showed that in the 2000s, financial accounts were so open to the international financial markets that excessive foreign capitals flowed into developing countries.

However, even though large capital inflows are referred as a risk factor by many, no considerable currency or banking crises were observed in developing countries in the years between 2002 and 2007. Significant shocks to emerging markets were observed only during the global financial crisis.

If we look at the reasons for the financial stability period in the 2000s, policy-makers and many economists agree on the shock absorber roles of widespread usage of flexible exchange rate regimes and high accumulated international reserves in developing economies in the recent decade. Similarly, the experts appreciated the reserves and flexible exchange rates for the relatively better performance of the developing countries during the global crisis than the past developing country crises episodes of the 1980s and 1990s.

This chapter's main aim was to draw a picture of the developing countries in the 2000s and the majority belief of the literature on the stable years of developing countries. The belief of the literature is high reserves and flexible exchange rates were main factors of the stability years. Now, in the following chapter we will question this argument in detail.

CHAPTER 4

POSSIBILITY OF FINANCIAL CRISES IN DEVELOPING COUNTRIES UNDER FLEXIBLE EXCHANGE RATE REGIMES WITH LARGE INTERNATIONAL RESERVES

4.1 Introduction

Developing countries have used various exchange rate regimes so far. In the Bretton Woods era, all economies pegged their currencies to dollar. After the collapse of Bretton Woods, the most of developing countries have continued to use fixed exchange rate regimes. The currencies were pegged to major currencies, like the US dollar or German mark or other pegged regimes were used such as soft pegs, crawling pegs or currency anchors[21]. In the past, it was believed that fixed exchange rate regimes were the best practice for emerging markets. Since the exchange rate fluctuations and uncertainties are eliminated, fixed regimes were assumed to protect countries from trade deteriorations stemming from the exchange rate volatility. Also pegging to low-inflation currencies were believed to smooth domestic inflation pressures. These are the benefits proposed by the supporters of fixed regimes.

However, in chapter two under three generations of crises models, we showed that the successive currency collapses in the 1990s, like ERM crisis in 1992, Mexican peso collapse in 1994, Asian Financial crises of 1997-98, Turkish financial crisis in 2001 and Argentina's peso collapse in 2002 led to seriously questioning the sustainability of fixed regimes. The financial crises of developing countries

[21] As stated previously in the introduction chapter, in this thesis, fixed exchange rates refer to currency boards, conventional fixed peg arrangements, pegged exchange rates with horizontal bands and crawling pegs regimes. Flexible exchange rates in this thesis refer to the free floating or managed floating de facto regimes classified by the IMF (2006). Managed floating exchange rate regimes do not determine an early path for the rate and want to control the large fluctuations in the rate implicitly. Hence managed floating regimes may be considered as de jure flexible exchange rate regimes.

particularly in the 1990s are associated mainly with the rigidity of exchange regimes (Rogoff, Mody, Brooks, Oomes & Husain, 2003). Many experts claimed that a long-standing pegged regime will face, inevitably, a speculative attack, which would undermine the peg and result in financial and macroeconomic crises. Obstfeld and Rogoff (1995) give a perfect description: "Many countries have labored hard and long to make an exchange rate peg credible, only to watch their efforts crushed by market pressure in days or even hours" (p.6). Obstfeld and Rogoff (1995) found evidence that only very small and handful economies have continuously maintained tightly fixed exchange rate regimes for five years or more. Mainstream three generations models of financial crises, which we clarified in the second chapter, emphasized that fixed exchange rate regimes together with low levels of reserves are main factors behind the crises of the 1980s and 90s. Pegged exchange rate regimes were blamed in the way that they invite speculative attacks against the exchange rate, and they are subject to higher incidence of banking crises (Chang & Velasco, 2001; Husain, Mody & Rogoff, 2005)[22]. And since countries did not hold sufficient amounts of reserves, they could not defend the peg and their currencies collapsed as a result.

After all these collapses of fixed currencies, we demonstrated (in the 3rd chapter) that the majority of emerging markets chose to use flexible exchange rate regimes together with excessive international reserves accumulation since the 2000s. In this way, policymakers and economists believe that emerging markets would become defensive against self-fulfilling speculative attacks, large currency devaluations and associated financial crises. Furthermore, we showed in chapter three that in the 2000s, emerging markets' economic performance was sound, their banking systems were strong and only a few financial crises occurred in developing countries in these years. Also we mentioned that developing country's performance during the global financial crisis was moderate and their recovery from the crisis was faster. Many policymakers and economists appreciated flexible exchange rate regimes for the prosperous and non-crisis years of developing economies in these years. For example, in 2009, the president of Central Bank of Brazil, Henrique

[22] Also, In the newspapers and magazines, fixed regimes were blamed especially after the Asian crisis in 1998. For example, the title of an article published in New York Times in the March 1999 was: "Beware of Fixed Exchange Rates and Currency Pegs" (Roche, 1999).

Meirelles (2009), noted in the celebration of 10th anniversary of floating the Brazilian Real[23]:

> The floating exchange rate regime has weathered many storms, starting with the bursting of high tech bubble in 2000, the Argentine crisis in 2001, the September 11th attacks and, recently, the effects of the 2008 global financial crisis… If Brazil had not floated the Real in 1999, it would surely have done so since then, and possibly in more adverse conditions.

Besides Brazil, the former president of Central Bank of Republic of Turkey, Durmus Yilmaz (2011) stated in an interview that Turkey resisted global financial crisis mainly due to the implementation of flexible exchange rate regime. Also in the economics literature, flexible exchange regimes are regarded as the better policy option for developing economies and it is seen as an effective shock absorber in times of financial trouble (Edwards & Yevati, 2005). For example, the title of a recent book by Gagnon (2011) is "Flexible Exchange Rate Regimes for a stable World Economy". Allen, Rosenberg, Keller, Setser and Roubini (2002) stress that countries with floating rates are often better equipped to withstand external shocks by limiting the incentives for the accumulation of excessive currency risk. Chang and Velasco (1998) and Velasco and Cespedes (1999) highlight that flexible exchange rates may be helpful in impeding self-fulfilling bank runs and runs to foreign currency. Flexible exchange rates are advised profoundly for the developing economies to be protected against financial crises. Wyplosz (2008) quotes:

> A key conclusion from the crisis was that exchange rate pegging is dangerous when capital controls are removed… A high degree of exchange rate flexibility is required in order to reduce the risk of currency crises (p.4).

Similarly, high accumulated reserves in developing countries in the recent decade are regarded as a precautionary policy tool against financial shocks of this decade by policy makers and scholars (Cruz & Walters, 2008; Aizenman & Marion, 2003). They link the stable period of developing countries in the recent decade to

[23] It is strangely meaningful that a big developing economy celebrates the move to flexible exchange rate regime proudly. It is also fairly interesting that the president named the beginning of the flexible exchange rate regime as the "Special moment in the Brazilian economic history" (Meirelles, 2009). It seems central bankers in Brazil believe flexible exchange rate regime was the main cure of their past economic problems.

high accumulated reserves as well. For example, the president of Central Bank of Turkey, Erdem Bascı (2008) stated in a conference that: Turkey has accumulated reserves worth of 73.3 billion USD since 2002 and in developing countries similar to Turkey, such a strong reserve positions had great contributions to removing the negative impacts of both domestic and external shocks and increasing the confidence in these economies. Similar to his argument, Jeanne (2007) quotes that; "With international reserves four times as large, in terms of their GDP, as in the early 1990s, emerging market countries seem more protected than ever against shocks to their current and capital accounts" (p.1).

The conclusion is that the majority of the literature and policymakers treated flexible exchange rate regimes and large reserves as the main cures against the financial problems taken place in many developing economies in the 1990s[24]. And the good atmosphere in developing countries in the 2000s strengthened the belief, among economists and policymakers, that floating exchange rates and high accumulated reserves played vital roles in cushioning the economic problems in developing countries and protecting these countries from financial crises.

In this chapter, we claim that the interpretation that the flexible regimes and international reserves of central banks are a medicine for financial crises is misleading in some way. We believe that flexible regimes do not have a magic to prevent a crisis after a destructive speculative attack occurs. With deeply internationalized financial environment, leveraged financial systems, "hot moneys" flowing among emerging markets and over-heating credit expansions, speculative attacks or any financial shocks are inevitable for emerging countries. And these speculative attacks may induce financial problems and even crises under flexible exchange rate regimes as well. The prosperous years of developing countries in the

[24] It seems here that this argument of the literature is problematic in some ways. Because theoretically flexible exchange rate regimes require zero reserves. Freely floating exchange rates do need reserves to provide sustainability in the rates. Hence, accumulating reserves together with flexible exchange rate regimes lead to question the actual flexibility of exchange rate regimes. If high reserves are accumulated under the de jure flexible exchange rate regimes, actually we cannot say the regime is de facto flexible. And hence, the association of the stability obtained in the 2000s with floating exchange rate regimes seems inconsistent because with large reserves accumulated in these years, the exchange rate regimes of these years should not be named as freely floating. The existing literature did not focus on this inconsistency. Nevertheless, since we are questioning the roles of these so-called flexible exchange rate regimes in this thesis, we refer to this de-jure or so-called usage while mentioning "flexible exchange rate".

2000s were not the outcome of floating exchange rates and high reserves. But they are mainly the outcome of excess global liquidity inflows due to the liberalization policies of developing countries, very low interest rates in industrial countries and weakness of traditional safe havens in the years after the global financial crisis. Due to these factors plus some domestic factors, excessive amounts of foreign capital have been flowing into the developing countries, which contributes to growth but meanwhile bring fragilities and new risks to the financial system. In this chapter, we will go into details of these fragilities and the risk of a financial crisis due to these fragilities will be investigated.

We will show that if advanced countries get their safe haven status back, or a capital account shock triggered by high returns in developed countries, political instability in developing countries or changing expectations of investors hits a developing economy, new types of financial crises may be observed in developing countries. And these shocks and ensuing financial crises may occur in a country irrespective of the exchange rate regime it uses. These shocks may turn into financial crises through the mismatched balance sheets and rapid dollarization of balance sheets under flexible exchange rate regimes. And we claim that given since capital flows have been highly mobilized in developing countries, even excessive amounts of reserves may not be sufficient to alleviate these shocks and crises. These are the exogenous shocks which are expected to hit developing countries in the new period. Nevertheless, even if these exogenous shocks do not take place, we expect that an endogenous Minskyan credit cycle crisis will hit developing economies sooner or later. This would happen through the burst of excess credit booms fueled by large capital inflows in developing countries recently. All these possible cases of financial crises may even be observed in countries with current account surpluses.

The outline of the chapter is as follows: Initially, in the second section, we will look at the roles of external financial position of developing countries in triggering financial crises. How capital inflows and ensuing speculative attacks with the existence of safe havens would result in financial crises under flexible exchange rate regimes will be the concerns of this section. In the third section, we will investigate what a flexible exchange rate regime can do after a speculative attack which is mainly driven by safe havens. In this section, the roles of balance sheet

mismatches and volatility under a flexible exchange rate regime in transmitting the attack into financial turmoil will be investigated. The forth section will be devoted to the roles of foreign exchange reserves of the central banks in developing countries with flexible exchange rate regimes in impeding financial crises. The adequacy of reserves in the flexible regimes for preventing financial collapses and some other potential risks of foreign exchange reserve accumulation will be questioned in this section. In the fifth section, we will elaborate on the incidence of credit expansions, their financial risks and potential to create banking crises under flexible exchange rate regimes. In this section, the possibility of observing an endogenous Minskyan moment will be questioned. In the sixth section, we will question whether all these exogenous and endogenous financial shocks may hit countries with sound current account positions. And lastly, we will conclude the chapter.

4.2 External Financing and Capital Account Reversals

In this section we will show that capital account reversals and self-fulfilling speculative attacks are not much related to the use of exchange regime itself. And these shocks may happen under flexible exchange rate regimes too, depending on the external and internal factors.

As we indicated, in detail, in chapter three; surging capital inflows were a prevailing phenomenon for emerging markets in recent decade. Many experts associate this situation to the full liberalization of financial markets, and claim that the accompanying real sector success and robust growth of developing countries are the result of this surge of international capital. And contrary to this belief, several experts have the idea that the capital inflows, indeed, are the result of the success of developing countries, not the reason. Even if there was no consensus among economists on which comes first, all agree on one point that if this capital stops to flow into a country, the country would encounter undesirable results in both their real sector and financial markets.

Economists believe that capital flows are helpful for emerging markets, but possess significant risks which may remove all its benefits in the worst case scenario.

Reinhart and Reinhart (1998) describe this as "mixed blessing of capital inflows". According to them;

> Capital inflows provide important support for building infrastructure and harnessing natural and human resources. At the same time, surges in capital inflows may distort relative prices, exacerbate weakness in a nation's financial sector, and feed asset-price bubbles (p.2).

And besides these risks, in the worst case, the reversals of capital inflows may deteriorate the macroeconomic fundamentals of the economy. The abrupt cessation in foreign capital inflows and/or a sharp capital outflow concurrently with a currency crisis is what economists call as "sudden stop problem" (Hutchison & Noy, 2004).

As we indicated in the mainstream three generations of crises in chapter 2, the reversals of foreign capital are associated with financial crises. As a summary, irrespective of exchange rate regime, financial crises occur in the following manner; sudden stops or capital outflows raise the demand for foreign currency and meanwhile demand for domestic currency drops. After a certain point, foreign exchange reserves would not be enough to meet the excess demand for foreign currency and a sudden devaluation or a large depreciation occurs. The devaluation or the depreciation in domestic currency has severe consequences in the economy due to their impacts on the balance sheets of domestic firms and banks. In emerging markets, firms and banks cannot borrow abroad in their own currencies, and even domestically they have difficulty to borrow long term in their own currency. This problem, called as "original sin" by Eichengreen and Haussmann (1999), leads to financial fragility via two balance sheet mismatches; currency and maturity mismatches. These factors explain how a collapse in the value of a domestic currency ends up with a financial crisis. Currency mismatches occur when an economy has excess foreign currency debt but not adequate foreign currency assets. And maturity mismatches occur when the liabilities of the economy are mostly short-term oriented but the assets and receivables are long term[25]. Due to this "original sin"

[25] Foreigners are unwilling to lend to the borrowers in their local currency, because a prospective depreciation in the exchange rate causes the real value of their receivables to decline, hence developing economies have to hold foreign currency denominated funds from abroad. This is the reason why currency mismatch is unavoidable. Similarly, due to the history of high inflation in developing economies, financing the investment projects happens via short-term funds, because

of emerging economies, the depreciation or the devaluation in domestic currency leads foreign debt burden to skyrocket (in terms of domestic currency). Firms or banks face difficulties in repayment of their foreign currency liabilities and, according to Minskyan approach; they turn their "hedge financing" profile into "Speculative" or "Ponzi" financing profile[26]. That means they cannot meet their foreign currency obligations after this point, and firms fall into bankruptcies. The impacts of this process may spread to other sectors in the economy and output drops and unemployment rises.

Most of the previous crises models argue that the sudden stops and disastrous consequences of sudden stops in financial systems are mostly related to fixed exchange rate regimes. And, as we discussed in the second chapter, the experience of past emerging market crises showed most of the crises episodes occurred in the countries with fixed exchange rates. However, as we will discuss, the capital account reversals may be observed under flexible exchange rate regimes as well. The choice of exchange rate regimes may not make a big difference. In this section, initially we will analyze the causes of the capital inflows to developing countries and the reason for their reversals. We will show that sudden stops may occur irrespective of exchange rate regime used and mostly they are not caused by internal factors. In the second part, we will focus on the roles of safe haven currencies in the capital movements to developing countries. We will show that the existence of safe havens may aggravate the capital account shocks in developing countries. And under flexible exchange rate regimes, the presence of strong safe havens may be a source of financial crises in developing countries.

---

creditors are reluctant to lend long-term funds to avoid a decline in the value of the funds they lent through inflation. This explains why maturity mismatch is a chronicle problem in developing countries.

[26]Hedge profile is that firms or banks have sufficient cash flows for meeting their debt commitments and as a cushion against unexpected fall in their future cash flows. Speculative profile occurs when the firm has not sufficient cash flows to meet its outgoing payments in some future periods. Speculative profile turns into a Ponzi profile when external or internal shocks (a rise in foreign interest rate or capital outflow) trigger a situation that the firm cannot meet its current cash commitments and it needs further debt to finance the existing debt. The firm couldn't meet its liabilities by liquidating its assets, so the firm is insolvent (Kregel, 2004)

4.2.1 Internal and External Factors behind Capital Account Reversals

In this part, we will elaborate on the factors which lead to sudden stops and capital flights in developing countries. We will point out that these factors are independent of the choice of exchange rate regimes, hence may be observable under flexible exchange rate regimes as well. To determine the causes of capital account reversals, we initially need to look at the motivations for capital inflows to developing economies.

In the literature, there is an extensive empirical and theoretical research investigating the motivations of investors for directing their portfolios to developing country assets (Chuhan, Claessens & Mamingi, 1993; Claessens, Dooley & Warner, 1995; Fernandez-Arias, 1996; Fernandez-Arias & Montiel, 1996; Forbes & Warnock, 2011). The causes of capital inflows are explained by pull and push factors by this literature. Pull factors are country specific domestic policies or macroeconomic indicators which attract foreign capital into a country. Push factors are the developments or policies outside the country which lead foreign investors to invest in this country. For this study, we call them as internal and external factors. Some of the internal factors could be summarized as;

- Improved domestic policies which increase the rates of return and reduce the perceived risk on domestic investments
- Policies that increase the openness of the domestic financial market to foreign investors, such as the removal of capital controls and liberalization of restrictions on foreign direct investment. (Fernandez- Arias & Montiel, 1996, pp. 58-59)
- Creditworthiness of the country and secondary market prices of foreign debt in the country (Taylor & Sarno, 1997)

These factors indicate the drivers of foreign capital, which are internal to the country. If the rates of returns on domestic assets are relatively higher than the rest of the world, it is expected that more foreign capital flows into the country. Also, if a country hedges properly the risks on their assets, which decrease the risk perception toward the assets of the country, foreign capital choose these domestic assets. Furthermore, if the country is believed to be credible on their debt commitments (this may be ranked by credit rating agencies), the country attracts more foreign capital.

Besides these internal drivers, there are also other factors which are beyond the control of the country. These factors are called as external factors. The returns on financial assets in advanced countries, particularly the US, are the most important external pushing factors of capital flows to developing region. There are several theoretical and empirical studies that explain the capital flows to developing countries with the level of interest rates in industrial countries (Calvo, Leiderman & Reinhart, 1993; Calvo, 1999; Eichengreen & Rose 1998; Fernandez-Arias, 1996; Frankel, 1992). The study by Calvo, Leiderman and Reinhart (1993) is the initial empirical work investigating the causes of capital inflows in developing countries (their study focused on the Latin American region) in the 1980s. They conclude that the level of interest rates in the U.S was significant in explaining capital inflows in Latin America in the 1980s. They found that the low level of interest rates and slow growth or a recession in the U.S. increased the amount of foreign capital surge in Latin America. They claim that investors search for high-return assets in developing countries when the returns in developed countries are low. Chuhan, Cleassens and Mamingi (1993) find out that low interest rates and a slowdown in industrial activity in the U.S. play a significant role in large capital inflows into several developing countries in Asia and Latin America. They employ panel data estimation and their results indicate that about half of the increase in the capital inflows in Latin America can be attributed to the slowdown in interest rates and the economic activity in the US. Calvo (1999) points out international capital movements are all significantly affected by the swings in the interest rates of industrial countries[27]. In a very recent study, Forbes and Warnok (2011) further claim that global risk levels are also influential on international investment positions of countries. Global risks are associated with capital flows to developing economies. Increasing global risks and hence rising risk aversion by investors lead to capital retrenchments and sudden stops in many countries. The main conclusion is that international interest rates, returns on industrial country assets, business cycles in the large countries of a region and global

[27] They also found out that capital inflows/outflows into the larger countries in the region tend to encourage inflows / outflows to the small countries. Put it differently, if a large country attracts more capital, the other countries in the same region with the large country gets higher capital too or vice versa. This is called as contagion effect and this could also be another external factor of capital flows to developing countries.

risk appetite or aversion are all significant external factors explaining the capital inflows in developing countries.

Our discussion has so far focused on internal and external factors explaining capital flows to developing countries. The important question is; are domestic or external factors more effective in explaining capital flows? The widespread view, proven by many empirical and theoretical studies that external factors are significantly much more important than domestic factors. Fernandez-Arias (1996) assert that "… the main empirical result is that the surge of capital inflows appears to be driven more by low returns in industrial countries than domestic factors" (p.3). Chuhan, Claessens and Mamingi (1993) found out that equity flows to Latin American and Asian countries are mostly affected by external global factors. Forbes and Warnock (2011) state that domestic factors have almost no effect on capital flows to developing countries and global factors are the most important drivers of waves of capital flows. Their findings indicate that capital controls have no significant effect on a country's likelihood of experiencing extreme capital flows. There are even more studies showing that international conditions are more significant than the domestic factors in explaining capital inflows to developing countries. In short, it is notably accepted that capital flows in developing countries are mainly determined by external factors more than internal factors.

The increase in the net capital flows in developing countries in the 2000s compared to the 1990s, which was demonstrated in the third chapter, may be a useful example to the discussion above. We have shown in chapter 3 that private capital inflows and net capital flows in developing countries increased substantially in the 2002-2007 period compared to the 90s and 80s (Look at Figure 3.8 and Table 3.1). The boom in capital inflows in developing economies in the 2000s was tied to the several factors in the third chapter. And among these factors, it was pointed out that the very low level of real interest rates in industrial economies in the 2000s relative to the 1990s has significant role in capital flow surge in developing economies (See Figure 3.11). The literature gives particular attention to the decreasing rate of returns in industrial countries in explaining the financial flows in developing countries in the 2000s. Even though this argument is true, we will look at the issue from a slightly different perspective from the majority of the literature in this chapter. We believe

that the spread between the yields in developing countries and the yields in advanced countries should be at high levels during the capital inflow boom periods in developing countries. And this phenomenon may better explain the recent capital inflow surge in developing countries.

4.2.1.1 The Role of Return Spreads between industrial and developing countries

We showed in the literature review part of this section above that external interest rates are regarded as the most important factor for the capital movements in developing countries. In this section, we will show that this picture is best observed by looking at the differentials in the returns between developing and advanced countries. This is because global investors prefer to fill their portfolios with the relatively higher-return funds. Relative return differentials are more effective in their investment decisions. Even if the returns in a country decline over time, the investors want to stay in that country provided that the returns in that country are relatively greater than the other regions. For this reason, we expect that developing countries attract more capital as the yield spreads between them and advanced countries are higher (assuming that other factors are constant).

For example, if we look at the period of capital inflow booms in developing countries in the 2000s, we see that nominal and real interest rates declined significantly in developing countries. However, despite this decline in the interest rates, developing countries attracted foreign capital at record levels. Hence, one should expect that despite the fall in the interest rates in developing countries, the return spreads between developing and advanced countries widened in this period in favor of the developing world.

We calculated the return spreads in developing countries with advanced countries for the 1990s and 2000s. For this, we use the stock market returns for several developing countries. This is because it is very difficult to find a common interest rate or equity return indicator for several countries. Share price index is easily obtainable and common indicator for each country. Also significant portion of private equity flows in developing countries is constituted by stock market flows

hence stock returns could be used as an appropriate return indicator for a country. By returns we mean the annual percentage change in the share price indexes provided by IFS (CEIC, 2012) for each country. Furthermore, not only nominal returns in stock exchanges are a source for profit for foreign investors but the appreciation in exchange rate (depreciation of domestic currency) yields profit for them too. Hence in calculating the total returns for stock market investments in developing countries, we take the exchange rate movements into consideration. The basic formula we produced for the total amount obtained after a year for 1 USD investment in developing country stock market by foreigners is as follows:

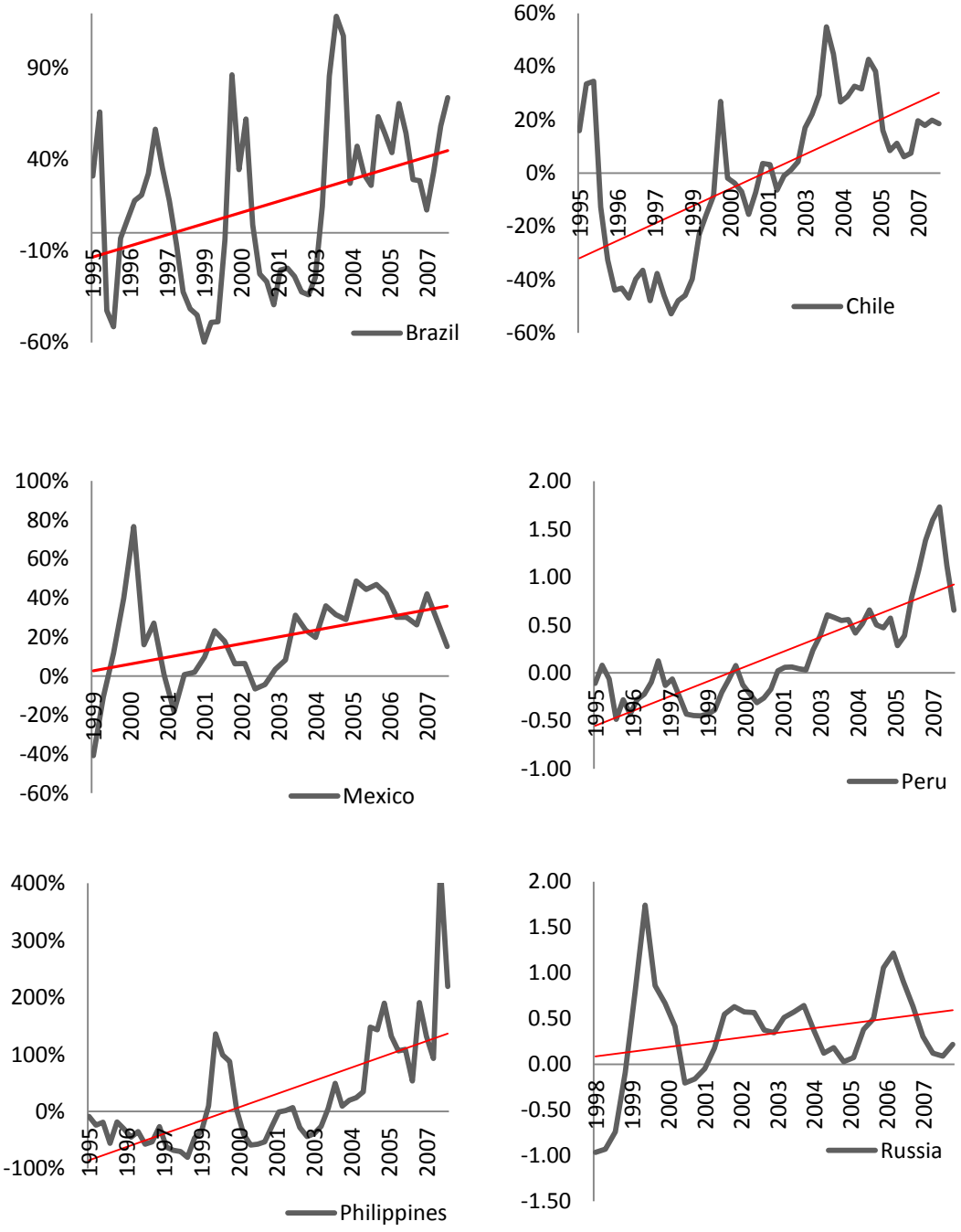
$$\boldsymbol{R = 1 * e_t(1 + r)\frac{1}{e_{t+1}}}$$ where

R: Total amount obtained after one year
$\mathbf{e_t}$ and $\mathbf{e_{t+1}}$: Current and one year later exchange rates respectively, (value of the domestic currency in terms of USD)
r: Annual stock market return

If we subtract the initial amount of 1 USD from total amount obtained after one year (R), we end up with the rate of return of the stock market investment by global investors. After that, we calculate the return spreads between emerging markets and industrial countries using the annual stock exchange returns in the US as the benchmark indicator of industrial countries. The difference between the returns calculated for developing countries using the above formula and the US stock returns gives us the return spreads. In Figure 4.1, the spreads between several emerging market returns and US returns are graphed. It is clear that particularly after 2002, the spreads were much higher than the spreads in 1996-2001 for most of the countries. Also after 2002, the spreads were positive and more stable in all the countries in the figure than the pre-2002 years. In Mexico, Brazil and Chile there was a sharp decline in the spreads in 2002-03 and this may be due to the impact of the severe peso crisis hit Argentina in 2002. However, after 2003 the spreads sharply increased in these economies. In Brazil, there was a spike in the spread in late 1999, and this may be linked to the significant fall in the stock market returns during the Brazilian financial crisis in 1998. Hence the stocks purchased during the crisis yielded extensive profit in one year in 1999. Similar spike is observed in Turkey in 2000, implying the pre-

crisis asset price boom in Turkey. Without considering these exceptional cases, spreads in both countries were significantly larger in 2002-2007 than the 1990s.

Stock Market Return Spreads between Emerging Markets and the US



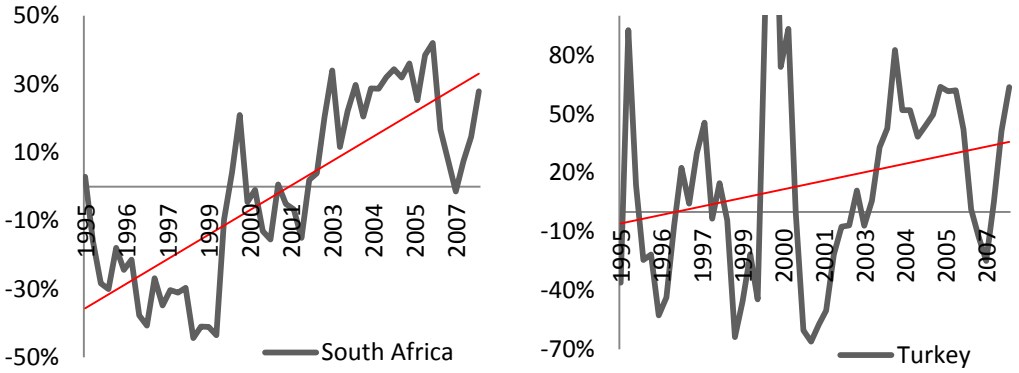
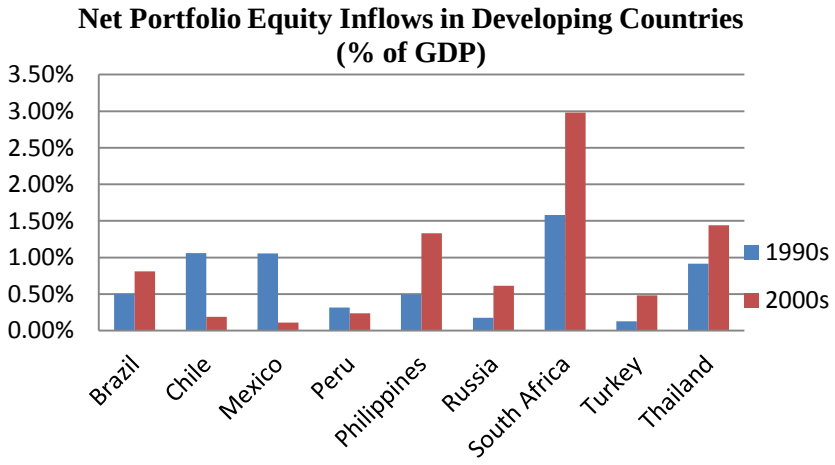


Figure 4.1: Stock market return spreads in several developing countries. It is calculated by differentiating the exchange-rate adjusted returns in developing countries and the annual US stock market returns. Returns indicate annual values and calculated quarterly for each country. Red lines indicate the trend line of each graph.

These rises in the spreads may have been a significant factor in the capital flow bonanzas in developing countries after 2002 till 2007, which the existing literature did not pay attention to. In chapter 3, in several places, we depicted the large capital flow surge in developing countries in the 2000s. In this chapter, we will figure the change in the net portfolio equity inflows in developing countries. This is because a high portion of portfolio equity inflows consists of the stock market inflows in developing countries and hence the change in these flows may perfectly reflect the change in the stock market return spreads in developing countries in the 2000s. Increase in the stock market return spreads is expected to lead to an increase in the net portfolio equity inflows, which involves stock market inflows. Figure 4.2 demonstrates the net portfolio equity flows (share in the GDP) in several developing countries and country groups.



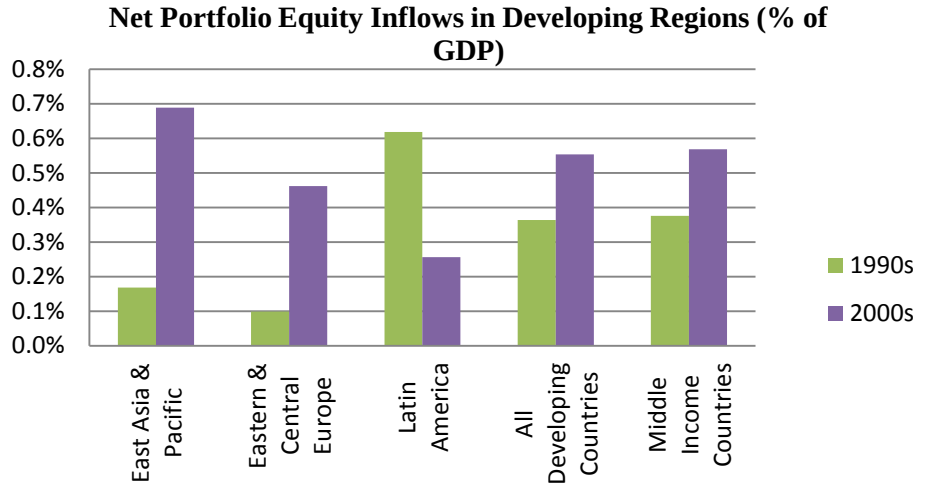


Figure 4.2: Net portfolio equity inflows in developing countries in the 1990s and 2000s. The 1990s are the years between 1990 and 1998; and the 2000s consist of the years 1999-2007[28].

The interpretation from the two graphs in Figure 4.2 is that net portfolio equity flows significantly increased in the most of developing countries. The only exceptions are Chile, Mexico and Peru, because the financial turmoil of Argentina in 2002, which spread to other countries in the region, led to a significant contraction in the capital inflows to the region for 2 years. For all the country groups, except Latin America, there was also a sharp increase in the net portfolio equity inflows. All these increases (figured in 4.2) may be attributed, to a great extent, to the increases in the stock market return spreads between developing countries and the US in the period of 2002-2007.

4.2.1.2 The Association between External Interest Rates and Financial Crises in Developing Countries

In addition, rising interest rates in industrial countries may cause financial problems and even crises in developing countries through a different channel. Developing country banking system holds large amounts of external funds and uses these funds in the issuance of domestic credits. Rising interest rates abroad may

[28] Due to data unavailability, in Peru, the 1990s consist of the period of 1993-1998 and the 2000s are the period of 2000-2005. For Philippines, the 1990s are 1996-2001 and the 2000s are 2002-2007. And For Russia, the 1990s are 1994-2000 and the 2000s are 2001 and 2007.

cause a trouble of repayment of external loans by these banks. Also since external borrowing becomes more expensive with higher interest rates abroad, the number of external funds by banks decline. Hence, they issue less credit, market becomes illiquid and output growth declines in developing countries. Furthermore, since domestic banks begin to borrow at higher rates abroad, this would pass through the domestic interest rates because banks want to lend at higher rates. This would lead to moral hazard and repayment problems in domestic borrowers and may trigger a banking crisis. Eichengreen and Rose (1998) investigated the association of banking crises with adverse external conditions. They found out that developed country's interest rates are strongly associated with the onset of banking crises in developing countries: "A one percent increase in Northern interest rates is associated with an increase in the probability of Southern banking crises of around three percent." (Eichengreen & Rose, 1998, p.1). That means that the swings in the financial markets in industrial countries may cause undesirable impacts and even financial crises in developing countries.

As we indicated many times in this thesis, capital flow reversals are the triggering factors in developing country financial crises. And as we indicated in the current section so far, capital flow reversals may not be controlled by domestic policies and depend mainly on external situations. Hence, the existence of different exchange rate regimes may not have a significant impact on the causes and timing of capital account reversals. A country may successfully sustain a flexible exchange rate regime with sound monetary and fiscal policies. However, an external shock may create a financial crisis in these economies as well.

4.2.2 The role of "Safe Haven Currencies" in Developing Country Crises

Foreign investors may play a significant role in the developing countries where risks and uncertainties are relatively higher than the other countries. When a country's financial system sends signals of overheating and increasing risks, which might be due to political turmoil, rising current account deficits or high public debts; investors do not want to direct their portfolios to that country. These are the internal fragilities which discourage global investors to keep their funds in that country. In

this circumstance, foreign investors seek a safer place for their funds. These places are generally less-risky industrial countries. In the literature, the currencies of these safe economies are called as "safe haven currencies". In general, the US dollar, Great British Pound, Japanese Yen, Swiss Franc and similar currencies are regarded as safe haven currencies (Ronaldo & Söderlind, 2010). As the global risks or risks in developing countries increase, investors may prefer these currencies even if they offer low yields.

The main characteristics of a currency to have a safe haven status are summarized by Habib and Stracca (2011):

- The country issuing it itself should be safe and low-risk.
- The country supporting safe haven status should be well developed and have very liquid financial systems, which are appreciated when international liquidity dries up.
- A safe haven should be insulated from global turbulences when the turbulence strikes other countries.

An advanced country with a liquid and low risk financial system and which are not exposed to the global risks are appreciated as a safe haven by risk-averse investors. The existence of safe havens in the world makes foreign capital in developing markets more volatile, since once international investors sense some risks in their portfolio and equity investments in developing countries, they feel free to run away from the assets of developing countries. When a domestic shock hits a developing country, the presence of safe havens would make capital flow reversals in that country easier and faster. The probability of capital account reversals increases with the existence of safe haven currencies. And additionally, since capital reversals are triggering factor in modern crises, the presence of safe havens increases the probability of financial crises in developing countries.

For instance, Asian financial crisis of 1997-98 resulted in $80 billion net reverse capital flows from the four countries in the crisis region; Indonesia, Korea, Philippines and Thailand. These reverse flows went first to offshore banks, then banks in Europe and eventually majority of the flows reached the United States (Wincoop & Yi, 2000). Figure 4.3 exhibits the banking flows from four Asian

countries (Indonesia, Korea, Philippines and Thailand) starting from June 1997 till the last quarter of 1998 to some developed economies.

Banking flows among some countries during Asian crisis (Billion $)

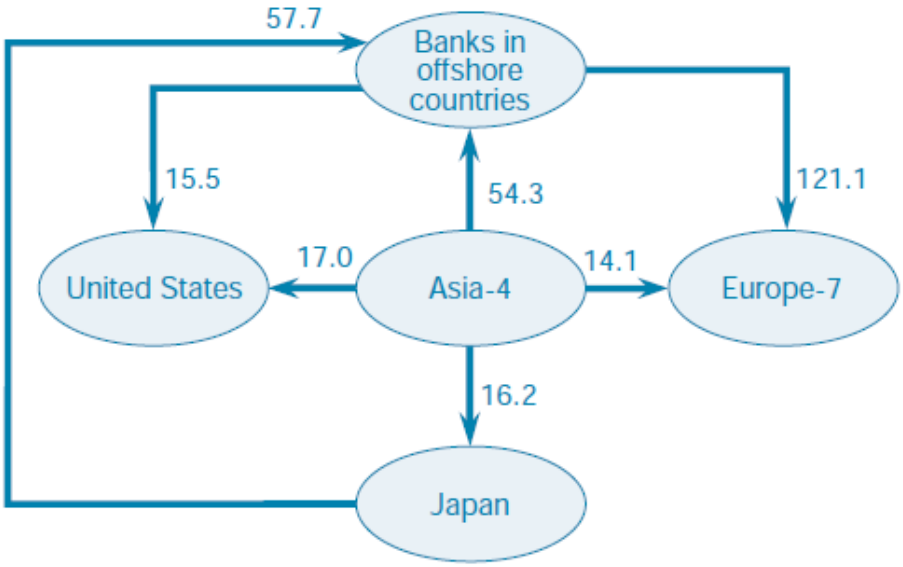


Figure 4.3: Banking flows from Asia to BIS (Bank for International Settelment) reporting banks in offshore centers and industrial countries during the South Asian crisis in 1997-1998. Asia-4: Indonesia, Philippines, Korea and Thailand. Europe-7: France, Germany, Italy, the Netherlands, Spain, Switzerland and the UK.[29]
Source: Wincoop and Yi (2000), and BIS.

Total flows to offshore countries from Asia-4 and Japan equals to 112 billion $. Final flows to seven European countries (France, Germany, Italy, the Netherlands, Spain, Switzerland, and the United Kingdom) in that period were amounted to 145 billion $. For the US, the number was 32 billion, which more than half of them come from Asia 4.

Also some evidences suggest that government securities in developed countries were regarded as safe havens during the Asian crisis. Figure 4.4 indicates the net purchase of government securities by non-residents in four industrial countries during the Asian crisis.

[29] Banking flows represent the net liabilities of BIS reporting banks in the selected countries.

Purchase of government securities by non-residents (Billions $)

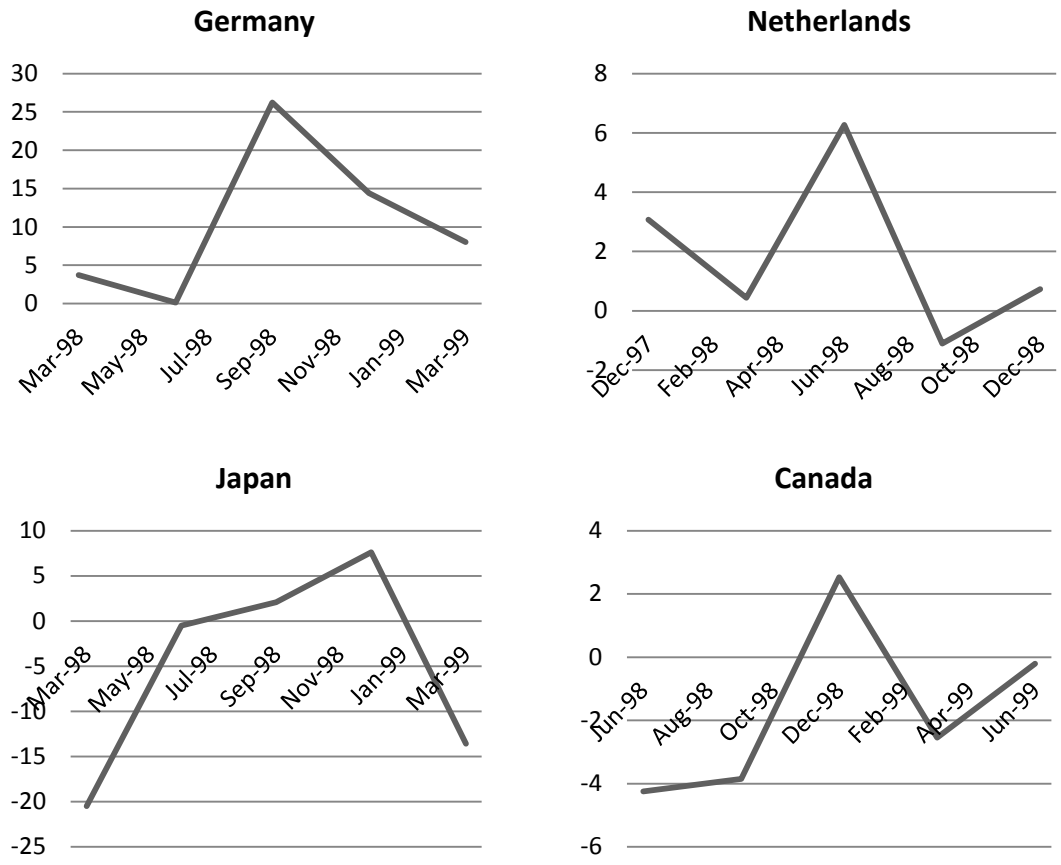


Figure 4.4: Net inflows of government securities by non-residents in four advanced economies during the Asian crisis of 1998. Values are in current billions ($).[30] Source: CEIC and IFS

It is clearly observed that starting from the second quarter of 1998, when the crisis was at peak, net government securities inflows increased substantially in these industrial economies. From the last quarter, the security purchase declined to its pre-crisis levels. For example, the purchases of German debt securities by non-residents, which had averaged 11.4 billion Deutche Marks (DM) per month during the first half of 1998, went up to 34.5 billion DM in July and remained close to this level in August (Upper, 2000). All these examples indicate that safe haven impact was significant in the Asian crisis.

Safe haven currencies are the last stop of global investors, when risks and overheating pressures become apparent in developing economies. However, if safe

[30] Net government security inflows are equal to purchase of securities minus the sale of securities by the non-residents. The minus flows indicate foreigners sold more than they purchased.

havens are not strong and they have their own fragilities, the global funds in developing countries may not move, to a great extent, into these havens. The investors may choose to stay in developing economies because other destinations are not safer. Our current argument has analogy with the discussion in chapter three. We have shown in the third chapter that developing economies in the recent global crisis performed better and their recovery was quicker than industrial countries. Furthermore, capital flight from developing countries in the global financial crises was not as severe as the other past crises hit developing countries in the 1980s and 1990s. This could be tied to loss of safe haven status of industrial countries. The crisis originated first in the US and quickly spread to other advanced countries. Several banks and hedge companies bankrupted, and big financial companies of advanced countries declared profit losses. Natural safe havens were not safe anymore and they became riskier places to invest in. Developing countries were also influenced by this riskier environment in the industrial world, and experienced halt of capital flows. However, the halt was calmer and more moderate than the past shocks of the 1990s in developing countries. Developing countries did not experience massive and deep foreign capital flight as in the previous developing country crises.

For example the capital account reversal shock in Argentina during the 2002 financial crisis was so severe that net capital inflow to Argentina was negative for 3 years till 2004. At the peak of the crisis in 2002, total reversal in foreign capital flows from Argentina reached more than %10 of its GDP (Figure 4.5). If we look at Figure 4.6, during the global financial crisis, the reversals of inflows were moderate. At the peak of the crisis, in 2009 the maximum outflows were equal to %4 of the GDP. The difference between these two crises may be attributed to the existence of stronger safe havens in the former crisis. In 2002, Argentina's internal fragilities were severe yet the financial system outside was moderate. Coupled with the safe haven impact, huge amount of capital left the country in a couple of months. During the recent global financial crisis, the internal fragilities were not apparent; however, the external shocks magnified these fragilities in Argentina. Nevertheless, since safe havens were in trouble, global investors kept their portfolios in Argentina. The loss of foreign capital was %4 of GDP in Argentina during the global crisis, which was quickly recovered in one year.

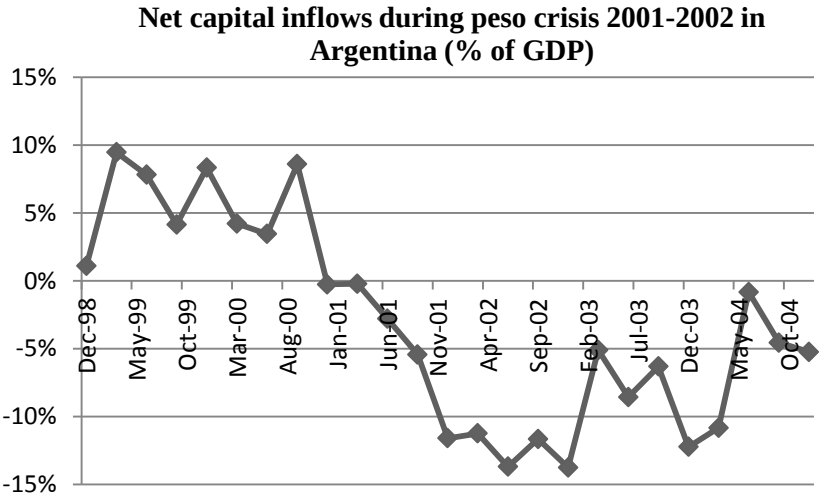


Figure 4.5: Net capital inflows in Argentina during the 2002 financial crisis. Each point in the figure represents the quarterly flows. From April 2001 till the midst of 2004 net capital investment by non-residents was negative and foreign capital amounting of more than 10 percent of the GDP left the country in each quarter[31]. Source: CEIC and IFS.

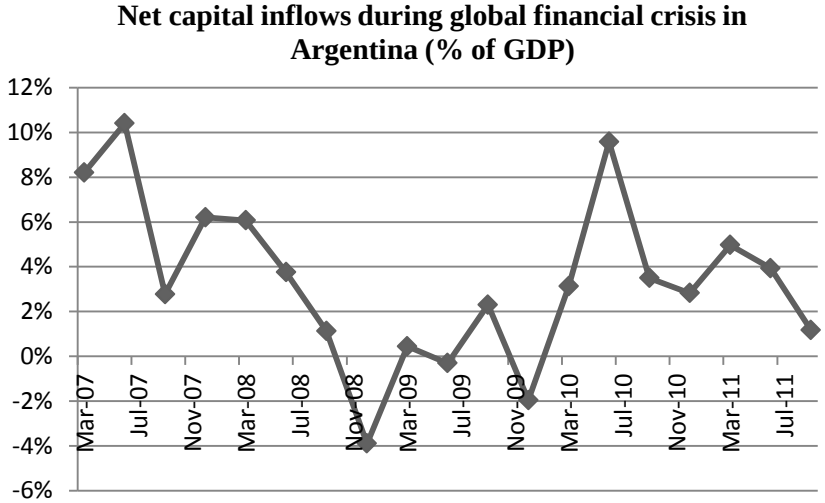


Figure 4.6: Net capital inflows in Argentina during 2008 global financial crisis. Each point in the figure represents the quarterly flows. Source: CEIC and IFS

The conclusion from the Argentinean case during peso crisis should be that once internal imbalances get bigger, the presence of safe havens would undermine the economy and destroy its capital account. We may observe this reality in several financial crises of the 1990s and early 2000s. Figures from 4.7 to 4.12 exhibit the

[31] Capital inflows consist of the foreign direct investment, portfolio equity and debt security flows and other flows by non-residents. Inflow data is collected from the liability side of the financial account in the quarterly balance of payments statistics of each country. Net capital inflows represent that more foreign capital left the country than invested in the country.

similar comparison of capital account reversals between the previous financial crises and the recent global financial crisis in Turkey, Indonesia and Mexico.

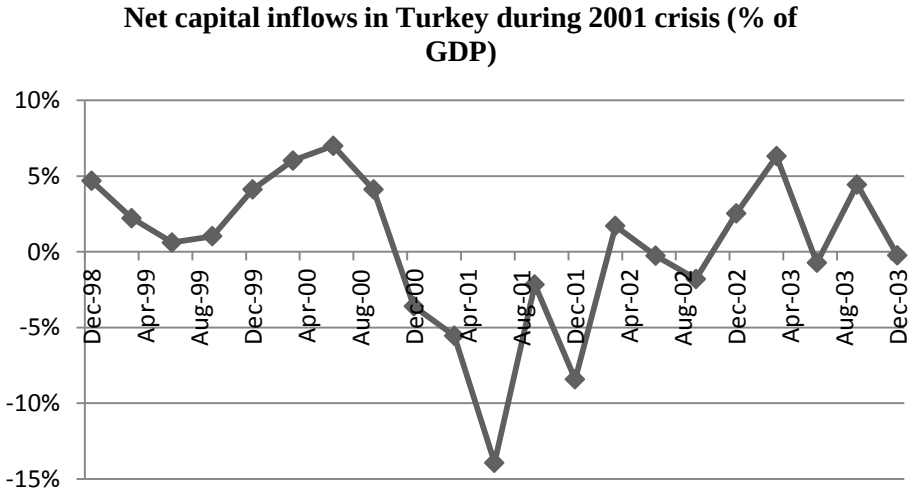


Figure 4.7: Net capital inflows in Turkey during 2001 financial crisis. Each point in the figure represents the quarterly flows. Since December 2000, foreign capital amounting to more than ten percent of GDP left the country for the consecutive 4 quarters. Source: CEIC and IFS

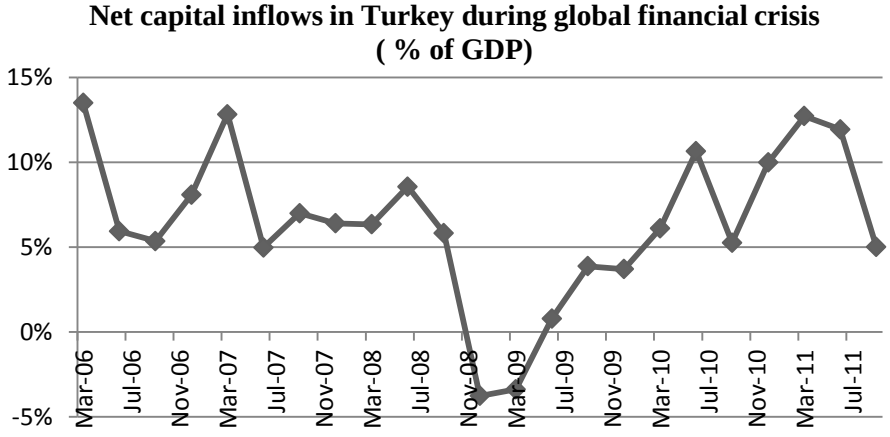


Figure 4.8: Net capital inflows in Turkey during 2008 global financial crisis. Each point in the figure represents the quarterly flows. Source: CEIC and IFS

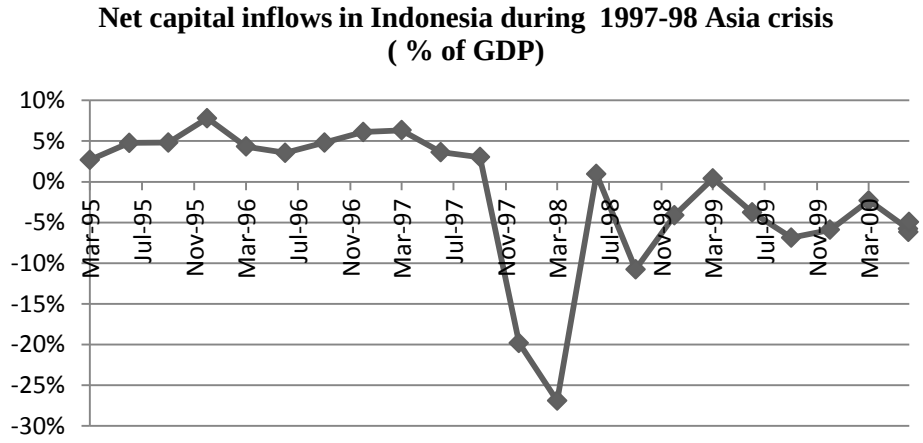


Figure 4.9: Net capital inflows in Indonesia during 1998 Asia financial crisis. Each point in the figure represents the quarterly flows. Source: CEIC and IFS

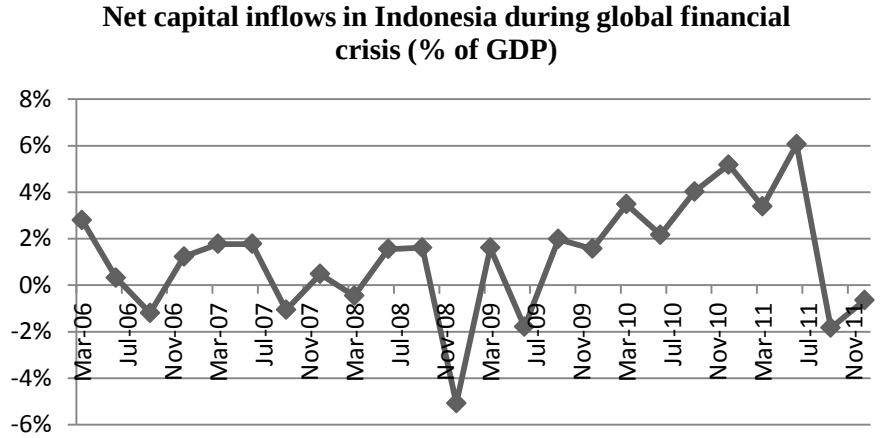


Figure 4.10: Net capital inflows in Indonesia during the global financial crisis. Each point in the figure represents the quarterly flows. Source: CEIC and IFS.

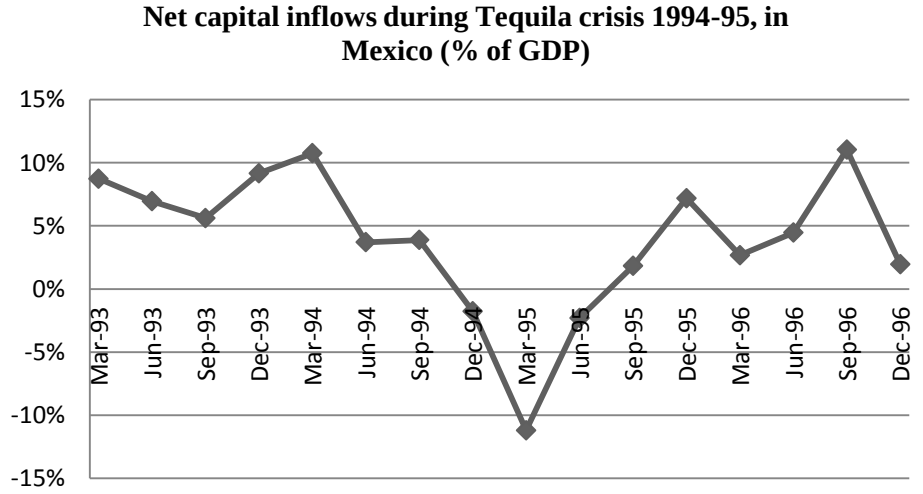


Figure 4.11: Net capital inflows in Mexico during the Tequila crisis in 1994-95. Each point in the figure represents the quarterly flows. Source: CEIC and IFS

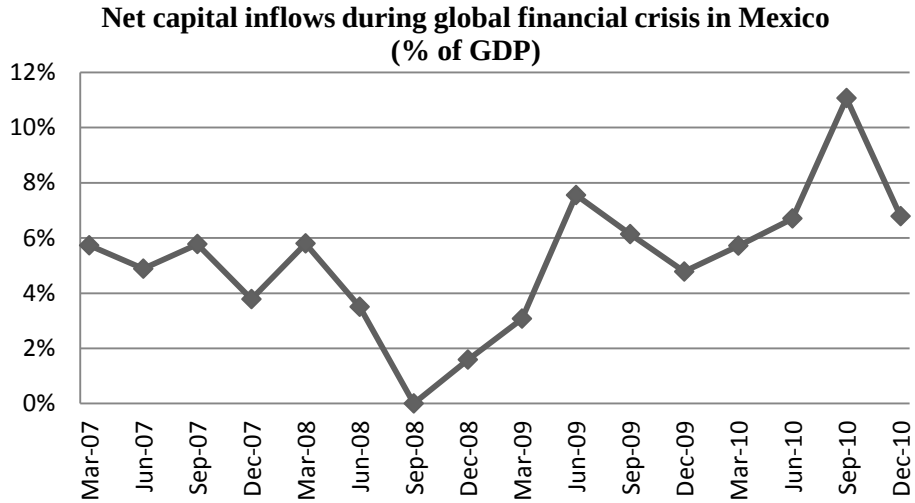


Figure 4.12: Net capital inflows in Mexico during the global financial crisis. Each point in the figure represents the quarterly flows. Source: CEIC and IFS

In Table 4.1, we can see the summary of the figures above. The net capital inflows (as of GDP) in these four countries during their past crises and during the recent global financial crises were depicted. This table indicates that for the two years when their local crisis was at peak, the reversals of capital inflows were much more severe than the halt in the capital inflows in these countries during the global financial crisis.

The conclusion from the above cases of Argentina, Turkey, Indonesia, Mexico and from other developing country cases is that capital account shocks were not significant and persistent in developing countries during global financial crisis. And this may, to a great extent, be attributed to the non-existence of strong safe havens. Because during the past crises episodes of developing countries, the existence of safe havens led destructive capital account shocks in developing countries.

Table 4.1: Net capital inflows (% of GDP) during the two years when the country was severely impacted by its own crisis in the past and net capital inflows in the same country during the 2 years of the global financial crisis.

Countries	Countries' own crisis dates / Net capital inflows (% of GDP)	Global Financial Crisis / Net capital inflows (% of GDP)
Argentina	2001 / -12 % 2002/ -13 %	2008 / +1,7 % 2009 / -0,02 %
Turkey	2001 / -7 % 2002 / +0,7 %	2008 / +4 % 2009 / +1 %
Indonesia	1998 / -13 % 1999 / -3 %	2008 / -1 % 2009 / +0,75 %
Mexico	1994 / +1% 1995 / -10%	2008/ +3% 2009 / +4%

Source: IFS and CEIC

In addition, the loss of safe haven status of the industrial world during the global crisis may be observed by looking at the real exchange rate movements in developing countries during the crisis. The previous developing country crises mostly ended up with the large depreciations of local currencies. However, the global crisis didn't lead to great depreciations in developing country currencies. On the top of it, the currencies of developing countries appreciated during the early phase of the global crisis in 2008, implying that developing country currencies were, to some extent, regarded as safe havens in the initial stage of the crisis. Figure 4.13 depicts the movements of the several exchange rates in developing countries. Till the March 2009, almost all developing country currencies appreciated and after April, the currencies started to depreciate. The appreciation of developing country currencies

stopped when the signals of recovery started appearing in the U.S. In the mid-2009, the US economy obtained some relief after the great turmoil, and thus USD assets began to gain their safe haven roles back, which they lost at the peak of the crisis in 2008. For this reason, after the mid-2009 investors increasingly preferred USD assets and this led to depreciations in the currencies of developing countries against the USD. However, even these depreciations in the currencies were smaller than the depreciations observed in the past crises episodes in developing economies. Hence the movements in the exchange rates of developing countries imply that traditional safe havens have lost their status and significant reversals leading to huge depreciations were not observed in developing countries during the global crisis.

Exchange Rate Movements in Developing Countries during the global financial crisis

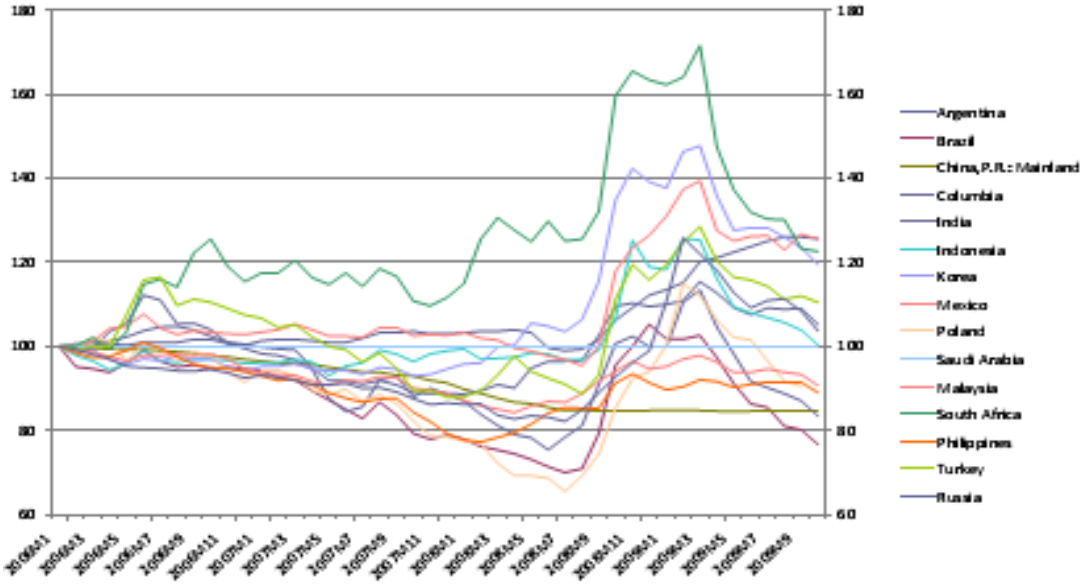


Figure 4.13: The movements in the nominal exchange rates of developing countries during the global financial crisis. The rate in January 2006 is fixed at 100. Source: IFS and Bibow (2010).

We explained the roles of safe havens in aggravating the internal vulnerabilities of developing countries, in triggering capital account reversals and financial crises in developing economies. The internal financial risks in developing economies can be related to current account deficits, political turmoil, rising budget deficits, credit bubbles, high inflation and many others. These risks may occur in developing economies without much regard to exchange rate regimes being implemented. When the risks take place, people may prefer safe haven currencies to

invest in. When these internal shocks are coupled with the sound performance of industrial countries (existence of safe havens), the shock becomes even worse and disastrous. This would lead to new types of financial crises in developing economies. Figure 4.14 demonstrates the roles of safe havens in the occurrence of financial shocks and crises in developing economies. And, irrespective of the exchange rate regime being implemented in a developing economy, this type of a capital account shock and financial crisis may hit that economy.

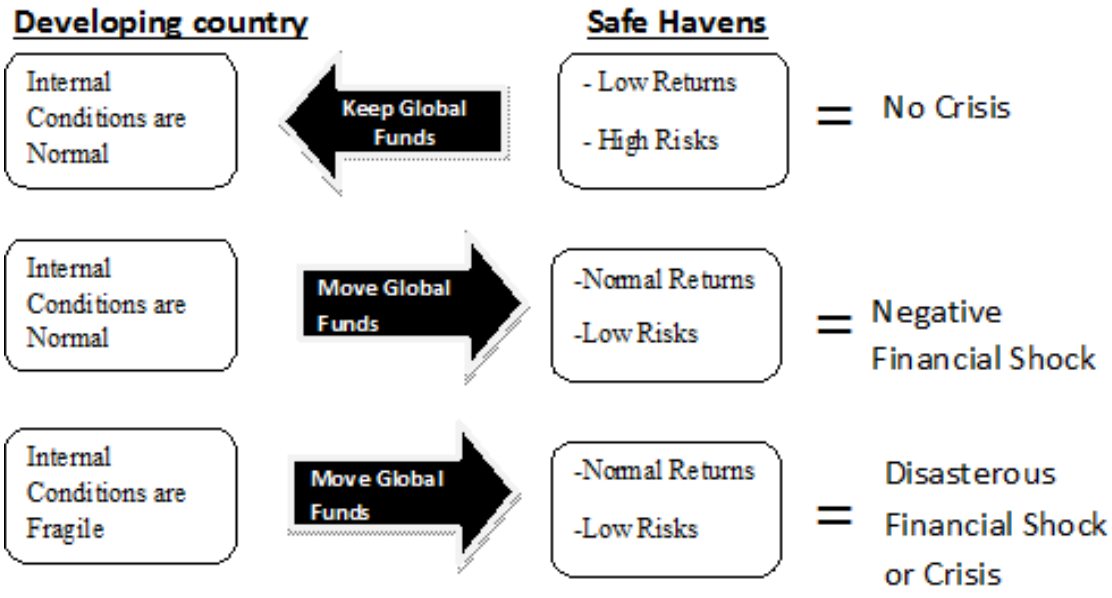


Figure 4.14: The role of safe havens as a triggering factor of financial shock is developing economies.

The summary of this section is that speculative attacks may occur once internal system becomes fragile with higher returns in industrial countries and/or strong safe havens are present in the world. And one may reach a conclusion that capital account reversals have not much to do with the exchange rate regimes implemented in a country. Hence, contrary to the early wisdom that flexible exchange rate regime averts sudden stops; we argued that capital account reversals may hit a developing economy depending on the external or internal factors and mainly existence of safe havens. We believe that when industrial countries gain their safe haven status back and the risks become softer, and returns become higher in

advanced countries, some fragile developing economies may witness serious capital reversals and financial distress. These shocks may hit developing countries independent of the exchange rate regimes they used. And, of course flexible exchange regimes do not have the tools to impede these shocks.

Now, the question is once a speculative attack hits a country, does the exchange rate regime choice make a difference in turning the attack into financial turmoil? More precisely, could flexible exchange regimes soften the impacts of speculative attacks and prevent financial turmoil? These questions have implications for the balance sheet structures of the financial institutions and firms in developing countries; since, as we indicated in the discussion on the generations of crises models of chapter 2 and in the beginning of this section, foreign currency debt related balance sheet mismatches are main transmission channels to financial crises.

4.3 The Role of Balance Sheets and Volatility of Flexible Exchange Rates

We showed so far that, capital account reversals may occur in a developing economy, irrespective of the exchange rate regime implemented and they are mainly dependent on the external interest rates, return spreads and the presence of safe havens. So, a country with a flexible exchange rate regime may also face capital account shocks in the form of sudden stops, which is primarily derived by external factors. In this section, we will investigate the factors that transmit sudden stops into financial crises. We will denote that the choice of an exchange rate regime does not much affect these channels and these factors are still viable under flexible exchange rate regimes.

In discussing the three generations of crises models in chapter 2, we indicated that once capital account reversals hit a country, this leads to a sudden devaluation in fixed exchange rates. And due to high foreign currency debt burdens and high balance sheet mismatches in developing economies, a huge devaluation ends up with loss of wealth in the companies with high external debt, bankruptcies and financial crises. Hence balance sheet mismatches play an important role in translating capital account reversals into financial crises under fixed exchange rate regimes.

Similar situation may happen in the countries with flexible exchange rate regimes, after a capital account shock. Flexible exchange rates react to capital account shocks with a depreciation. And if the depreciation is large enough, this would lead to financial crises under flexible exchange rate regimes too via balance sheet mismatches and excessive foreign currency debts of developing economies. Hence, in this section, our focus will be on that a large depreciation after a capital account shock may transmit into a financial crisis under flexible exchange rate regimes. For this, initially we will look at the association between balance sheet mismatches and financial crises. Later on we will investigate whether balance sheet deterioration takes important place in the countries using flexible exchange rate regimes.

4.3.1 Balance Sheet Mismatches and Financial Crises

We indicated in the previous section that developing economies are mostly unable to borrow from external markets in domestic currency. They even have difficulty to borrow from domestic markets in their own currency. This is named as "original sin" of developing countries by Eichengreen and Husmann (1999). The reasons for a developing country to experience the problem of original sin are persistent high inflation rates, the past experiences of devaluation and depreciation in the exchange rates, fragile financial systems and weak monetary policies. Foreigners are unwilling to lend in the local currency of the borrower, because a prospective depreciation in the exchange rate causes the real value of their receivables to decline, hence developing economies have to borrow foreign currency denominated debt from abroad. In addition, the history of high inflation in developing economies discourages residents to hold their savings in domestic currency because their real wealth declines with inflation when they continue to hold domestic currency savings (Honohan & Shi, 2002). Hence the dependence of developing economies on foreign currency denominated debts eventually lead the liability side of the balance sheets to be denominated in foreign currency, mostly dollar.

Externally funded firms hold foreign currency cash commitments; residents store foreign currency deposits in financial intermediaries and depository banks keep

international loan commitments in foreign currency. In this sense, the significant portions of liabilities in developing economies are comprised of foreign currency denominated liabilities. This situation is called as "liability dollarization" in the literature (Calvo, 2002). Liability dollarization creates a currency mismatch problem in balance sheets. Currency mismatch in a broad sense is defined as the differences in the values of foreign currency denominated assets and liabilities on the balance sheets of households, firms, the government and the economy as a whole (Eichengreen, Hausmann & Panizza, 2003). For the case of a bank, if foreign currency liabilities exceed the value of foreign currency assets, the currency mismatch takes place. In order to eliminate this mismatch, banks hold foreign currency denominated assets and aim to decrease their foreign currency exposures. However, this brings about another significant risk. Banks targeting lower foreign currency exposures issue foreign currency loans to lessen their risks. This would bring about further vulnerability, which is called credit dollarization. Even though the foreign currency assets of the banks seem to be increasing and banks technically reduce their currency risk on their balance sheets, foreign currency loan holders increase their own currency risks (Allen et. al., 2002). In other words, banks substitute the deposit currency risks with another currency risk in the economy, which is called credit dollarization. As a whole, a developing economy faces a full dollarization problem and currency mismatches due to their inability to borrow in their domestic currency (original sin).

Dollarization carries serious risks for a developing country. Financially dollarized economies display monetary imbalances and a greater propensity to suffer banking crises after the depreciation of domestic currency (Yevati, 2006). In case of a sharp real depreciation of the currency, the domestic currency values of foreign liabilities soars sharply, which in the end leads to defaults on these liabilities and financial crises. Even in the case of balanced foreign exchange positions of banks, the extent which the dollar loans are not repaid could create significant mismatch problem and financial crises[32]. Allen et. al. (2002) argues that almost all crises episodes in emerging markets are associated with dollarization and currency

[32] In the following parts, we will elaborate on the incidence of financial crises even under the sound balance sheets of financial institutions.

mismatches. Caballero and Khristnamurthy (2003) find out that dollarization amplifies the potential downturns in economic activity by increasing the cost of exchange rate depreciations for policy makers. Calvo, Izquierdo & Mejia (2004) state that the potential damages after the sudden stops in a country increase with the higher levels of liability dollarization. Yevati (2006) estimated the probability of banking crises with the incidence of currency devaluation and indicators of deposit and credit dollarization. He found a strong support that dollarization together with the exchange rate volatility increase the likelihood of banking crises in an economy.

The empirical results from past crises episodes in developing economies demonstrate that most of the crises-hit countries experienced significant dollarization and balance sheet mismatches before the crises. Figure 4.15 represents that foreign currency liabilities sharply increased by almost multiple of four or five in some Asian economies (Indonesia, Korea, Malaysia, Taiwan and Thailand) prior to Asian crisis. And except for Taiwan, the boom in the foreign liabilities contracted after the financial crisis, because foreigners became unwilling to lend to these crisis-hit economies. In Figure 4.16, we may observe the similar situation in Turkey during the financial crisis in 2001-02. From the 1990s to 2000, dollarized liability position of the Turkish financial sector had increased significantly from 20% to above 50% of total liabilities. This led foreign currency exposure of the balance sheets to soar. And after the great devaluation in February 2001, due to this extremely high level of foreign currency denominated liabilities, financial institutions lost significant financial wealth, they went to bankruptcy and a severe banking and currency crisis hit the country.

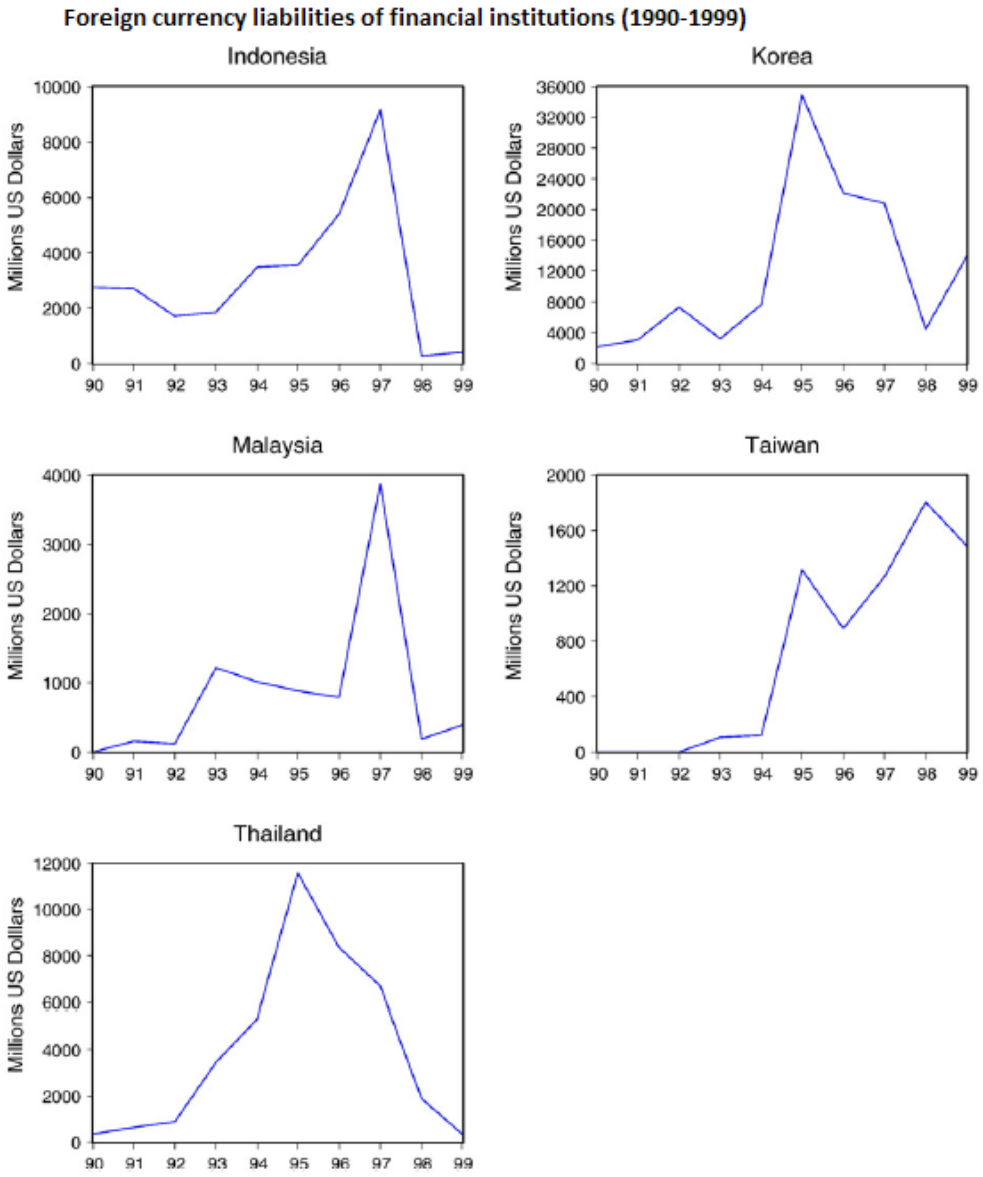


Figure 4.15 : Liability dollarization in the financial institutions in selected Ssean countries in 1990s. Source: Chue and Cook (2008), and IFS

The debates in the literature and the episodes of financial crises hit developing countries in the past and the related discussion in the literature clearly indicate that currency denomination of the balance sheets has a crucial role in developing country financial crises. The significant factor in these episodes is that these countries having a serious dollarization problem had been using pegged and quasi pegged exchange rate regimes, which they officially didn't allow the rate to fluctuate much. Now the question is could we observe balance sheet mismatches and excessive dollarization under flexible exchange rate regimes? And could a country

with flexible exchange rate regime face a financial crisis which is mainly transmitted and aggravated by the bad foreign exchange positions of the balance sheets?

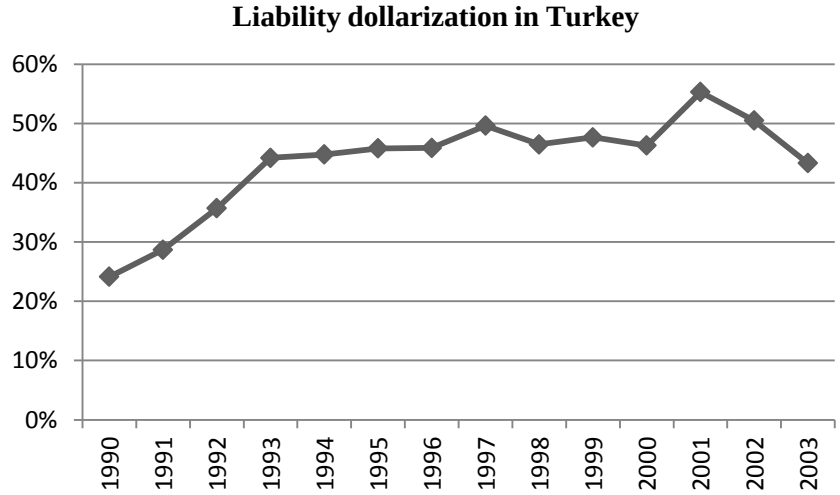


Figure 4.16: The share of foreign currency denominated liabilities of deposit banks in their total liabilities. Source: CEIC and CBRT (Central Bank of Republic of Turkey)

4.3.2 Balance Sheet Mismatches Under Flexible Exchange Rate Regimes

The literature principally blames fixed exchange rate regimes for encouraging dollarization in financial accounts. The rationale of this blame is that fixed exchange rates are in a form of guarantee that the rate will not fluctuate much in the future. And this gives an incentive to financial institutions, private companies and even households for holding foreign currency liabilities because these economic agents believe that fixed exchange rate is a natural hedge against devaluations and loss of wealth. Hence the dominant view in the literature is that high dollarization and currency mismatches are more prevalent and riskier under pegged exchange rate regimes (Burnside, Eichenbaum & Rebelo, 2001; Goldstein, 2002; Mishkin, 1998). And this literature suggests that floating exchange rate regime is the best option for eliminating dollarization and balance sheet related financial crises (Chang & Velasco, 2000; Goldstein, 2000). Their rationale is that under flexible exchange rate regimes, institutions need to hedge against currency risks due to the volatile nature of flexible rates hence firms and banks have higher incentive to hold foreign currency assets to lessen their exposure. Allen et. al. (2002) quotes that:

> Countries with floating regimes are often better equipped to withstand external shocks. Not only can the exchange rate adjust to a shock, but the absence of expectations for stability in the nominal exchange rate limits incentives for the accumulation of excessive currency risk on sectorial balance sheets (p.21).

Contrary to this prevailing argument, there is also small literature which claim that currency mismatches may be observed under flexible exchange rate regimes (Eichengreen & Hausmann, 1999, McKinnon & Schnabl, 2004). They argue that greater flexibility increases the cost of insurance against the currency risk and encourages less hedging. Hence they assert that high currency mismatches and dollarization may occur under flexible exchange rate regimes (Arteta, 2005).

Even though the literature mainly blames fixed exchange rates for the dollarization of economies, we believe that dollarization of the balance sheets are not a direct result of the exchange rate regime chosen. And dollarization and currency mismatches could be at high levels in flexible exchange rate regimes too. Our rationale is that due to the volatility and high probability of depreciation in flexible exchange rates, domestic fund holders seek to hold foreign currency deposits in order to insure themselves against currency risks. And the depreciation in the value of a domestic currency could result in similar contractions as in the case of fixed exchange rate devaluations via the dollarized balance sheet channel.

The case for Mexico perfectly represents this situation (Figure 4.17). In 1995 after the collapse of peso, Mexico began to use flexible exchange rate regimes. When Mexico was under fixed exchange rate regime, the deposit dollarization of Mexico was about 3-4 %. After the implementation of a flexible exchange rate system, the dollarization did not decrease but even accelerated to about 10 percent levels. (Also note that in 1994, before the Tequila crisis, there was a sharp increase in the dollarization.) Furthermore, an external disturbance made Mexicans to hold more dollar deposits: In 2001 during the Argentinian crisis, as can be seen from Figure 4.17 that there was a sharp increase in the foreign currency deposits of Mexico. The crisis in Argentina led the residents of Mexico to hold more foreign currency deposits for the search for safe havens. This implies that, even an external shock may make the residents fear for a future depreciation in flexible exchange rate regime and shift their portfolios to foreign currency. Hence the foreign exchange exposures of

balance sheets could easily deteriorate under flexible exchange rate regime due to the probability of a future depreciation.

Figure 4.17: The share of foreign currency denominated deposits in total deposits of commercial and development banks (1990-2011). Source: Banxico

An interesting case happened in Turkey in the second half of 2011, when the dollar was appreciating globally in almost all emerging markets. This made a small depreciation pressure on developing country currencies including Turkey. In Turkey, starting from May 2011, the depreciation against dollar was nearly 12 % percent in 6 months. Even if this fluctuation in flexible exchange rate was very small, residents started to hold more foreign currency deposits and funds (Figure 4.18). And in 2001, deposit dollarization increased by 5 % in Turkey, which is a liability currency risk for banking institutions. This shows that even a small depreciation pressure made residents to head towards dollar deposits under flexible exchange rate regimes in a very short time, which increases the foreign exchange exposures of banks and deposit holders. Hence this example also indicates that depreciations could aggravate the dollarization under flexible exchange rates. And if the safe haven impact gets bigger with robust financial atmosphere in industrial economies, the exposures may become even larger and may transform to a financial crisis.

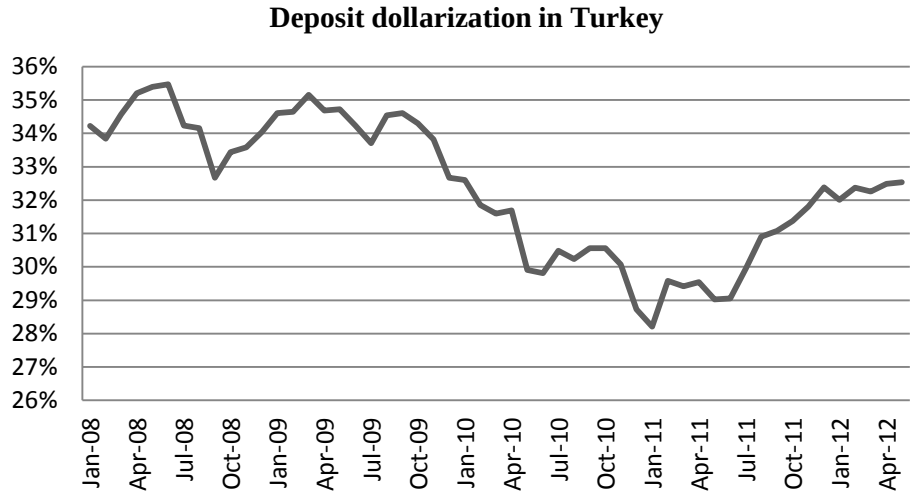


Figure 4.18: Dollarized deposits are holdings of foreign currency denominated deposits and funds in the banking institutions in Turkey. The figure represents the share of dollarized deposits in total deposits. Monthly data covers the period of 2008 – 2012. Source: CEIC and CBRT.

Therefore, the fluctuations in the exchange rate can be considered as the main determinants of the dollarization in balance sheets in the countries with flexible exchange rate regimes. Furthermore, under flexible exchange rate regimes, even a small depreciation may deteriorate balance sheets. If the depreciation pressure rises, the incentive for holding foreign currency funds and assets increases. For this reason, the policymakers in most developing economies have objective to restrain the large movements or volatilities in the exchange rate.

4.3.3 Volatility and Fear of Floating

We showed that the depreciation in flexible exchange rate may create serious dilemmas for a developing economy. It increases the dollarization in the balance sheets, raises the value of already dollarized debts and may be a source of a financial crisis. Besides these, a high appreciation movement in the exchange rate could lead to some other risks which are undesirable for the policymakers in developing countries. After a surge of massive capital inflows in a country, steep and abrupt movements in the real exchange rates occur (Reinhart & Reinhart, 1998). In fixed exchange rate regimes, real currency appreciations occur via high inflation rates. In flexible regimes, real appreciation happens via the increase in nominal

exchange rates usually. Real exchange rate appreciation emanating from large capital inflows damages the competitiveness of economies in their export sectors. Their trade balance deteriorates and most of the time current account deficits ensue. Since current account deficits require constant foreign currency financing, foreign capital should persistently move into the country. As further external capital comes in, this results in further appreciation. The expectation of a future appreciation makes more foreign investors to invest in appreciating currency, due to high profit expectations (Mohan & Kapur, 2010). And continuing appreciation attracts more foreign capital to the appreciating currency. As we discussed earlier in this thesis, increasing capital inflows or hot money are risky and make the financial system more fragile to financial shocks and a sudden stop in these inflows would result in financial crises. For this reason, persistent real exchange rate appreciations are associated with financial crises and found to be early warning of a prospective crisis by economists[33] (Frankel & Rose, 1996; Goldfajn & Valdes, 1996). Kaminsky (2003) notes that a 40 percent appreciation could itself signal a future crisis and if accompanied by excessive international borrowing a 10 percent real appreciation could be enough to signal a crisis. He further claims that real exchange rate appreciations are the most important signal of a forthcoming crisis. Hence, due to its harm to export sector and current account balance, appreciation of the currency is politically undesirable for developing countries, which have not, in general, diversified export sectors. Figure 4.19 exhibits the movement of real exchange rates in Mexico, Argentina and Turkey prior to their financial crises. The graphs in the figure show that all currencies had significantly appreciated in real terms from 3-4 years before the crises hit. This indicates that there is a strong association between real exchange rate appreciation

[33] Sometimes, countries voluntarily choose to allow the currency to appreciate for the purpose of controlling the inflation rate. For the recent decades, it is evident that some countries preferring this policy has been successful in moderating inflation rates. However, this leads to a trade-off between choosing low inflation and bad current account balance. Some developing countries choose to prevent the real exchange rate appreciation, even promote the depreciation, in order to be competitive in foreign trade sectors. However, since most of the emerging markets' industrial sectors are dependent on imported raw materials and technology, this would immediately reflect on price levels. Firms have to pay higher prices for their imports. Also the depreciation increases the demand for domestic export goods, leading to upward pressure in the inflation as well. This leaves the economy a similar trade-off; Good current account situation or high inflation. What's more, in this scenario, current account improvement may not be sustainable because in longer term, high inflation leads to real exchange rate appreciation and this means worsening of current account. Hence volatility of the exchange rate creates a dilemma between inflation targeting and current account balance.

and financial crises. These economies had been using pegged exchange regimes at that time and so appreciation was caused by mostly price increases. However, in flexible exchange rate regimes, due to its volatility nature, it happens mostly due to nominal exchange rate appreciations after capital inflows. The mechanism is different, but the impact of the real appreciation is similar in both regimes. As real appreciations in fixed exchange rate regimes due to price increases generally end up with financial crises, the real appreciations in flexible regimes due to nominal exchange rate movements could result in financial crises as well.

Real Exchange Rates prior to the crises of Developing Economies

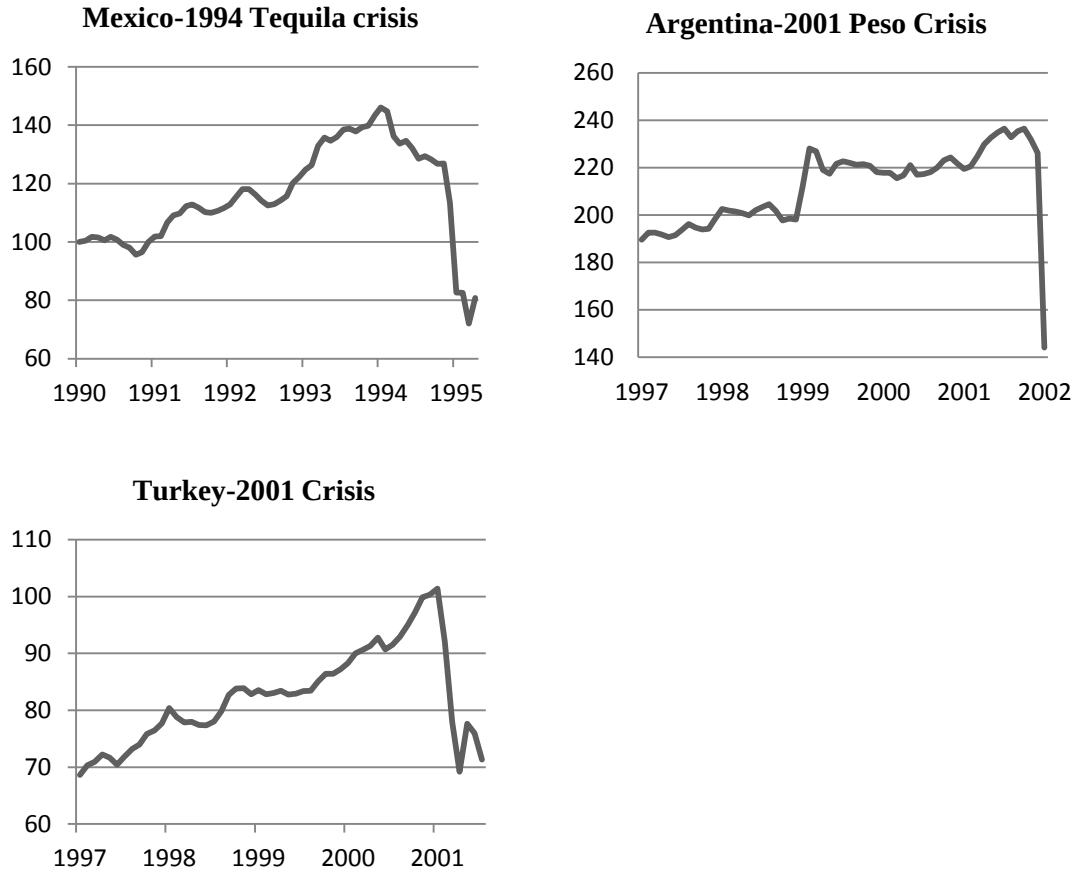


Figure 4.19: The movement of real exchange rates in Mexico, Argentina and Turkey during their financial crises years. The data is monthly. Sources: BIS and Banxico

For the reasons above, abrupt movements in either direction in the flexible exchange rate have adverse economic consequences and may be a triggering factor in a forthcoming financial crisis. Large volatility in sudden and substantial exchange rate movements constitutes an important channel through which capital flows can potentially have an adverse impact on the domestic economy (Mohan & Kapur,

2010). The risks associated with the volatility of exchange rate make the monetary authorities reluctant to let the exchange rate move too much. This argument is called as “Fear of Floating” by Calvo and Reinhart (2000). In the words of Hausmann, Panizza and Stein (2001); “as the importance of foreign currency debt increases, the central bank will optimally choose less exchange rate flexibility” (p.389). Because central banks are fearful of volatility, they occasionally engage in foreign currency interventions or play with interest rates to keep the rate under control. And interventions are believed to protect the economy from large fluctuations in the exchange rate and hence eliminate the crises. This has actually no difference from interventions in fixed exchange rate regimes to protect the peg. However, the objectives of exchange rate stability and intervention in the foreign exchange market have shortcomings too, and could lead to other financial fragilities.

In case of a large sudden stop, in order to limit a high depreciation, the central banks either drain the liquidity by injecting foreign currency to the market or increase the interest rates to very high levels to sustain foreign funding. The illiquidity problem and high interest rates in the domestic market induce firms and banks to face high costs of funding. And during the crisis we observe that developing country economies increase the interest rates to record levels to prevent the run from the currency and devaluation. In flexible exchange rate regime, after a shock, interest rates soar as well in order to prevent depreciation. And if the sudden stop is very large and depreciation pressure is serious, the upward movement in interest rates becomes very large as well. This would result in sharp decline in investment projects and trigger a financial collapse. Firms could not take further credits from banks, and some of them may default on their debt commitments. This may end up with financial crises in flexible exchange rate regimes.

Central banks also intervene to limit the excess real appreciation of the currencies to impede the occurrence of the serious current account deficits. However, the interventions to control the upward movement of the exchange rate could not also completely eliminate the financial risks in an economy. A central bank operating under a flexible exchange rate regime intervenes in financial markets by purchasing foreign exchanges to stop appreciation. As we will see in the following section, this leads to accumulation of foreign exchange reserves and increase the domestic

liquidity. The excess liquidity may cause excess credit expansions and over-heating in the financial system. Financial system becomes more fragile with excess liquidity because credit expansions bring about moral hazard problems. And as we will see in the section on the credit expansions in this chapter, in case of a default on credit debt whole financial system could be severely damaged. Hence, the protective measures against the volatility in the exchange rate may not be fully effective in preventing the financial fragilities and crises.

The high volatility of flexible exchange rates has also implications for interest rates in developing countries[34]. To take exchange rates under control, monetary authorities occasionally play with interest rates. In times of large capital inflow surge, they decrease interest rates to avert an unexpected appreciation and in times of sudden stops they raise the interest rates to avert the damages of depreciation. Hence, the need to manage the exchange rate would result in higher interest rate volatility under flexible exchange rate regimes than fixed regimes, because central banks should frequently play with interest rates to stabilize exchange rates. Interest rate volatility coupled with exchange rate volatility has negative consequences for an economy and would lead to further financial fragilities in financial systems. The phenomenon of interest rate volatility complicates the development of long-term bond markets since they have unstable prices in case of a high volatility in interest rates (Eichengreen & Haussman, 1999). Instability in long-term bond markets may give an incentive for holding short-maturity debts to domestic borrowers. This would heighten the maturity mismatch risk faced by domestic firms and increases the

[34] The conventional belief is that under fixed exchange rate regimes monetary authorities lose autonomy on the monetary aggregates. In addition, flexible regimes are believed to grant the monetary authorities a greater degree of independence and permit them to exercise more control over the monetary aggregates (Reinhart & Reinhart, 1998). We believe that this argument is misleading. Because under the dominance of foreign currency debts and credits in the balance sheets, a volatile exchange rate is dangerous for developing economies. In other words, "fear of floating" makes central banks to prevent their exchange rates from getting out of control. This makes a "so-called" floating rate to move around some levels in a band. We call this as "implicit exchange rate peg" To take the exchange rate under control; monetary authorities occasionally play with interest rates. In times of large capital inflow surge, they decrease policy interest rates to avert an unexpected appreciation and in times of sudden stops they raise policy interest rates to avert the damages of the depreciation. Therefore, we may claim that implicitly interest rates are not under the control of the domestic authorities in flexible exchange regimes too. In fact, the decisions on monetary aggregates are determined by the agents who are active in foreign exchange markets. Contrary to the traditional belief in economic theory, this implies that developing economies do not have full autonomy in their monetary policies even under flexible exchange rate regimes,

probability of the occurrence of a financial crisis. Also uncertainty in interest and exchange rates would lead investors to demand for higher return on their domestic currency investments. This would both increase interest rates further and hence the cost of funding investment projects.

Even though we believe that flexible exchange rates lead to more volatility in the interest rates, the movements of interest rates in the flexible exchange rate regimes and its financial and macroeconomic implications should be analyzed in a more detailed way both theoretically and empirically. However, for the time being this is beyond the scope of our thesis and left the discussion for other researchers. Our point for this argument is that the volatility of both exchange and interest rates may play an aggravating role in the prospective financial crises under flexible exchange rate regimes.

All in all, the volatile nature of flexible exchange rates is a source of financial fragility and the shocks emanating from these fragilities may bring about financial crises. Furthermore, we pointed out that interventions by central banks to control excess volatility could not be very effective in removing the fragilities of the financial system. Even if we assume that large fluctuations can be eliminated by interventions, this may give birth to excess liquidity (resulted from attempts to avoid appreciation) and illiquidity (stemmed from attempts to avoid depreciation) risks in the market, which may turn into financial crises depending on the extent of the shocks. In Figure 4.20, we can see the summary of how volatility of exchange rates and interventions to control them could lead to financial fragilities.

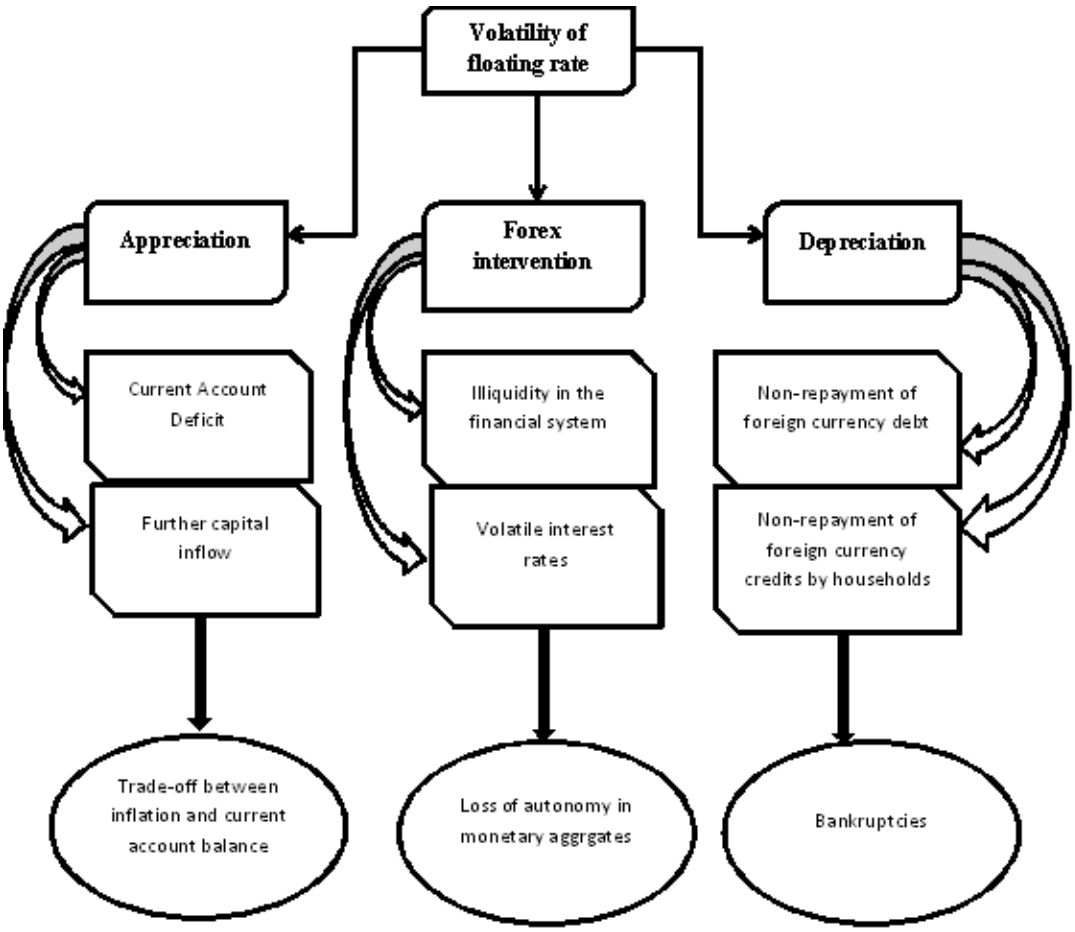


Figure 4.20: Summary of the fragilities which volatile exchange rates cause. Volatility is the result of appreciations and depreciations in the flexible exchange rate. Also the fragilities sourced by foreign exchange (Forex) interventions are depicted in the figure.

In this section so far, we emphasized two significant factors which may play a crucial role in the incidence of financial crises under flexible exchange rate regimes: The dollarization of the balance sheets and the volatility of flexible exchange rates. Now, we will elaborate on the effectiveness of hedging in eliminating these risks under flexible exchange rate regimes.

4.3.4 Foreign Currency Hedging

We argued, up to this point in this section, that the dollarization of balance sheets coupled with the volatility of exchange rates may give serious damages to the financial system of a developing country. However, there is one counter-argument

that volatility and hence currency risks could be eliminated by financial innovations like foreign exchange hedges. The advocates of this thesis claim that fixed exchange rates give implicit guarantee that the rate will be sustained over long-time and it conveys less foreign exchange risks. According to them, due to this implicit guarantee, corporates do not resort to hedging instruments. Goldfajn and Olivares (2001) discuss that managed exchange rates invite excessive speculations, induce private agents to take unhedged positions. Burnside, Eichenbaum and Rebelo (2001) claim that fixed exchange rates lead to more original sin problem, convey the impression that the government gives a guarantee of the sustainability of the peg and encourage the private sector to accumulate unhedged positions. Nevertheless, according to their arguments, flexible exchange rate regimes are more volatile and incorporate higher risks of uncertainty. Hence hedging methods are used extensively in flexible regimes, which partially eliminate foreign currency exposures of the balance sheets. Domaç and Peria (2003) quote; "under pegged regimes, borrowers have little incentive to hedge their foreign exposures. On the other hand, exchange rate risk under flexible regimes promotes hedging and helps to curb inflows" (p.44).

We believe that this assertion is open to debate and has some shortcomings. Initially, foreign currency risks in the whole economy cannot be eliminated if the country is bound to hold debts denominated in foreign currency. Some firms may hedge their exposures, and may become riskless; however, the risks go to other institutions which provide hedging. However, overall currency risk of the country will not be eliminated. Eichengreen and Hausmann (1999) argue that if the country has to borrow abroad only in foreign currency, by definition the country's overall net foreign exchange exposure must be unhedged. The risks of hedged companies are automatically transferred to hedge fund companies, and overall risks of a country never become zero. For example in the recent global financial crisis, several hedge funds went into bankruptcy. The large hedge funds of Bear Stearns, JP Morgan and Lehman Brothers companies in the US lost extensive value and these default funds are blamed by many for deepening the crisis (Mishkin, 2010). The collapses of several hedge funds during the global financial crisis clearly depict that hedging does not eliminate all the risk and it indeed may create its own risks.

The simplest form of hedging application for firms and banks is holding sufficient foreign currency assets to balance the foreign currency liabilities. There are two traditional ways of doing this: One is that countries need to do this by selling their domestic currency liabilities to others. However, foreigners are reluctant to buy these liabilities, since they are denominated in the currency of developing country debtor. The only way for the firms, is selling domestic currency liabilities to other domestic institutions. Now the risk is transferred to others who purchase these liabilities in the domestic market. Another method for balancing the foreign currency exposures is that banks issue higher amounts of foreign currency loans to private sector and households. In this case, even though the books of the banks seem balanced, the currency risks go to the holders of these loans. Since many domestic firms and households mostly rely on domestic currency income, the foreign exchange risk exposure passes through these agents. And in case of a default on these loans due to depreciation or a rise in interest rates, the banks' balance sheets deteriorate and become exposed to a significant currency risk. Eichengreen and Hausmann (1999) give a nice description for these two cases: "they can pass their exposures around like a hot potato, but they cannot eliminate them." Since the hot potato is still the in the boundaries of the country, the aggregate net foreign currency exposure of the country is still alive. Hedging may provide some safeguard for some firms in an economy, but it just does this by transmitting the exposure to other domestic institutions. Therefore, the fact that a country has to hold large debt burden in foreign currency implies that the country is naturally unhedged.

Furthermore, the cost of hedging increases as the volatility of exchange rates increases. An increase in volatility means the risks associated with currency increase too, and hedging against these higher risks become more difficult. Since higher risks require that insurance against them must be costly, the hedging against the volatility risks of flexible exchange rates must be more expensive. As the volatility increases, we may expect that the incentive for hedging may decline too, since it is more costly now. For this reason, contrary to prevalent view, under flexible exchange rate regimes, we may observe significant amounts of unhedged exposures.

The conclusion is that even if we are not sure whether hedging is more prevalent under flexible regimes, full hedging is impossible given that the developing

country is bound to hold foreign currency debt, aggregate foreign currency risks of an economy cannot become zero[35]. Also since under flexible regimes it is expected that hedging is more complex and expensive process, many institutions may choose to remain unhedged against risks. So when a speculative attack hits a country with flexible exchange regime, hedging against the foreign currency exposures may not be sufficient to prevent a financial crisis. However, as we mentioned, this issue requires further detailed analysis.

4.3.5 Sustainability of Good Balance Sheets

We have already shown in the above discussion of this section that badly managed and mismatched balance sheets were vulnerable to any internal or external shocks. And these shocks can lead to financial crises under flexible exchange rate regime too. Now the question is, if the balance sheets of banks or firms seem sound, does it mean that the country wouldn't experience any financial crises? If the books of banks and firms are decontaminated from large currency and maturity mismatches, do we expect that the country is safe from financial turmoil?

The answer lays behind the fact that in today's highly internationalized financial system in which agents have strong interconnection, a shock to an agent could spill over to other players, even though the other players are in a sound position. Hence we may assert that even if the properly managed balance sheets decrease the probability of crises, good balance sheets are still vulnerable to financial shocks. Today, financial systems in most emerging markets are highly leveraged and complex as well as fragile and a small shock to a financial player could dampen the whole financial system. Dornbush (2001) emphasizes that:

> It is also important to recognize that a banking system's situation can change dramatically in a very short time. This easily happens when a

[35] Nevertheless, the issue of hedging under flexible exchange rate requires a more detailed analysis in the literature and this analysis is beyond the scope of this thesis. The existing literature lacks adequate empirical and theoretical work on the measurement of the usage of hedge methods in developing countries due to inadequacy of data on hedging. The detailed studies on hedging should focus on the roles of future contracts, options, currency swaps and similar hedging tools in decreasing the currency risks and their effectiveness under flexible exchange rate regimes. For the time being, we gave a general framework about the applicability of hedging instruments in preventing balance sheet risks and financial crises under flexible regimes.

> concentration of liabilities (say, real estate loans) becomes bad, or a spell of high interest rates causes a general deterioration of a loan portfolio that had been only slightly above marginal (p.5).

For example, banks may properly hedge their risks and mismatches; however, they cannot have full control on their loan customers. The loan customers may experience a mismatch in their balance sheets and have difficulty to pay their loans. In this case, banks' reserves melt down; and even the banks with sound balance sheets may not cover their liabilities. This is what exactly happened in the US in 2007 at the outset of the global financial crisis. Till that time, banking sector balance sheets used to be sound in the US. Also, since the U.S is the provider of the global liquidity of dollar, it could easily borrow externally in dollar and hence currency mismatches and foreign exchange exposures were impossible for the balance sheets in the U.S. However, the collapses occurred in the mortgage market, triggered a sharp deterioration in the balance sheets and end up with bankruptcies. Even if the banking system seemed to be not weak, the non-repaid credit lines by the households triggered a chain of events from bank runs to global financial crisis.

Hence increasing amounts of loans held by households are a source of a financial risk, because they are almost unable to hedge their risks and in case of a sudden shock they may default on their loan commitments. If this is aggravated by a systematic non-performance of loans by the households, asset side of the balance sheets is undermined even though a significant mismatch does not exist in the balance sheets before the household collapse. Hence, rising household loans as a share of total credits or assets in a developing economy could mean a decrease in the probability of sustaining good balance sheets. We present the share of household credits in total assets of the banking system in some developing economies using flexible exchange rate regimes in Figure 4.21. The very high rates in Turkey, South Africa, Chile and Colombia which are above %20 indicate that significant share of their assets consists of the credits issued for households. Hence this implies that the banks in these economies rely on the repayment of these loans in financing almost one fourth of their liabilities. This would be a serious concern when these loans are non-performed. The graphs in the figure show that rising portion of banking assets are allocated to households who are generally unable to hedge their risks.

Share of Household Credits in total Assets of Banking Sector

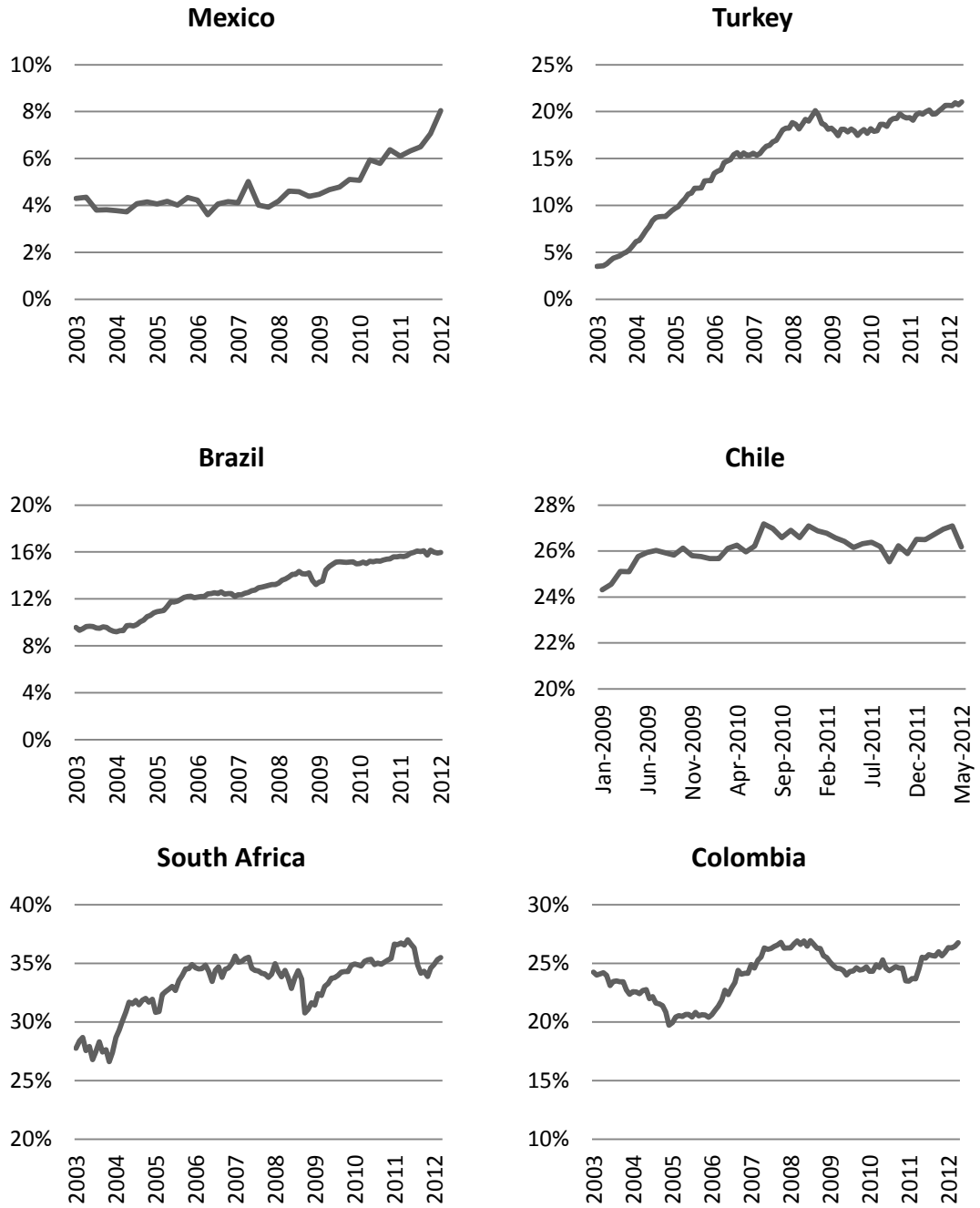


Figure 4.21: Domestic credit provided by banking sector to the households as a share of the total assets of the banking sector. Graphs show that, a mojor part of assets are financed by household credits and the share has been increasing over time in reported countries. Sources: CEIC and National Central Banks

Furthermore, banks accumulate foreign currency assets to match their foreign currency debts. However, in developing countries some of their foreign assets take the form of dollarized loans raised to domestic customers. In case of depreciation,

these customers may experience currency mismatches in their portfolios and cannot repay their loans since their income is mostly denominated in domestic currency. Also a high portion of liabilities of developing country banking system are financed by international loans from foreign banks. Hence a substantial cut in deposits or a halt in the international interbank loans to the domestic banks could lead to liquidity problems even in the banks without any prior balance sheet problems[36]. Furthermore, depreciation in the flexible exchange rate leads the domestic value of these international loans to soar and significant debt problems.

Our conclusion from this part is that, international financial system is so complex today and even small shocks to a country may end up with financial crises in another country. Mishkin (2010) in his analysis on the systemic risks during the global crisis states; "the global financial system is far more interconnected than was previously recognized and excessive risk taking that threatened the collapse of the world financial system was far more pervasive than almost anyone realized." Hence, given the natural fragility of financial systems today, sound balance sheets are under a risk as well. And irrespective of exchange rate regime, financial crises may occur in economies even with well-managed balance sheets. The tools of flexible exchange rate regimes may not be adequate to avert these systemic shocks.

Up to now in this section, we focused on how balance sheet mismatches together with the risks coming from the volatility of exchange rate could play a role in a possible financial crisis under flexible exchange rate regime. We concluded that a significant depreciation could have similar impacts on balance sheets as the devaluations in pegged exchange rates. And also nominal appreciations lead to real currency appreciation in flexible exchange rate regimes and the impacts are similar to real overvaluation of fixed exchange rates. Lastly, we mentioned that hedging methods could not eliminate the financial risks of flexible regimes and even under sound balance sheets we may observe a flexible exchange rate crisis. Now, in the upcoming section, we will turn our attention to another policy tool which is prevalently used by developing economies in recent years together with the flexible exchange rate regime. This is the accumulation of foreign exchange reserves in order to provide cushion against financial shocks.

[36] Detailed discussion of the roles of international roles is left for the fifth section in this chapter.

4.4 Reserve Accumulation Policies

Foreign exchange reserve accumulation has been a significant policy tool for many emerging markets recently. Specifically for the recent two decades, many economies in the world have accumulated huge amount of foreign exchange reserves. The accelerated pace of reserve accumulation was profound in the 2000s in emerging markets. Particularly, after the South Asian crisis of 1997-98, emerging markets have started to accumulate foreign exchange reserves. The accumulated reserves in all developing countries were already presented in chapter 3 (see Figure 3.22). The share of total central bank reserves of developing economies to their GDP was, on average, 6% in the 1990s, however; the share reached, on average, %20 in 2007.

The main motivation of countries for accumulating foreign exchange reserves is providing cushion against sudden stops in capital account. By holding large reserves, in case of an attack, countries become ready for injecting foreign exchanges to the market. This would prevent large devaluations after speculative attacks and provide precautions against financial crises. This self-insurance motive has given rise to belief that huge amounts of reserves are protective factors against currency crises (Flood & Marion, 2002)[37]. As could be seen in the three generations of crises theories of chapter 2, the countries under fixed exchange rate regimes need large

[37] The literature explains the motivations of countries for reserve accumulation under three different headings. According to the literature the first motive, as explained in the text, is the precautionary motive against the financial crises. The second one is the mercantilist motive aiming to prevent the currency from a real appreciation. According to this motive, central banks periodically purchase foreign currency in the market; hence accumulate reserves, to increase the value of foreign currencies in terms of domestic currency. The objective is to prevent the real appreciation of the domestic currency so that the country stays competitive in their export sector. By allowing real exchange rate depreciation, some countries try to keep their export prices cheaper and target a sound current account position (Aizenman & Lee, 2007). The last motive behind a reserve accumulation policy is policy autonomy motivation. According to this approach by holding reserves countries wouldn't be dependent on IMF or other foreign monetary supports in case of speculative attacks or financial crises. Countries would provide their own resources to alleviate the shocks and prevent the intervention of international institutions. Therefore some countries see the reserve accumulation as a tool to increase policy independence or sovereignty (Cruz & Walters, 2008). Even though the literature explains the motivations under three different categories, the basis for these there motives for reserve accumulation is same; preventing large swings in the exchange rate and providing cushion against capital flights.

amounts of reserves to defend the pegged exchange rate[38]. According to these theories, since countries were not able to hold sufficient reserves, many fixed currencies in developing economies collapsed and several currency crises occurred (see chapter 2).

However, as seen in chapter 3, after the 2000s countries' international reserve levels of many developing economies have boomed. This spectacular rise in reserves occurred in a period that many emerging markets have begun to shift from currency pegs to flexible exchange rate regimes. The common wisdom related with the reserve accumulation concept is that reserves are inevitable phenomenon of fixed exchange rate regimes. However, surprisingly, the emerging markets accumulated the highest amount of reserves of the history, in the times when they had flexible exchange rate regimes. A flexible exchange rate means the exchange rate should be allowed to be determined by supply and demand factors in exchange markets. Theoretically, the countries with floating rates shouldn't have a motivation for controlling the fluctuations in the exchange rate. However, even in this flexible exchange rate world, many countries have accumulated international reserves at record levels that are much higher than they used to have under fixed exchange rate regimes. Henceforth, one may reach a conclusion that emerging markets are safer than the past. And we demonstrated in the third chapter that many scholars and policymakers attribute the stability of developing country financial markets in the 2000s, to a great extent, to the large accumulation of foreign exchange reserves in developing countries in the recent decade (see section 3.5 in the third chapter).

In this section, we will question this argument and try to show that emerging markets still possess some other risks. Initially, we explain that even though international reserves in developing countries reach enormous levels, the huge levels may not be adequate for some countries to prevent financial crises. Hence, first we will analyze the adequacy of foreign exchange reserves in developing economies. Then, we claim that reserve accumulation strategy is itself very costly and possesses some financial risks. Hence, secondly we will present the possible problems which can take place under the reserve accumulation strategy regimes will be presented. We

[38]We also mentioned in the Heteredox financial crisis theories that countries need to accumulate reserves to cover their external debt commitments and to protect themselves from falling into Ponzi finance (see chapter 2)

will conclude the section by pointing out that the countries with large foreign reserves and flexible exchange rate regime could witness a financial crisis as well, if the structural problems of the financial systems in developing countries are not eliminated.

4.4.1 Adequacy of Foreign Exchange Reserves

As reserves have been built up, what levels of reserves are adequate in order for it to be effective in preventing financial crises has been an important question among economists. An adequate stock of reserves is assumed to finance the gaps between payments and receipts of foreign currency, to smooth out external payment imbalances, to control the fluctuations in exchange rate and to prevent an exchange rate crisis (Cifarelli & Paldino, 2006). The amount of adequate reserves may vary with respect to the objectives of a country. If the country wishes to keep the exchange rate stable, a higher load of reserves are required to successfully implement foreign exchange interventions and prevent unexpected depreciations. Provided that a country aims less stability and wishes to allow appreciation or depreciation in its currency, a lower amount of reserves could be adequate (Williams, 2006). Theoretically, we should allege that a country implementing purely floating exchange regime should hold zero or very low levels of international reserves. Because purely floating exchange rate is believed to clear the market by increasing or decreasing the rate in case of changing market demand for foreign currency. Nevertheless, developing economies today, by a majority, implement flexible exchange regime on surface, while keeping the rate at stable levels. This is because, as mentioned in the previous section, developing economies are more sensitive to depreciation, since it would give serious damages to their non-differentiated trade sector and fragile financial system. Hence, in order to control the negative consequences of depreciations by conducting foreign exchange market interventions, some developing countries must accumulate at very high levels. Now, we will look at the reserve adequacy measures which are widely used in literature and question whether these measures correctly indicate the adequate levels of reserves in developing countries.

There are many methods in the literature used to measure and compare the levels of reserves and determine the adequate levels. The Reserve / GDP ratio has been a general method for scaling reserves (Figure 3.23). Even though this measure would give some insights about the levels of reserves in a country, this would not give a complete picture about the role of reserves in impeding the crises. Another measure which has attracted a lot of attention is the ratio of reserves to trade variables. Reserves in terms of months of imports have been frequently used to scale international reserves. According to this measure, the existing reserves should cover at least the costs of three months of import purchases. The rationale of this measure is that in case of a sudden stop in the export revenues or the external financing of developing economies, the costs of at least three months of imports should be covered by existing reserves. Figure 4.22 demonstrates the amounts of international reserves in terms of months of imports for some developing countries. Till 2000, Mexico, South Africa and Turkey accumulated below the threshold of 3 months of imports. However, after the 2000s all countries' international reserves exceeded this threshold, and the reserve levels have been much higher than the 3 months limit. The situation in other developing countries is almost similar to this case. The interpretation of this figure is that developing countries' reserves are adequate to cover the losses coming from trade shocks.

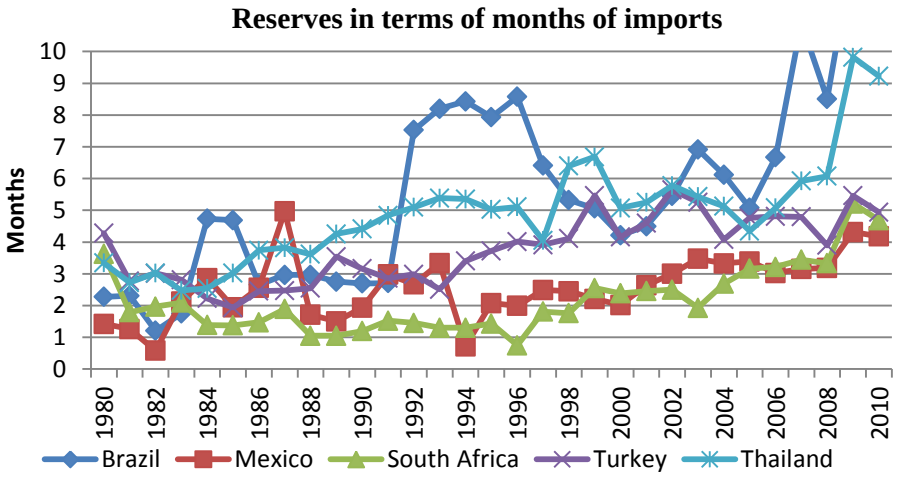


Figure 4.22: The number of the months of imports covered by foreign exchange reserves of central banks in selected developing countries over time. Source: WDI (World Bank)

However, even though this measure seems more logical in scaling reserves, some experts do not regard this as a correct indicator of the adequacy of reserves. They claim that countries insure themselves not just for the trade shocks but also capital account shocks. And more importantly, in today's world, current account shocks are not much of a deal but most severe shocks come from capital account side. Majority of the foreign currency liabilities of banks and firms is constituted by capital inflows entering into a country for speculative purposes, and not by the trade objectives. Hence, another measure of reserves which consider financial account shocks such as capital flights or sudden stops might be a better indicator.

One possible measure is proposed by the policymakers Alan Greenspan and Pablo Guidotti, named as Greenspan-Guidotti-Fisher rule (Greenspan, 1999). They simply suggested a rule whereby emerging markets should have sufficient reserves to cover their short-term external debt which has maturity up to one year, without access to foreign credit (Obstfeld, Shambaugh & Taylor, 2008). In other words, their rule states that the ratio of reserves to short-term external debt, which has maturity up to one year, should be one. The reserves should cover short-term foreign currency debt, in order not to get into trouble when a sudden-stop happens in short-term foreign capital inflows. Since this measure takes into account of sudden capital inflow reversals, which are the most crucial disturbances to balance of payments in emerging markets for the recent decades. This "Reserve / Short-Term External Debt" ratio can be a better measure of the adequacy of reserves than current account measures.

However, the economics literature questioned this rule and many studies assessed whether it is the most-consistent measure of reserves. One of the arguments against this ratio is that it disregards the convertibility of domestic funds held by the residents to foreign currency. The ratio was only able to measure the liabilities to nonresidents in foreign currency. However as Obstfeld et. al.(2008) emphasizes, there is another point that many experts don't take into consideration when determining the optimal reserve ratios. The shocks to emerging economies are not only in the form of sudden stops in capital inflows. They might be in the forms of sudden capital outflows by residents. Obstfeld et. al. (2008) states that besides the external drains, internal drains have significant role in melting the reserves. Internal

drain means runs from bank deposits to the currency by the domestic residents which drains off the deposits of the banks. If this action by residents takes the form of a flight to foreign currency, the internal drains contribute to depleting central bank reserves. However, the reserve / short term ratio fails to take into account internal drains associated with capital flight by residents (Kim, 2005). Hence, scaling reserves with regard to short-term debt level may not fully cover the all risks which a developing country can face.

What happened in Argentina during the 2001-02 Peso crisis represents that reserves equal to short-term external debt may not be enough to provide cushion against a crisis. In January 2001, total foreign exchange reserves of Bank of Argentina were 36.1 billion $. In just 3 months, the reserves melted by 10 billion $, and in April 2001 the reserves of the bank were equal to 26 billion $. In just three months 25 percent of the reserves of the central bank drained. The depletion of reserves had continued till the middle of 2002, when the crisis was at peak, and in August 2002, the bank was holding almost nothing; the reserves declined to 9 billion $. In eighteen months period, %80 of the reserves evaporated. Total net reserve loss in this period amounted to 26 billion $, which corresponds to %10 of the annual GDP of Argentina in 2001. Total short-term external debt of Argentina was 20 billion $ in 2001 and 14 billion $ in 2002[39]. The accumulated reserves in the beginning of 2001 were much higher than the short-term debt of Argentina. If the threshold, which is considered reserve / short term debt ratio to be one, was regarded as an adequate indicator, Argentina shouldn't have experienced a financial crisis. Argentina's reserves were well above its short-term external commitments and this should have been sufficient to alleviate the crisis. However, what happened in Argentina was the one of the worst emerging market crises, which the government and most of the private sector ended up with defaulting on their debts and the output contracted substantially.

[39] The data for external debt was received from World Development Indicators (World Bank, 2012). And international reserve data was obtained from Monetary Statistics Department (Central Bank of Argentina Republic, 2012).

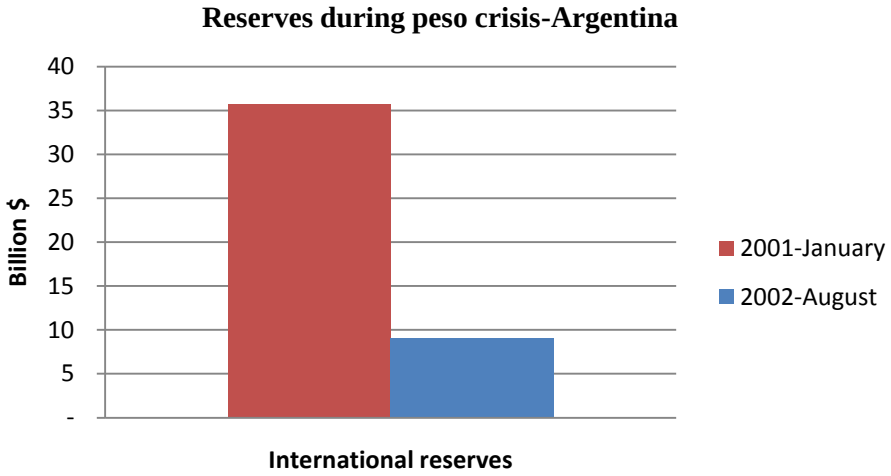


Figure 4.23: Foreign exchange reserves in January 2001 (before the crisis) and August 2002 (during crisis) in Argentina. The figure shows the excessive reserve loss of 29 billion $ in 18 months. Source: Central Bank of Argentina Republic (CBAR)

During the peso crisis, even the amount of total reserve loss of 26 billion $, as illustrated in Figure 4.23, was much higher than the short term external debt of 18 billion $ on average. Hence, drained reserves were not just used for financing the short-term debt. The loss of reserves at that time, hence, should have arisen from internal drains as well as external drains. And if we look at Figure 4.24, we could clearly observe that domestic currencies in the M2 money stock of Argentina in 2001 drained from 30 billion $ in January to 18 billion $ in November[40] (CBAR, 2012). This clearly indicates, peso holders took their money from deposit accounts, exchanged them for foreign currency and searched for safe havens to invest their money. The drain of 12 billion dollars from domestic currency deposits, led to, in the end, further drain of international reserves in CBAR (Central Bank of Argentina Republic). Hence, part of the reserve loss should be tied to flight of residents from domestic currency. The conclusion from the case of Argentina is that even though countries' reserves seem to exceed their short-term external debt, this would not be enough to say that the reserves are able to protect the country from financial crises. And reversals of the capital inflows coupled with internal drains by resident may undermine an economy, although the reserves seem to be excessive at first glance.

[40] The value of a 1 peso was fixed to 1 USD in 2001 in Argentina. Hence, peso value of M2 money stock was equal to its USD value (as documented in the text) at that time.

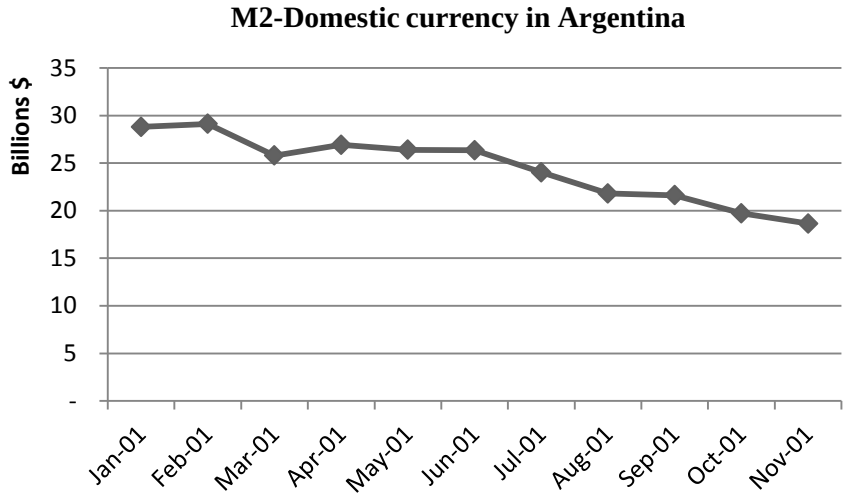


Figure 4.24: Domestic currency funds and deposits in M2 money stock in Argentina in 2001. The figure indicates a large melting in the domestic currency stock during the crisis. Source: CBAR

IMF (2011) recently proposed another measure which takes into account of all factors leading to drain of reserves. Their suggestion is summarized in the figure below.

$$\text{IMF adequacy rule} = \frac{30\%\text{Short - term debt} + 10\%PI + 5\%M2 + 5\%X}{\text{Reserves}} x100$$

PI: Portfolio inflows
Short-term debt: Foreign currency denominated debt which has maturity up to one year
M2: M2 money stock
X: total value of exports

Figure 4.25: IMF reserve adequacy rule. The rule suggests that the ratio of the variables in the nominator to the reserves should be the threshold value at which countries should accumulate. Source: IMF (2011)

According to this measure, besides financing the short-term external debt and compensating the internal drain of M2 money stock; the sudden stop of portfolio capital investments and the loss of value in the export revenues are taken into consideration. The departure of this rule from other measures is that it takes sudden foreign portfolio inflow reversals and fall in export revenues into consideration.

However, the threshold which this rule suggests may not be sufficient in a world, in which most emerging markets' financial system is internationalized. As financial markets are highly liberalized, excessive portfolio flows move into the developing economies. And in a small shock, the significant parts of these very liquid flows may disappear from developing economies in a short time. Even more than 10 percent of external portfolio funds, which is defined as the benchmark in the adequacy rule of the IMF, may evaporate a country. For example, during the recent global crisis, half of the bonds and equities stock held by non-residents evaporated from emerging markets at the peak of the turmoil (Predescu, Rodado & Torija-Zane, 2011). And this shock happened without the existence of safe havens during global crisis. As we discussed previously, the shocks to developing countries in the 1990s were much severe than the shocks during the recent global crisis, due to the presence of safe havens. And the halt in portfolio inflows was much more intensive in the crises of the 1990s than the recent global turmoil. If we assume that similar shocks hit emerging markets with the existence of safe havens, the evaporation in portfolio investments would be severe and the reserve holdings may not be able to compensate huge capital losses. Hence, as the level of foreign capital inflows increase, the risk of a reversal in these flows heightens too. And as the risks are getting higher, the need for extra reserves increases. Nevertheless, a financial shock together with the existence of safe havens may wipe out these reserves in a short time.

Another discussion for reserve adequacy is the sufficiency of reserves in the foreign exchange interventions by central banks to prevent the large fluctuations, mostly depreciations, in exchange rates. As we explained, huge appreciations or excess depreciations are very costly and politically undesirable for emerging markets. Therefore, central banks in emerging markets accumulate reserves to conduct foreign exchange operations, besides meeting external commitments in case of a trouble. And in some developing countries, whose financial systems are very sensitive to exchange rate movements, this role of reserves is very crucial. These countries frequently intervene in the market as if their currency is under fixed exchange rate band. For these economies, higher levels of reserves are needed. However, in case of a depreciation pressure on exchange rate, interventions may melt a big fraction of reserves.

For example, in August-October 2011, there was a depreciation pressure on the exchange rates of emerging markets against USD. This happened because the increasing financial fragilities in Europe and the signals of recovery in the US led global investors to perceive the USD as safe haven. Hence increasing demand for the safe haven USD caused the appreciation in the value of dollar all over the world. Many emerging markets intervene in the foreign exchange market to limit the depreciation of their currencies by selling their foreign exchange stocks in September 2011. Figure 4.26 shows that reserves in some developing countries melted down significantly just in one month. However, the depreciation was not totally taken under control.

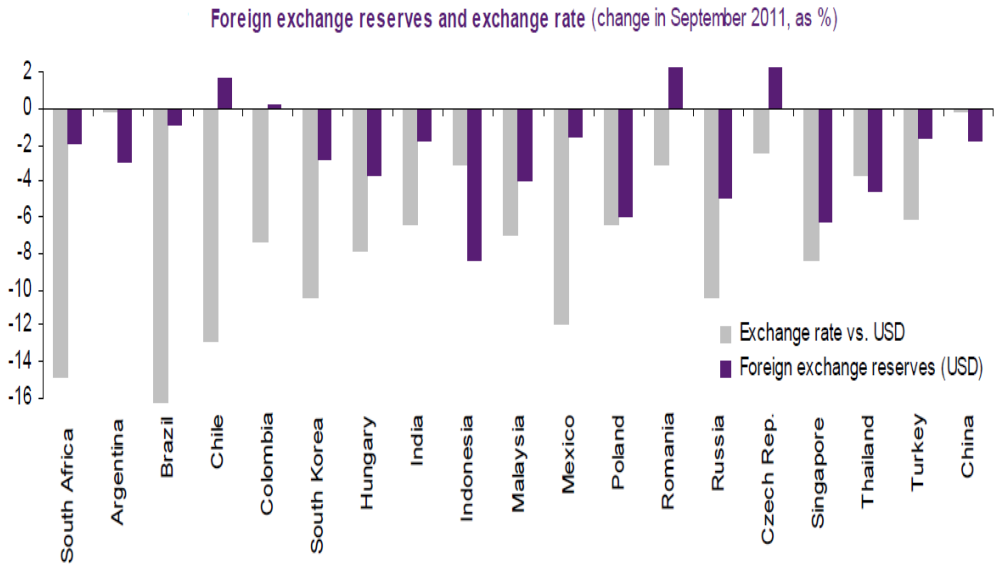


Figure 4.26: Change in the foreign exchange rate and the reserves spent to control the change in several developing countries in September 2011, when there was a global appreciation pressure in the dollar. According to the figure, most developing country currencies depreciated against USD and significant amount of their reserves was depleted in one month. Source: Predescu et. al. (2011)

Figure 4.26 indicates that in some countries almost 10 percent of the reserves are depleted as a result of the interventions in September. However, this was not adequate to control the nearly 10 percent of depreciations in these countries. If the downward pressures on exchange rates had been stronger, higher amounts of reserves might have been lost. Some economies might not have withstood this

pressure and might have faced a financial crisis. This shock was so small that, at that time the annual money market interest rate in the US was 0.1 %. Even though, the US was into the recovery process from the global financial crisis, there were still several fragilities in the financial indicators of the US. However, even under these conditions, investors perceive that USD was a safe haven. If interest rates in the US reach higher levels and financial system becomes confident in the US, dollar may gain its strong safe haven status back. Then greater shocks may hit emerging economies. And reserves may not be sufficient to cover the losses stemming from these possible larger shocks. Hence one should assert that even very large amounts of reserves can evaporate in a short time.

4.4.2 Self-Fulfilling Accumulation of Reserves

Lastly, we need to emphasize a fact that most of the literature on the adequacy of reserves do not take into consideration. This is the self-fulfilling attacks on reserves. As explained in the second chapter, the literature on the three generations of crises models highlighted the importance of self-fulfilling attacks to domestic currencies under fixed exchange rate regimes. However, with the rise of flexible exchange rate regimes in developing economies, the issue of self-fulfilling attacks on reserves has not been sufficiently addressed by economists.

Foreign exchange reserves have their own dynamics, both in terms of encouraging inflows when the stocks of reserves are high and encouraging outflows when stocks are low (Williams, 2005). In other words, the amounts of reserves may itself invite speculative attacks when the amount is low and may itself lead to further accumulation when the reserve levels are very high.

In recent years, the amounts of international reserves held by central banks have been seen as an indicator of the financial soundness of an economy. For many, higher levels of reserves held by a country mean that the country has a stronger and safer economy. A stronger economy attracts higher capital inflows to the country[41] (via increase in credit ratings or decline in the risk premiums). And lastly higher

[41] Many developing economy policy makers are proud of their excessive foreign exchange reserves, which they believe are the indications of the sound economic performance in their countries.

capital inflows mean liquidity expansions and further reserve accumulation again. In short, increasing reserves eventually lead to further accumulation of reserves. We call this phenomenon as the self-fulfilling accumulation of reserves.

Nevertheless, once the amounts of reserves are determined by the positive expectations of the investors, the fragility of the system increases because a negative change in expectations may lead to a self-fulfilling run from the reserves. And higher amounts of reserves may not eliminate the risk of this run. Wyplosz (2007) explains the reason for this phenomenon very well: "The massive accumulation of foreign exchange reserves is raising the threshold at which markets would trigger speculative attacks" (p.1). When reserves increase, the level after which the investors start a self-fulfilling run increases too. This can be exemplified as follows. Suppose that for a country, 30 billion $ of reserves are enough to cover all its external commitments and foreign exchange interventions. And assume that the country holds 100 $ of reserves. Investors may perceive this in a way that the country is doing well, which may attract more foreign capital causing higher level of reserve accumulation. However, after a time, suppose that a shock hits the economy and as a result, 15 billion $ reserves are depleted. This may lead investors to think that the reserves are running out and the country is getting riskier. This negative perception causes speculative attacks, fall in the credit ratings and further depletion of reserves. 85 billion $ is perfectly enough for the country, however the threshold in the minds of the investors is higher than the adequate level of 30 billion $, which is enough to cover the external liabilities of the country. As the credit rating agencies decline the rating of the country, prospects about the country worsen and this would intensify the self-fulfilling run from the currency of the country. This triggers further speculative attacks and may lead reserves to fall below 30 billion $. As a result, a small shock with the drain of 15 billion $ reserves, may undermine the whole reserves in a short period. In other words, self-fulfilling accumulation of reserves may easily turn into self-fulfilling depletion of reserves and may end up with financial crisis. The international reserves held by central banks could be exhausted in a very short time independent of the amount of reserves held.

In Figure 4.26, we showed that a small depreciation pressure led to a draining of nearly 10 percent of total reserves in some countries in the second half of 2011.

When safe haven currencies become stronger than now, the greater external shocks may be expected. This may bring about more than 10 percent draining. Higher loss of reserves could trigger self-fulfilling speculative attacks and further losses, even though the initial reserve levels of a country are adequate to meet the external commitments of the country. And as a result, these self-fulfilling reserve losses can lead up to a financial crisis in developing economies under flexible exchange rate regimes.

4.4.3 The Potential Risks of Excess Foreign Exchange Reserve Policies

Besides the inadequacy of reserve accumulation in providing cushion against financial shocks, the reserve accumulation strategy itself may create some other vulnerabilities for the financial system of a country. Hence, some negative implications of reserve accumulation policies could themselves play a role in the occurrence of financial crises under flexible exchange rate regimes. These vulnerabilities could be named as "burden of reserve accumulation" (Green & Togerson, 2007) and in this part of the section we will mention some of these fragilities.

When central banks accumulate foreign reserves, they inject liquidity to markets by purchasing foreign exchanges from financial markets. Excess liquidity puts downward pressure on the domestic interest rates, which in the end, may lead to domestic credit expansions (Higgins & Klitgaard, 2004). This may result in overheating and moral hazard problems in the financial system. Bank credits start expanding and upward pressure occurs on inflation rates. Figure 4.27 depicts the average foreign exchange reserves relative to the annual GDP in the 1990s and 2000s in some developing country regions. The average reserves have substantially increased in the 2000s compared to the previous decade. Figure 4.28 exhibits the shares of total private domestic credit in the GDP. The interpretation from these two figures is that as developing economies' reserve levels were increasing, these regions experienced a growth in their total credits extended by banking sector. We know that credit expansions and excess liquidity make the financial system vulnerable in a country. Hence excess reserves and recurring interventions may be a source for other

financial problems and maybe a part of triggering a crisis, even though central banks take these measures against crises.[42] This scenario happens when central banks do not sterilize their foreign exchange operations.

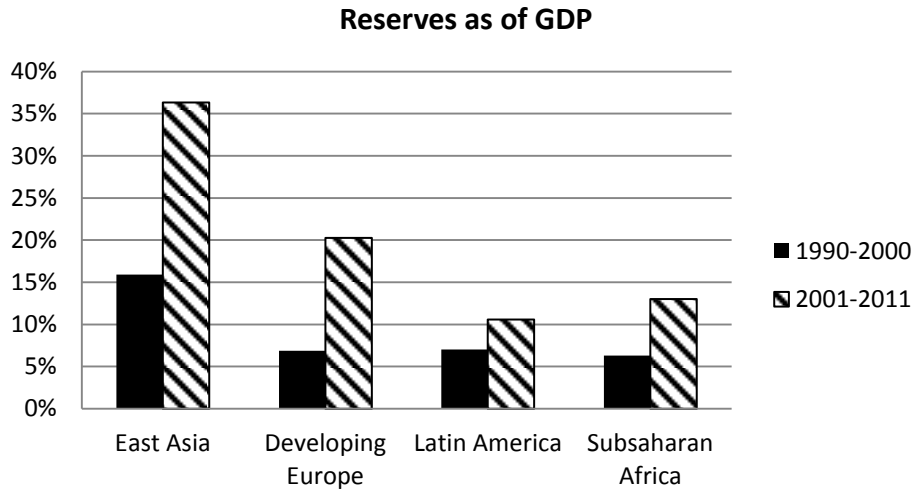


Figure 4.27: The average amount of foreign exchange reserves relative to GDP in developing country regions in two different periods. Sources: WDI and WEO.

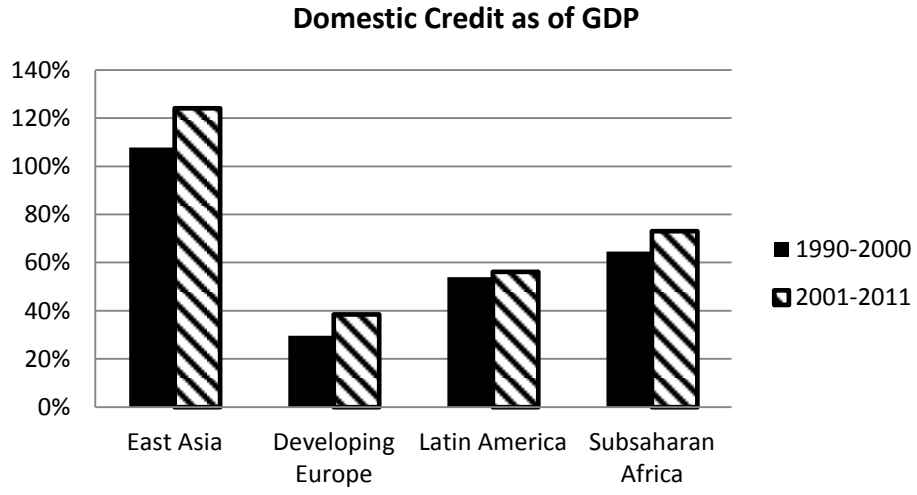


Figure 4.28: The rate of domestic credit provided by banking sector to the GDP in developing country regions in 1990-2000 and 2001-2011 respectively. Source: WDI

In situations where the financial system could not tolerate extra liquidity, the central banks could resort to sterilized reserve operations. In this sense, they want to keep the monetary base constant and do not want excess liquidity to feed inflation

[42]We will go into details of credit expansions and liquidity problems in making up of financial crises in the next section.

and domestic credits. Monetary base consists of net foreign and net domestic assets in the balance sheets of central banks. Table 4.2 indicates the balance sheet of a central bank.

Table 4.2: Balance sheet of a central bank

Assets	**Liabilities**
- **Net foreign assets** - **Net domestic assets**	- **Monetary liabilities** • Currency • Bank reserves - **Non-monetary liabilities** • Central bank securities • Others - **Equity capital**

If central banks do not sterilize their operations, they inject monetary liabilities in exchange for purchased foreign assets. This would result in excess liquidity in financial markets. In order to solve this problem, central banks issue a variety of domestic assets to the private sector. Central banks may sell government securities in their portfolios or issue their own domestic currency securities such as central bank bills. They make these operations to drain the excess liquidity in financial markets caused by reserve purchases and leave the monetary base (asset side) unchanged. This kind of a sterilization policy may be helpful to clean off the pressures caused by the excess liquidity. Nevertheless, the sterilization of interventions brings about some costs as well.

Reserve purchases and sterilization operations diminish the amount of foreign currency assets and raise the domestic currency assets in the portfolios of private investors. Higgins and Klingaard (2004) argue that the impact of this shift will be to raise the relative returns on domestic securities because domestic and foreign currency assets are imperfect substitutes (They differ in their risk and liquidity

characteristics and hence in their expected returns). Furthermore, the authorities may need to offer higher returns on the domestic assets in order to encourage private investors to buy these securities. This brings about some breakdowns in central banks' balance sheets. Central banks keep low yield foreign currency assets and issue high yield domestic assets. They earn a low return from foreign reserves while paying high returns on domestic securities. When the gap between foreign and domestic interest rates widens, the deterioration in the balance sheet gets bigger. This cost is called as the fiscal cost of foreign exchange intervention and may be harmful when the frequency of intervention increases. Moreover, central banks holding huge reserves may be exposed to significant capital losses in local currency terms when the domestic currency appreciates (Mohanty & Turner, 2006). This would be a substantial problem for the countries targeting appreciated exchange rate for the purpose of curbing inflation. As they keep the currencies appreciated by intervening in foreign exchange markets, their reserve holdings lose value in domestic currency terms. Hence appreciation may also weaken the balance sheet of central banks.

These negative impacts of reserves on balance sheets coupled with the fiscal costs of intervention may lead the credibility of a central bank to be damaged. When the credibility is jeopardized, the central bank's ability to target price stability, to intermediate government foreign borrowing, and to act as a lender of last resort will be damaged too (Green & Torgersen, 2007). In short, the sterilized foreign exchange interventions may give birth to other financial risks, from central bank balance sheet deterioration to its loss of credibility. This may even lead up to inefficiency of central bank policy tools in preventing financial crises. Hence the reserve accumulation may not be able to play its precautionary role against crises. Table 4.3 indicates, in summary, how reserve accumulation could lead up some costs and financial weaknesses in developing economies.[43] These costs of reserve accumulation are not sufficiently documented in the literature, hence are needed to be empirically investigated. However, for the time being this is beyond the scope of our thesis[44].

[43] For detailed analysis of domestic implications and risks of foreign exchange reserves, see Mohanty and Turner (2006)

[44] The empirical analysis of this issue is left for other researchers and this responsibility belongs initially to the ones who support the reserve accumulation strategy. They need to consider these costs

Table 4.3: The Risks and Costs of Foreign Exchange Interventions

Intervention	**Financial Risks**
Unsterilized	• Intervention Costs • Excess Liquidity, Credit Expansions and Moral Hazard
Sterilized	• Intervention Costs • High domestic interest rates • Fiscal cost of intervention • Central Bank's Balance Sheet deterioration and Capital Loss • Central Bank's Loss of Credibility

Our conclusion of this section is that once a sudden stop takes place (mainly originated from external factors), the reserve levels in developing economies may not be enough to avert financial crises under flexible exchange rate regimes. Also excess reserve accumulation policy could itself be deteriorating in some ways, and may be a source of a financial crisis. And the use of flexible exchange regimes may not be a good solution to these risks. In the following section, the risks of credit expansions in developing countries and the possibility of an endogenous financial crisis sourced by credit booms under flexible exchange rate regimes will be investigated.

4.5 Endogenous Burst of Credit Booms in Developing Countries, Minsky again

What we explained so far in this chapter is the depiction of possible exogenous shocks to developing countries under flexible exchange rate regimes. If it happens that these shocks do not hit developing countries in the future, we expect that sooner or later an endogenous Minskyan crisis will take place in developing countries. As clarified in the third chapter, Minskyan analysis states that financial

of high reserves and convince us that whether the costs are significant or not to create large financial problems in developing countries under flexible exchange rate regimes.

liberalization policies bring about credit booms, excess indebtedness and domination of Ponzi financing in economies. And according to the Minskyan analysis, these fragilities endogenously result in financial crises. In this section, we claim that without the existence of exogenous shocks explained above sections, developing countries under flexible exchange rate regimes may witness financial crises which result from the endogenous burst of credit cycles.

In this section of the chapter, how booming credit debts obtained by households and private sector could endogenously lead to a banking crisis under flexible exchange rate regime will be analyzed. And we will conclude to the fact that the tools of flexible exchange rate regimes and large accumulated reserves almost have no role in preventing these crises emanating from credit expansions.

According to existing literature, there is a high correlation between domestic credit expansions and financial crises. Once domestic credit levels reach very high levels, it is believed that this would cause over-heating and fragility in the financial markets. And usually the credit booms end up with the bursts and full-fledged financial crises. In the first part, we will show how credit expansions endogenously become a source of financial fragility in an open developing country, so that we could clearly understand the root causes of financial fragilities coming from enlarging credit levels. Later on, we will question the existence of excess credit expansions under flexible exchange rate regimes. In this part, we will analyze whether flexible exchange rate regimes can provide cushion against credit booms. In the third part, the association of excessive credit growth with financial crises will be presented. In this part we will question the possibility of a financial crisis stemming from excessive credit levels under flexible exchange rate regimes.

4.5.1 The Determinants of Credit Expansions and How They Lead to Financial Fragilities

According to the literature, there are plenty of factors which lead to high credit growth in an economy. The most prevalent factors of credit expansions explained by the literature are the liberalized financial markets and open capital accounts in developing countries. The banking institutions obtaining easy liquidity (in their

liabilities account) expand more credits (asset account) in the market. The deposits accounts of residents or non-residents in financial intermediaries are part of these easy liquidities. International inter-bank loans, which are counted as other investments in the liabilities account of the balance sheets are also a significant source of liquidity in developing countries. The empirical findings of Avdjiev, McCauley and McGuire (2012) suggest that international credit flows enable domestic credit booms in emerging markets. Furthermore, as discussed in section 4.4, international reserve accumulation by central banks pumps liquidity into the markets by purchasing foreign currency and injecting domestic liquidity. As a result, excess liquidity due to foreign capital flowing into the country makes firms to obtain easy funding facilities for their investments.

Furthermore, high output growth and positive expectations about the future of an economy encourage credit expansions by banks. Sound macroeconomic conditions attract more foreign capital and domestic liquidity increases after capital inflows. Banks possessing higher liquidity become more willing to lend. In addition, raising expectations about the future of the economy make firms more willing to invest in large and costly projects and as a result, their credit debts to fund these projects increase too. Meanwhile, prosperous financial wealth of the economy leads to an increase in the households' wealth and their consumption expenditure.[45] Increases in the spending of both households and firms fuel asset prices. Higher asset prices lead to increase in the value of collaterals and hence this would raise the incentives of banks to lend additional credit. As a whole, increase in global liquidity and rising economic prospects about a country lead to boom in credit burdens of almost all agents in an economy. To summarize, the derivers of credit expansions in developing countries are mainly; financial liberalization policies, capital inflows, cheap international credits, foreign exchange reserve accumulation, rising economic growth, and soaring asset prices.

However, these factors and ensuing credit expansions endogenously bring about some risks and fragilities in domestic financial markets. As credit levels extend, the likelihood of moral hazard and fraud increases and quality of the funded

[45] This may occur via both higher income level in the economy and substantial disinflation programs and macroeconomic reforms which result in low level of inflation rate.

projects worsens because monitoring the behavior of the investors become more difficult (Gourinchas, Valdes & Landerretche, 2001). Furthermore, the implicit or explicit public guarantees to banks and firms increase the moral hazard problem because they engage in riskier financial activities (Demirguc-Kunt & Detragiache, 1998). Lastly as discussed in the Misnkyan debate, positive expectations about the future of an economy lead investors to behave with lower margins of safety and engage in Ponzi financing in order to repay their debts and interests. Hence credit expansions make an economy more fragile to shocks.

For example, when the indebtedness of firms causes a trouble in their repayments of credits, the financial health of the banks is seriously damaged. The firms may default on their debt and the banks which cannot meet their liability obligations due to unpaid credit lines may default too. Furthermore, a deflation in asset prices may evoke serious consequences. Fall in asset prices leads to decreases in the financial wealth of the households and makes them unable to meet credit obligations. Also, since some assets are held as collateral by banks, a sharp fall in the value of the collateral becomes a source of further financial problems in the banks. Similar to the Post-Keynesian arguments, all these shocks occur endogenously within the dynamics of a liberal economy. That is what exactly happened in 2008, in US real estate market, which the collapse of the asset prices caused global financial imbalance. The fall in the price of the houses led to deterioration in the balance sheets of the financial institutions, which hold these houses as collateral. Coupled with their unpaid credits, their loss of wealth due to the deflation in the collaterals resulted in many financial companies to bankrupt.

4.5.2 Credit Booms and Exchange Rate Regimes

So far, we gave an overview about the fundamentals of credit booms and how they endogenously become a source of vulnerability for financial markets in the light of Post-Keynesian explanations. This part will focus on the existence of credit booms and associated financial fragilities under the flexible exchange rate regimes.

The role of exchange rate regimes in credit boom cycles has little place in the literature. The very small number of studies investigating the role of exchange rate regime in credit expansions favors flexible exchange rates and blame fixed rates in the occurrence of credit booms (Magud, Reinhart, C.M. & Vesperoni, E.R. (2012). 2012; Mendoza & Terrones, 2008). Although they do not provide empirical support for their claim, their theoretical framework is based on that fixed rates eliminate the currency risk hence global liquidity continues to flow into the country without a high risk premium. Capital inflow surge directly translates into monetary expansion because sterilization is almost impossible under fixed exchange regimes. Every attempt to sterilize the liquidity by tight monetary policy ends up with the rise in interest rates and further increasing capital inflows (Schnbal & Hoffmann, 2008). Since exchange rate is stabilized and the interest rates are mostly balanced to the anchor country, the risk premiums on these rates are very low, global capital may continue to move into the country, leading up to excess credit growth and overheating. Furthermore, a stable exchange rate means a natural hedge against currency risks, and under fixed regimes banks feel free to hold foreign currency liabilities, which end up with credit growth in an economy. Bakker and Gulde (2010) assert that global liquidity movements under fixed regimes result in high inflation and since high inflation lowers the real interest rates, this causes credit growth. However, the majority of the literature claims that under flexible exchange rate regimes, international capital movements result in currency appreciation; and thus high inflation and the need for accumulating large reserves are eliminated under flexible regimes. Since low inflation leads to higher real interest rates, and less reserve accumulation leads to less domestic liquidity in the financial markets, according to the most literature, credit expansions are less likely to happen in flexible exchange rate regimes. Also they assert that since flexible exchange rates are volatile by nature, any downward swing in the exchange rate discourages foreign capital inflows to enter the country. Higher volatility decreases the incentive for loan flows to developing economies coming for carry-trade purposes (Avdiyev et. al., 2012). Hence capital inflows are expected to be more volatile under volatile exchange rates, credit booms are less likely to be observed under floating exchange rate regimes. In some way, they propose flexible regime as the cure against the credit booms.

We believe that the interpretations in the favor of flexible regimes are misleading in some ways. Under ample global liquidity conditions, and low interest rates in the safe havens, it is highly possible to observe constant flow of global capital to emerging markets. This capital surge creates an appreciation pressure in the exchange rates of developing economies. Appreciation in a currency implies further profit opportunities for global investors and it invites more capital inflows to the appreciating currency. As external funds increase in an economy, this eventually brings about credit expansions in the economy.

Furthermore, as we clarified in the sections above, freely floating and appreciating exchange rates are not welcome for emerging economies especially for the ones which have not a competitive export sector[46]. Most emerging economies tend to control the volatility and apply a gradual appreciation path for their exchange rate by intervening in the foreign exchange market. The countries which aim to control excess appreciation pressure accumulate foreign exchange reserves and lower the interest rates. Similar to the discussion in the previous section, the policy of foreign exchange accumulation injects liquidity to the market, and the increasing levels of liquidity raise the credit levels (Figures 4.27-28). Moreover, decline in the interest rates, result in a fall in real interest rates which lead to boom in the credit demand in an economy. Hence it may be claimed that credit expansions and booms occur under flexible regimes too.

The empirical observations also support our claim. In chapter 3, we showed in Figure 3.23 that after the 2000s, flexible exchange rate regimes are the mostly used regime among developing countries. After the 2000s, majority of emerging markets began using floating exchange rate regimes. And in Figure 3.14 it was depicted that domestic credit as a share of GDP have increased sharply in 2000s, when flexible exchange rate regimes were implemented prevalently in developing countries. For the current section, the share of domestic credit in the GDP for all

[46] Even though these economies need sustained capital inflows for growth and price stability, appreciation of the currency has serious policy challenges. Appreciation dampens the export sector and in most developing economies leads to current account deficits. Also volatile exchange rate ends up with volatility in interest rates, and a high risk premium in the interest rates. This would eventually lead to slowdown in investment and consumption, which means low growth. Most developing countries could not venture the political consequences of the eventual risks of freely allowed appreciation.

emerging markets is depicted in Figure 4.29. It is clear from the figure that domestic credit levels have boomed substantially after 2000 in emerging markets. We also noted in the section about the reserve accumulation policies above, international reserve levels have increased in developing countries in the recent decade. And in Figure 4.28, it was indicated that there was a parallel movement of domestic credits with the increase in the reserves in developing country groups. Hence it should be interpreted from all these findings that, credit booms may well be observed under flexible exchange rate regimes. And hence, the fragilities stemming from credit booms may also take place under flexible exchange rate regimes as well.

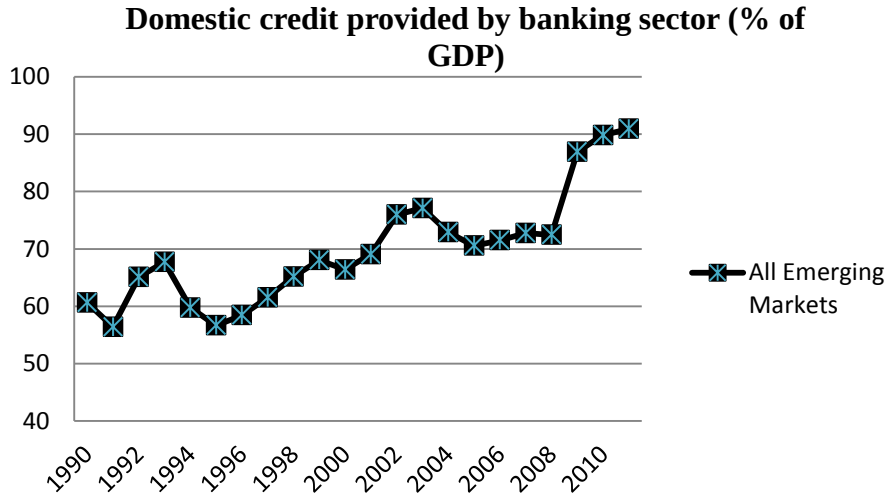


Figure 4.29: Domestic credit provided by banking sector as a share of GDP in all developing countries. Source: WDI

We have shown so far that credit booms are associated with domestic monetary fragilities and the credit booms might take place in a country irrespective of the exchange rate regime being used. There is a widespread view in the literature that if these fragilities are not monitored, credit booms may lead up to financial crises. In the following part, we will analyze the relationship between credit booms and occurrence of financial crises in developing countries. And later we will question the possibility of this kind of a crisis under flexible exchange rate regimes.

4.5.3 Credit Booms and Endogenous Banking Crises under Flexible Exchange Rate Regimes

There is an extensive literature on the possible implications of credit booms in an economy. And most of this literature asserts that there is a close linkage between credit expansions and associated banking crises. The aftermath banking crises mostly happens due to the burst in the vulnerabilities which credit booms led to. Demirguç-Kunt and Detragiache (1997), in their study on the determinants of banking crises, found out that domestic private credit as a share of GDP and real credit growth are significant inputs in the occurrence of banking crises. Mendoza and Terrones (2008) found out that most financial crises in emerging markets were associated with credit booms. Barajas, Dell'Ariccia and Levchenko (2007) stated in their detailed analysis of credit expansions:

> Credit booms are indeed associated with episodes of banking system distress… We find that larger and more prolonged booms and those coinciding with higher inflation and, to a lesser extent, low economic growth are more likely to end in crisis (p.1).

Elekdag and Wu (2011), in their work on developing country credit booms, points out that: "Episodes of excessive credit growth—credit booms—lead to growing financial imbalances, and tend to end abruptly, often in the form of financial crises." There are also other econometric studies which find evidence that credit booms increase the likelihood of banking crises (Borio & Lowe, 2002; Eichengreen and Arteta 2002; Ottens, Lambregts, & Poelhekke, 2005). The most striking result about the credit expansions appears in the work of Kaminsky and Reinhart (1999) which scanned the whole literature on the credit growth. They concluded that five out of seven studies investigating the linkage between credit booms and banking crises indicated statistically significant results and revealed a close correlation between booms and crises. Hence it seems whole literature agree on that credit growth is an important signal for banking crises. All these findings strongly support the declaration of Heterodox economists that banking crises are the endogenous result of credit and asset price booms and excess indebtedness of agents who engage in Ponzi finance (see chapter 3 for the related discussion).

The real time data on credit booms episodes does not contradict with all these findings. Figure 4.30 shows the shares of domestic private credit by the banking sector in selected developing countries covering the years when they experienced a financial crisis. Thailand, Indonesia, Philippines and Malaysia had faced over expansion in domestic credits before 1997 Asian financial crisis. At the time of the crises, domestic credit levels have reached to %160 of their GDP, which was impossible to tolerate. Similarly the second graph in Figure 4.30 indicates, during almost ten years prior to financial crisis of Argentina and Turkey in 2001, both countries' credit lines had boomed to very high levels. Also before the Tequila crisis in 1994, it is seen that credit growth was very high in Mexico.

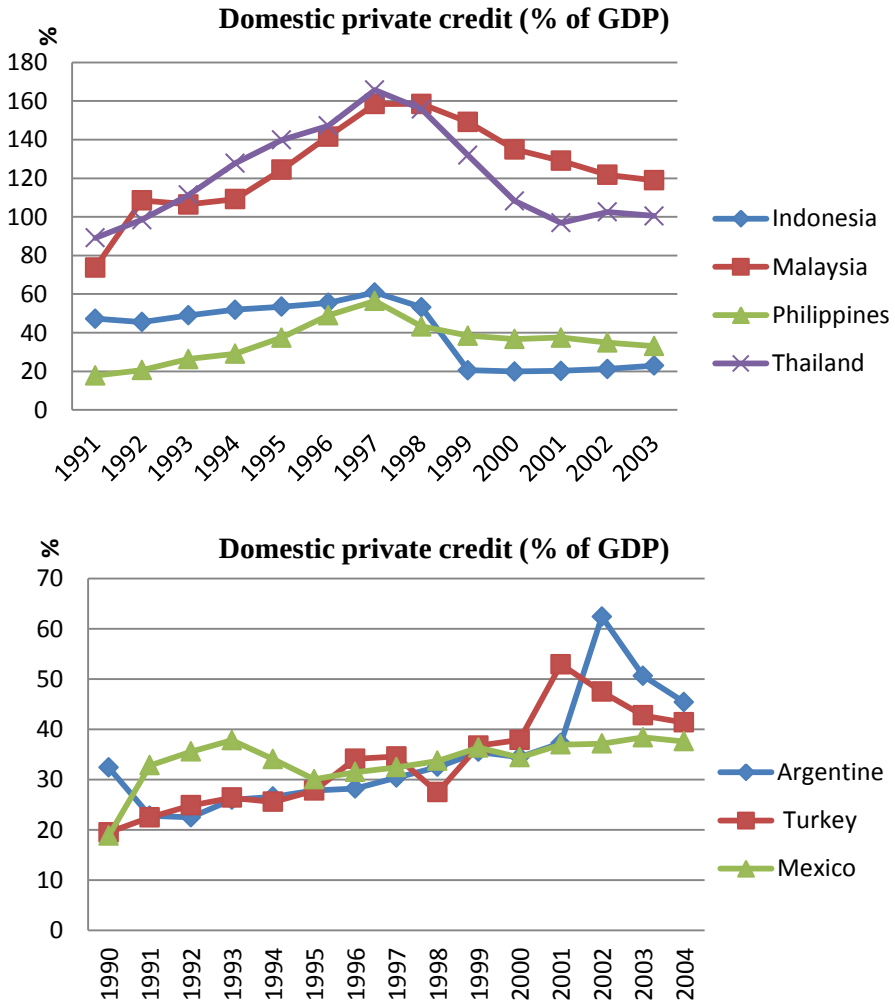


Figure 4.30: Domestic private credit provided by banking sector as of GDP in some developing economies. Source: WDI

After this point, we will explain how endogenous financial crises in credit cycles may occur under flexible exchange rate regimes. The possible conditions which may turn the excess credit growth and asset price bubbles into financial crises in developing countries under flexible exchange rate regimes will be explained.

We stated previously in this section that excess credit growths lead to financial vulnerabilities in case of defaults on loans. If the defaults take a systematic form in an economy this may result in full-fledged financial crisis, as happened in the U.S. mortgage market in the last global crisis. We also indicated that there is no significant association between credit expansions and exchange rate regimes and excess credit growths may be observable under flexible exchange rate regimes too. Hence, if the agents in the flexible exchange rate start non-performing their loan commitments, this may conclude with a financial collapse.

We depicted that private credits as a share of GDP have substantially increased in the recent decade, when most emerging markets have used flexible exchange rate regimes. Furthermore, it was demonstrated in Figure 4.21 that, increasing portion of these credits were taken by households in developing countries recently. We showed in the figure that the household credits as a share of total banking sector assets have increased significantly in some of developing economies. Since households, generally unable to hedge their risks and could not monitor their accounts professionally, the probability of defaults on household loans is always higher. Hence, increasing rate of household credits, as depicted by figure 4.21, might be a source of financial risk for developing economies under flexible exchange rate regimes.

In this section, it was mentioned that excess credit growths generally bring about asset price booms. And we stated that asset price booms are a serious risk factor for financial markets because a fall in asset prices leads to income loss for the holders of the assets. Also, the balance sheets of financial institutions which hold these assets as collateral deteriorate significantly due to this fall. Depending on the magnitude of the decline in the asset values, this would cause financial crises in economies. It was depicted in chapter 3 that asset prices have largely increased in the recent decade in developing countries (Figure 3.15). This increase is another source of financial fragility in developing economies under flexible exchange rate regimes.

We stated that one of the main reasons behind credit expansions in developing countries in recent decade is the large hoarding of external loans by the domestic banks. Foreign currency liquidity due to international loans has taken higher place in the liabilities account of domestic bank flows. Excessive reliance on foreign currency loans makes banks and firms expose to currency risks (Avdjiev et. al., 2012). Since flexible exchange rate regimes are volatile, a possible depreciation in the domestic currency leads to serious deterioration in the balance sheets of banks (Borio, McCauley & McGuire, 2011). Depreciation may give serious harm to the financial wealth of the banks and lead them to call for the domestic credits in order to meet their liabilities because the value of their international loan commitments soars. Also a halt in the international flows may give similar damages to financial markets. This halt may be caused by the external factors and end up with collapse of the internal financial markets because a stop in these flows leads to illiquidity in domestic economy.

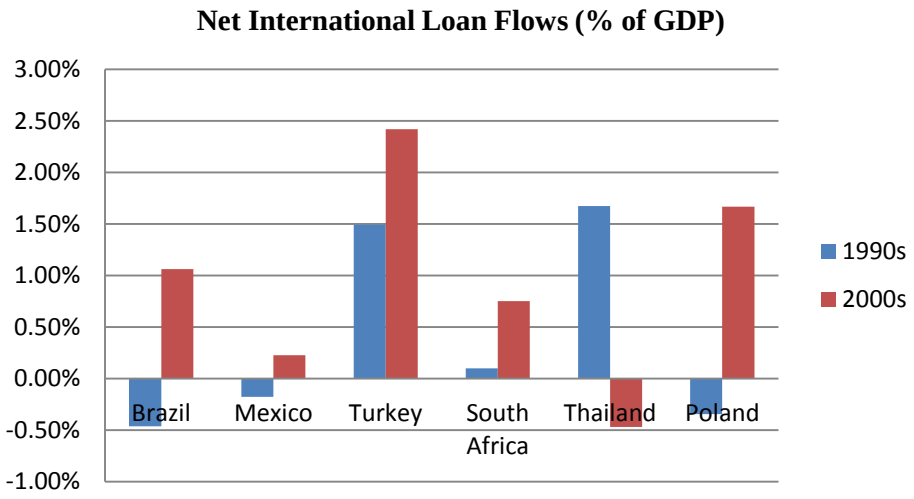


Figure 4.31: Net international loan and trade credit flows in some developing countries. Sources: CEIC and IFS

In Figure 4.31, the shares of net international loan and credit flows to some developing economies in their GDP are exhibited. Except Thailand, all emerging markets in the figure have attracted higher international loan and credit flows in the 2000s than the 1990s. There is no doubt that these increasing volumes of loan flows caused credit expansion in the domestic economies of these countries. Nevertheless,

rising presence of international loans in developing countries constitutes a risk factor for these economies. A depreciation in the exchange rate leads the value of these foreign loan commitments of banks to soar. Since flexible exchange regime is by definition volatile and a possible depreciation is not predicted prior to its occurrence, a large depreciation may undermine the balance sheets of financial institutions. Depending on the extent of depreciation, this may lead to financial crises under flexible exchange rate regimes. Moreover, a sudden stop in international loan flows, may lead to illiquidity in financial sectors. Illiquidity may lead to rise in interest rates. Increasing interest costs heighten the probability of nonperforming on domestic loans by the debtors, particularly households or small private companies. If the magnitude of the shock is large enough; this may cause a full-fledged financial crisis in developing countries in a short time. This kind of a financial crisis might happen in developing countries irrespective of the exchange rate regime they used.

All in all, developing countries with flexible exchange rate regimes may experience a financial crisis emanating from the endogenous burst of domestic and international credit expansions. The magnitude of the crisis depends on the rate of the non-performing loans, the extent of currency depreciation and the magnitude of the international loan inflows in the countries.

4.6 Does Current Account Position Matter?

Up to now in this chapter, we have tried to investigate the actual reasons behind the relative calmness of developing countries in the 2000s and to show the possible exogenous shocks and endogenous conditions which may lead to financial crises in the future in developing economies. In chapter three, we indicated that majority of the literature ties the relative stability of developing economies in the 2000s to high reserves, implementation of flexible exchange rate regimes and current account surpluses or manageable deficits in developing countries in these years. And throughout the current chapter, we demonstrated that two of these factors, international reserves and flexible exchange rate regimes, do not have such a critical role in preventing financial shocks in developing economies. And even under these policy settings, we may observe financial crises in developing economies.

Nevertheless, as mentioned in the third chapter, there is another factor which is believed by many to protect developing countries from significant financial shocks; current account surpluses or moderate deficits obtained by these countries in recent years. The majority of developing countries had positive current account balances or small deficits in the 2000s except Central and Eastern European countries (Figure 3.21). This situation has been a new phenomenon because in the 1980s and 90s, current accounts were in deficit in the most of developing economies and many of the crises of those years were, to some extent, linked to current account deficits in these economies (Catao & Milesi-Ferretti, 2011). The rationale is that deficits require constant inflows of external capital in order to finance net trade purchases and a halt in these flows lead to a collapse in the financing requirements and financial crises. However, as we pointed out developing countries have held manageable current account positions in the recent decade and for many, this helps developing countries curb financial shocks. In this section, we will question this argument and analyze whether developing countries are still vulnerable to financial shocks even though they have, by majority, sound current account positions.

Initially, it would be better to mention the literature about the relationship between current account situation and financial crises. Even though the majority of the literature asserts that current account deficits are important factors for financial crises, there are also other studies which give less weight to current account deficits in predicting financial crises (Frankel & Rose, 1996; Frankel & Saravelos, 2010; Gourinchas & Obstfeld, 2012;). Their main claim is that there are cases in which even large deficits did not result in financial crises in the past, and moreover, there are even cases in which several past financial crises were not preceded by deficits (Obstfeld, 2012). For them, there are much more significant factors than current account deficits in the occurrence of financial crises. And hence even surplus economies may experience financial collapses if other factors take place.

In this chapter, we discussed these factors in detail and they are mainly classified as the exogenous and endogenous factors. Among exogenous factors, excessive capital inflows and sudden stops in these flows are the triggering shocks and mismatched balance sheets together with liability dollarization are the transmitting factors. The discussion of current account situation is important

particularly in the debate on shocks triggering financial crises, which are sudden stops. A country with current account deficit has much dependence on external capital flows and a sudden stop in these flows lead to abrupt and painful adjustments in relative prices, balance sheet situation and resource allocation in the economy (Calvo & Reinhart, 2000). If the deficit country loses its external funding required to fill the current account gap, this generally ends up with financial shocks and crises. Nevertheless, this does not imply that sudden stops in a developing country with current account surplus will not lead to financial crises. A sudden stop in a surplus country requires adjustment in rate of returns in order to keep the external funds in the country and encourage domestic saving. Large increases in the interest rates bring about illiquidity and bankruptcies through the maturity mismatch problems of companies. Furthermore, depending on the magnitude of the sudden stop, this may result in large depreciations which may trigger bankruptcies and defaults in firms with large dollarized liabilities.

A country holds external liabilities mainly through two reasons; net import purchases and external funds coming for carry-trade opportunities which have mainly short-term maturity (look at the Minskyan discussion of chapter 2 for detailed analysis and see figure 2.1). For a developing country with current account deficit, both factors may take significant place and a sudden stop in external capital may lead to trouble in meeting the external liabilities stemming from current account deficits and financial flows for profit opportunities. For a country with current account surpluses, a sudden stop brings about a risk of meeting the external liabilities emanating from financial flows. However, in both cases total aggregated external liability position matters and components of external liabilities do not matter much. Therefore for a country with trade surplus may experience significant contraction after a sudden stop due to the inability of meeting its external commitments as well.

For example, in the 2000s, external liabilities of many developing economies were mainly constituted by financial account transactions. The capital inflows did not have the role of financing current account deficits anymore. Nevertheless, external liabilities of developing countries did not decrease and even increase due to the excessive amounts of portfolio and other capital inflows in these years. Money coming for the aim of obtaining higher yield is a liability and similarly external loans

by domestic companies are another liability. These liability commitments should be met by inflow of further international capital. And a sudden stop in these inflows would lead to significant problems in meeting external commitments and requires substantial adjustments in exchange rate and interest rates. As we explained many times in this thesis, the reversals lead to large depreciations under flexible exchange rate regimes and this may bring about bankruptcies due to excessively dollarized liabilities and similarly a sharp rise in interest rates could lead up to catastrophic consequences.

Nevertheless, the magnitude of impacts of sudden stops may differ between deficit and surplus economies. We believe that a developing country with current account deficits may be influenced harder because it depends on international capital more strictly and a halt in inflows lead to painful adjustments not in financial sector but in trade sector as well. A surplus economy may also be hit significantly by sudden stops however the magnitude of the damage may be less severe because this time only financial side will be affected and the country needn't make adjustments in trade sector. For example, in the global financial crisis almost all developing countries were impacted by the crisis; however, the countries with deficit experienced larger contractions in GDP than the countries with current account surpluses (see the discussion in chapter 3). Furthermore, Obstfeld (2012, p. 31) states that "The surplus country's lower vulnerability to disappearing gross foreign inflows also makes it much less likely that those inflows do disappear." Since deficit economies seem more vulnerable to small shocks in capital accounts, this increases the probability of experiencing speculative attack in these economies. Investors become more risk averse towards these economies and in times of rising risks, investors withdraw their funds from the deficit economies as earlier as possible. And similarly due to the low vulnerability of surplus economies to capital reversals, the probability of speculative attack relatively decreases in these economies. However, this should not mean that surplus economies will not experience significant capital account reversals.

Besides all these exogenous shocks under the case of current account surplus, endogenous fragilities of financial systems, which were explained in the previous section, may take place under surplus economies too. Capital inflows lead to excess

liquidity in financial markets irrespective of whether current account is balanced or imbalanced. Even under current account surpluses, excess liquidity lead to excessive credit expansions and asset price booms. And according to Post-Keynesian interpretation, these booms occur endogenously. As we mentioned many times in this thesis, asset price bubbles and credit booms are significant sources of financial fragility and an endogenous burst of these booms end up with financial crises. And, furthermore, shifts in portfolio or other flows can have large effects on credit lines and asset prices in an economy, even in the absence of current account imbalances (Johnson, 2009; Obstfeld, 2012; Shin, 2012). A halt in capital inflows leads to contraction in liquidity and a sharp fall in asset prices, which, in the end, gives birth to financial crises irrespective of the current account situation of the economy.

The main interpretation from this section is that financial shocks may hit developing economies with sound current account positions. In the recent years, the trade channel is not the main source of fragility, but the excessive international financial flows lead to significant fragilities. And regardless of whether the economy has current account surplus or deficits, these fragilities may turn into financial crises. However, the magnitude of the impacts of fragilities and ensuing crises may be harder and more severe in deficit countries than surplus countries because the shocks under deficit economies require more adjustments in both real sector and financial markets. Overall conclusion should be that all the mechanisms and possible conditions of prosperous financial crises under flexible exchange rate regimes, which are explained throughout this chapter, may come true irrespective of the current account situation which a developing country possess. However, the influences of crises may be milder in surplus countries.

4.7 Conclusion

In this chapter, which is the main part of the thesis, we tried to find answers to the question; is it possible for a developing country to experience a financial crisis under a flexible exchange rate regime? In answering this question, wide ranges of financial crisis dynamics were investigated in this chapter.

Initially, the roles of capital inflows and sudden stops in these flows in the occurrence of financial crises were elaborated on. We demonstrated that sudden reversals in capital inflows in developing economies are mainly dependent on the external conditions. These external conditions were summarized as the interest rates in advanced countries, the presence of safe haven currencies and macroeconomic fluctuations in the industrial world. We stated that if strong safe havens exist together with the higher levels of returns in these havens, developing economies under flexible exchange rate regimes may experience serious financial account shocks similar to the ones in the 1990s. And these shocks may lead to financial crises under flexible exchange rate regimes too. Nevertheless, due to the low levels of interest rates in advanced countries in the 2000s and the loss of safe haven status of these countries after the recent global financial crisis, we did not observe a catastrophic shock in developing countries in the 2000s.

Secondly, it was argued that the financial dollarization in the balance sheets of firms and banks in developing countries may constitute a risk factor under flexible exchange rate regimes. Due to the volatility of flexible exchange rates, the foreign exchange position of developing countries may weaken in case of a small shock because a depreciation pressure may lead residents to hold more foreign currency deposits. Similarly an appreciation pressure is a source of risk for developing countries because it generally ends up with current account deficits. Further we noted that hedging against financial dollarization and the volatility of flexible exchange rate cannot eliminate all the risks in developing countries. Even developing countries having sound balance sheet positions may face a financial crisis under flexible exchange rate regime.

Thirdly, we showed that developing countries have been accumulating extensive amounts of international reserves to alleviate the risks explained above. Nevertheless, as we pointed out, this policy is not a panacea for developing countries. Reserves may not be adequate when a large shock, in the forms of sudden stops or capital outflows by residents, hits a developing country. Additionally, reserve accumulation is a very costly strategy and has some other risks, which may turn into financial crises under flexible exchange rate regimes.

Lastly, we discussed if the exogenous shocks do not take place in developing economies, there is another factor which may trigger an endogenous financial crisis under flexible exchange rate regimes. This is excessive domestic credit expansions. Excess credit growth fuels asset price bubbles and debt burdens of households and private companies. And as a result, credit booms lead to over-heating in financial markets. In cases of the defaults on credits or sharp falls in asset prices, developing countries using flexible exchange rate regimes may experience financial turmoil, as happened in the U.S sub-prime mortgage market.

Consequently, after analyzing all these crisis dynamics, we claim that, contrary to the traditional belief, flexible exchange rate regimes and high accumulated international reserves do not solve all the problems of developing countries. Furthermore, even current account surplus countries may experience significant financial crises emanating from both exogenous and endogenous factors. The vulnerabilities that still exist in developing economies under flexible exchange rate regimes and current account surpluses may lead to financial crises, if the above dynamics come true in the future.

CHAPTER 5

CONCLUSION

After the disastrous experiences of developing countries in their financial systems in the 1980s and 1990s, developing countries seemed relatively calm and stable since 2002. Even though the global financial crisis had severe impacts on the developing world, the magnitudes of these impacts were not as large as the ones in the crises of the 1990s. As indicated in chapter 2 and chapter 3, economists and policymakers principally blamed fixed exchange rate regimes for the catastrophic experiences of the 1990s. And they attribute the relatively stable period of developing economies in the 2000s to the prevalent use of flexible exchange rate regimes together with large international reserves in these countries. They claim that flexible exchange rate regimes and large hording of international reserves provide cushion against financial crises.

Our aim in this study, throughout the above chapters, was to show that this argument of the economists and policymakers is misleading in some ways. And, we showed that financial crises may happen in developing countries even if they use flexible exchange rate regimes and accumulate large amounts of international reserves.

In the first chapter, we analyzed the existing theories of financial crises in detail. The fundamentals of developing country financial crises took place in the 1980s and 90s were discussed. By doing this, the three generations of crises models were given the priority. The discrepancies and similarities of these generation models among each other were presented to the reader. And despite the several discrepancies, we mentioned that there is one common ground in these models that took our attention most for this study: All three generations of crises models declare that the crises in developing countries occurred under the use of fixed exchange rate

regimes. According to the theories, fixed exchange rate regimes invite speculative attacks to currencies. Since developing countries did not hold sufficient amount of foreign exchange reserves, these attacks led to the collapse of fixed exchange rate regimes and severe financial crises ensued in the aftermaths of these attacks. For this reason, several experts, central bankers and even government authorities recommended flexible exchange rate regimes and accumulation of large amounts of reserves to developing countries as a treatment for financial shocks.

In the third chapter, we demonstrated that the most of developing countries acted upon these recommendations in the 2000s. The majority of the developing world began using flexible exchange rate[47] regimes and accumulated international reserves at record levels in this recent period. And as discussed in the third chapter, developing economies experienced financially stable period in the 2000s. In the years between 2002 and 2007, no significant crisis was observed in emerging markets. 2008 global financial crisis hit developing economies, however; the crisis was not felt as severely as the past crises episodes of the 1990s. In chapter three, we tied these relatively stable years in developing countries to a couple of factors. The first one is that returns in advanced countries were at historically low levels. Even though the returns declined in developing countries in these years too, developing countries were better destinations for investors to obtain profits. These very low interest rates in the industrial world decreased the probability of sudden stops in developing countries because investors did not have a better choice if they took their money from developing countries. Hence, global capital flowed to developing countries in 2002-07 without experiencing much volatility. Second factor is the loss of safe haven roles of the industrial world in these years, particularly after the global financial crisis. This enabled developing countries not to experience serious capital account reversals as observed many times in the past. In almost all the crises of the 1980s and 1990s, safe havens existed and the crisis-hit countries experienced disastrous capital reversals. Nevertheless, since the traditional safe havens faced downswings in their economies during the global financial crisis, international capital did not run away from developing countries extensively. Of course, there was

[47] By flexible exchange rate regimes, we meant the de facto free floating regimes or managed floating regimes, which are classified by the IMF (2006) in its *de facto* classification of exchange rate arrangements.

a significant capital reversal in developing countries; however, the magnitude of this reversal was not as extensive as the past reversals of the 1980s and 90s.

As the main part of the thesis, the fourth chapter questioned the possibility of a financial crisis in developing countries with flexible exchange rate regimes. The fragilities of developing countries in the recent years were analyzed in detail, and their possible roles in a prospective financial crisis in developing countries under flexible exchange rate regimes were given particular attention in the fourth chapter. The conditions under which a flexible exchange rate regime may witness a financial crisis were also a concern of the fourth chapter. We touched so many factors in explaining these conditions in the fourth chapter, and the main findings of this chapter are summarized under a different heading in the next part.

5.1 Possible Conditions of Prospective Financial Crises under Flexible Exchange Rate Regimes

Return spreads between developing and advanced countries have widened in the 2000s mainly due to the almost zero percent yields in advanced country assets. If this spread closes up, together with a rise in industrial country yields in the future, we may witness more severe sudden stops in financially fragile developing countries. Also if the U.S. and European countries get their safe haven status back, which they have lost in the recent global financial crisis and European debt crisis, capital account reversals would become more probable in developing countries. And more importantly, if these factors come true when the domestic financial system of a developing country is very fragile, the shocks to that country may become catastrophic, which may end up with a severe financial crisis. These shocks may happen in a country irrespective of the exchange rate regime used by that country, thus a developing country implementing a flexible exchange rate regime policy may well experience a financial crisis in the future.

Dollarization has long been regarded as the serious risk of fixed exchange rate regimes because stable exchange rates discourage firms and banks to take measures against the mismatches in their balance sheets. And the literature argues that since flexible exchange rates are more volatile, companies hedge their foreign

exchange exposures due to the fear of an unpredicted depreciation; thus dollarization is not a serious problem for flexible exchange rate regimes. We discussed that this argument has some shortcomings. Even if it seems that dollarization indicators have been sound in recent years in developing countries, this does not mean that these indicators will not deteriorate in the future. Due to the very complex and internationalized financial systems, balance sheets are more fragile and even a small shock may dampen the foreign exchange positions of balance sheets. Also through the volatility phenomenon of flexible exchange rates, predicting these shocks is almost impossible. For example, a small depreciation pressure in the currencies of many emerging markets in the second half of 2011, led deposit dollarization in these countries to increase in a very short time. No-one knows when depreciation takes place in flexible exchange rate regimes. For instance, a safe haven impact or higher interest rates in developed countries, may lead to capital reversals in developing countries and result in depreciation in the exchange rate. Or political instability or rising risk in domestic economies may lead to similar capital flights and ensuing depreciation. This deprecation pressure under flexible exchange rates can easily reflect on the dollarization indicators. Due to the very easy convertibility of domestic currency funds into dollars in today's financial system, residents may dollarize their holdings in a couple of days or even hours by using internet or phoning the banks. So foreign currency positions of balance sheets are very vulnerable now and a small shock may simply increase the foreign exchange exposures of balance sheets under flexible exchange rate regimes. The depreciation in exchange rates also increases the real value of existent dollarized liabilities of developing countries and may end up with bank failures and bankruptcies. And depending on the magnitude of shocks, these shocks may turn into financial crises under flexible exchange rate regimes.

Besides depreciation, large exchange rate appreciation is also a significant risk factor for some developing countries. Nominal exchange rate appreciation, which mainly occurs due to large capital inflows, leads to real currency appreciation under flexible exchange rate regimes. Real appreciations are often associated with current account deficits, particularly in the countries whose export sector consists of low-tech primary goods. Current account deficits constitute a serious risk factor for a developing economy because the deficits require constant capital inflows for

financing the imports. This makes financial system very fragile in the economy. A sudden stop in these inflows, which may happen due to the plenty of reasons, may dampen the trade channel of the economy and end up with a financial crisis. For this reason, large appreciations in flexible exchange rates may be a possible pre-condition of a prospective financial crisis in developing countries.

We showed that dollarization and volatility of flexible exchange rates are significant risks and may play a significant role in prospective financial crises in developing countries. Nevertheless, a counter-argument states that these risks can be eliminated by hedging and holding stable balance sheets. We believe that given the complexity of financial systems today, hedging does not eliminate all the risks in a country. Even if it provides some cushion for some firms which hedged their accounts, overall risks of a country cannot be hedged at the same time. The exposures of firms which applied hedging are transferred to the other companies, particularly hedge fund companies. Systemic collapse of hedge fund companies in the U.S. during the global financial crisis perfectly indicates that even hedge funds are risky. Furthermore, given the complexity of financial systems with the close interaction between the agents, even sound balance sheets may deteriorate quickly. A bank may perfectly keep its accounts accurate and stable, however; it cannot have a full control over its customers. If the customers default on their commitments, this deteriorates the balance sheet of the bank in a short time, which seemed sound previously. For example, credit defaults by households or draining of deposit accounts by investors bring about a sharp deterioration in the balance sheets of banks. Before the U.S sub-prime mortgage collapse, the balance sheets of financial institutions in the US seemed sound, but the shocks by the mortgage holders dampened whole financial system in a couple of months. Therefore, hedging and accurately matched balance sheets might not provide a protection against financial crises in developing countries under flexible exchange rate regimes. This is because financial systems are so complex today that an unpredictable shock may lead to unwanted outcomes in the financial systems of developing countries in a very short time. And these outcomes may well be observed in the countries with flexible exchange rate regimes.

Furthermore, we showed in the 2nd and 3rd chapters that high accumulated international reserves are believed by many to provide precaution against financial crises in developing countries. And according to many measures, reserves in developing countries seem adequate in recent years. However, we claim that given these highly mobilized capital flows in developing countries, even excessive amounts of reserves may not be sufficient. Since the financial accounts have been perfectly liberalized in developing countries, there is always the possibility of reversals in the external capital flows by nonresidents and also capital outflows by the residents to foreign assets. As the financial controls are getting looser, the magnitude of these shocks may be larger. And in some extreme cases, no amounts of international reserves may be enough to compensate the loss of these shocks. Later, we noted that high amounts of reserves have their own dynamics, which can be explained as follows. Higher amounts of reserves are indication of financial soundness; this invites further capital inflows to countries and further reserve accumulation, which we name "self-fulfilling accumulation of reserves". However, similarly lower reserves are indication of financial fragility; this leads to capital inflow retrenchments and further decline in the reserves, which we name "self-fulfilling depletion of reserves". Even if a country accumulates extensive amounts of reserves, a small decline in these reserves may be perceived as a risk factor for investors. Investors having this perception begin drawing their funds out of the country and this leads to further depletion of reserves. As reserves are depleted more, expectation of future risks increases and further capital inflow reversals or outflows may occur. And depending of the magnitude of the reversals, this may drain all the reserves of a country. Hence, even a country with the largest amounts of reserves is under the danger of depletion of their reserves with self-fulfilling speculative attacks. All in all, we assert that the high reserve accumulation policies may not provide a permanent protection for developing countries with flexible exchange rate regimes and these countries can face a financial crisis in the future.

What we have shown so far are the possible exogenous shocks which may result in financial crises in developing countries under flexible exchange rate regimes with large reserves. We believe that even though these exogenous shocks are not observed, an endogenous burst of credit cycle in developing countries may lead to a

financial crisis in these economies (Minskyan moment). And this may come true via the large domestic credit expansions in developing countries in the recent decade. Credit booms are mainly a result of increasing growth and loosening financial regulations in a country. Also recent experiences indicate that, credit booms can take place under flexible exchange rate regimes and they occur in developing countries irrespective of the exchange rate regime implemented. This may lead to increasing consumption levels and over-investment in economies. However, this may bring about some fragilities as well. High credit growth fuels asset price booms, brings about excessive private sector and household indebtedness, and makes banks' exposure to risks increase. In case of a shock, such as drops in asset prices, systemic defaults on the loans by households or a halt in international interbank loans, these credit boom cycles may turn into bust. For example, recent global financial crisis emerged unexpectedly from these busts in the U.S credit market. We observe that similar fragilities are taking higher place in developing countries using flexible exchange rate regimes recently. And if governments and central banks in developing countries continue believing that their reserves and exchange rate regimes secure themselves from similar credit market failures and not taking measures to smooth down the credit booms, they may experience similar financial collapses in the future.

Lastly we checked whether these exogenous and endogenous financial shocks are possible in countries under sound current account positions. The empirical findings indicate that current account deficits are mainly associated with financial crises. This was the case when external funds had the role of deficit financing in developing countries. Nevertheless, in recent years, external capital flows had the role of financing liabilities emanating from mainly short-term carry trade flows. In this case, a halt in external funds may lead to financial crises as well. Therefore, we concluded that all these exogenous and endogenous conditions we explained above may result in financial crises even in countries with current account surpluses. However, we showed in chapter 4 that the impact of a possible crisis may be more severe in deficit countries than the surplus countries.

5.2 Recommendations for Further Research

Throughout this study, we tried to build a hypothesis and explain its structure theoretically. In other words, we built a theoretical framework on the conditions of financial crises under flexible exchange rate regimes. However, we did not apply this framework to any developing country and investigate the probability of a financial crisis in a developing economy under flexible exchange rate regimes with high reserves. Application of our hypothesis to a developing country having some fragilities in recent years may be an influential research topic. For instance, the financial crisis probability in East European countries or Turkey, which have very open as well as fragile financial systems in recent years, may be investigated in the light of the hypotheses we produced during this study.

Besides this, in the thesis, there are some topics which we analyzed little but we did not fully go into details of. These topics may also be investigated in detail in the future. We enlist some of them as follows.

We mentioned in the fourth chapter that hedging may not eliminate all the risks of an economy. This issue needs empirical investigation because the literature did not focus on the efficiency of hedging tools under different exchange rate regimes so far. The detailed studies on hedging should focus on the roles of future contracts, options, currency swaps and similar hedging tools in decreasing the currency risks and their effectiveness under flexible exchange rate regimes.

We stated in the text that volatile exchange rates may end up with volatile interest rates. However, the literature did not give sufficient attention to this matter as well. How volatility of flexible exchange rate regimes affects rates and its ensuing monetary policy implications would be an interesting research topic. Furthermore, in further studies, the impacts of volatility in both exchange and interest rates on an economy may be investigated analytically and empirically.

During the discussion on the effects of foreign interest rates on capital inflows in developing countries, we calculated the stock market return differentials between some developing economies and the US in order to understand the high capital inflow surges in the 2000s. We applied this methodology to limited numbers of countries by only using the stock exchange returns. In further works, differentials

in other portfolio returns or interest rates may be used and this may be applied to wide ranges of developing countries.

Lastly, in the fourth chapter, we discussed some negative points and risks of excess foreign exchange reserve policies in developing countries. These risks have not been well documented and generally ignored in the literature so far. The risks of high reserves require more detailed analysis. In further studies, this issue may be discussed by giving particular attention to fiscal costs of reserves and their impacts on the credibility of central banks.

5.3 Policy proposals

If all these conditions we presented above occur individually or in conjunction with each other in developing countries, the future may witness several financial crises in developing countries, which may be similar to the distressful experiences of the 1980s and 1990s. For the time being, central bankers and government of developing countries seem enjoying the relative stability obtained in their financial systems in the recent decade. They seem proud of their excess reserves, flexible exchange rate regimes and high liquidity in their financial markets. They do not give an important attention to the existing fragilities in their financial systems. If they continue not considering the risks and fragilities, which we tried to manifest throughout this thesis; the possible conditions of prospective financial crises explained above may come true in the future.

For this reason, developing countries need more prudential policies today more than the past. Because, financial markets are perfectly liberalized and capital to movements between developing countries and the rest of the world have been at record levels of the history. This requires much more regulatory measures than confidence. They should not trust so much their accumulated reserves and flexible exchange rate regimes because as we showed they have limited roles in preventing financial turmoils.

What they need to do is they should encourage and boost their domestic savings in order to limit their dependence on foreign capital inflows. Also they should closely monitor the size of their financial markets. Extensive size financial

markets which are constituted by risky and leveraged derivatives lead to bubbles and fragilities in the financial system. This invites speculative attacks and brings about burst of the bubbles. For this reason, even though it seems that financial markets support growth by channeling the funds to the real side of economy; large and risky financial markets should be avoided by developing country policymakers. They might limit the extensive use of financial assets by imposing taxes on their returns or prohibiting leverage operations. Furthermore, cross-border capital inflows should be closely monitored because they domestically lead to excess liquidity and over-heating. For this reason, external capitals which have larger contribution to domestic investment formation, such as foreign direct investments or equity flows, should be encouraged. Nevertheless, the capitals coming for mainly carry trade purposes, which have generally short-term maturity, such as banking flows or private portfolio flows, should be discouraged by imposing taxes on them or setting an upper limit for the amounts of flows.

REFERENCES

Avdjiev, S., McCauley, R. N. & McGuire, P. (2012). Rapid Credit Growth and International Credit: Challenges for Asia. *BIS Working Paper No. 377.*

Agosin, M. R., & Huaita, F. (2011). Capital flows to emerging economies: Minsky in the tropics. *Cambridge Journal of Economics, 35*(4), 663-683.

Aizenman, J. & Marion, N. (2003). The high demand for international reserves in the Far East: What is going on? *Journal of the Japanese and International Economies,* Elsevier, 17(3), 370-400.

Aizenman, J., & Hutchison, M. (2011). Exchange market pressure and absorption by international reserves: Emerging markets and fear of reserve loss during the 2008-09 crisis. *Journal of International Money and Finance.*

Aizenman, J., & Lee, J. (2007). International reserves: Precautionary versus mercantilist views, theory and evidence. *Open Economies Review, 18*(2), 191-214.

Allen, M., Rosenberg, C., Keller, C., Setser, B. & Roubini, N. (2002). *A balance sheet approach to financial crisis.* International Monetary Fund.

Arteta, C. (2005). Exchange rate regimes and financial dollarization: Does flexibility reduce currency mismatches in bank intermediation? *Topics in Macroeconomics, 5*(1)

Bakker, B., & Gulde, A. (2010). *The Credit Boom-Bust in Emerging Europe: Bad Luck Or Bad Policies?*

Bank for International Settlements (2012, August). *BIS effective exchange rate indices.* Retrieved from http://www.bis.org/statistics/eer/index.htm

Bank of Mexico (2012). *Financial System Statistics.* Retrieved from *http://www.banxico.org.mx/indexEn.html*

Barajas, A., Dell'Ariccia, G., & Levchenko, A. (2007). Credit booms: The good, the bad, and the ugly. *Unpublished: International Monetary Fund.*

Bascı, E. (December 28, 2011). Central Bank of Turkey, Ankara, Turkey. Retrieved from http://www.hurriyet.com.tr/ekonomi/

Berkmen, P., Gelos, G., Rennhack, R., & Walsh, J. P. (2011). The global financial crisis: Explaining cross-country differences in the output impact. *Journal of International Money and Finance.*

Bibow, J. (2010). Global imbalances, the US dollar, and how the crisis at the core of global finance spread to "self-insuring" emerging market economies. *Intervention, 7*(2), 325-360.

Borio, C., & Lowe, P. (2002). Asset prices, financial and monetary stability: Exploring the nexus. *BIS Working Paper no.114,*

Borio, C., McCauley, R. N. & McGuire, P. M. (2011). Global Credit and Domestic Credit Booms. *BIS Quarterly Review*

Bubula, A., & Ötker, I. (2003). *Are pegged and intermediate regimes more crisis prone?* International Monetary Fund.

Burnside, C., Eichenbaum, M., & Rebelo, S. (2001). Hedging and financial fragility in fixed exchange rate regimes. *European Economic Review, 45*(7), 1151-1193.

Burnside, C., Eichenbaum, M., & Rebelo, S. (2004). Government guarantees and self-fulfilling speculative attacks. *Journal of Economic Theory, 119*(1), 31-63.

Caballero, R. J., & Krishnamurthy, A. (2003). Excessive dollar debt: Financial development and underinsurance. *The Journal of Finance, 58*(2), 867-894.

Calvo, S. (1999). Capital flows to latin america: Is there evidence of contagion effects? *Research Working Papers, 1*(1), 1-33.

Calvo, G. A. (2002). On dollarization. *Economics of Transition, 10*(2), 393-403.

Calvo, G. A., Leiderman, L., & Reinhart, C. M. (1993). Capital inflows and real exchange rate appreciation in latin america: The role of external factors. *Staff Papers-International Monetary Fund, ,* 108-151.

Calvo, G. A., Izquierdo, A., & Mejia, L. (2004). On the empirics of sudden stops: The relevance of balance-sheet effects. *National Bureau of Economic Research Working Paper Series, No. 10520*

Calvo, G. A., & Reinhart, C. M. (2000). Fear of floating. *National Bureau of Economic Research Working Paper Series, No. 7993*

Calvo, G. A. & Reinhart, C.M. (2000). When Capital Inflows Suddenly Stop: Consequences and Policy Options. *In Peter B. Kenen and Alexander K. Swoboda, eds., Reforming the international monetary and financial system*. Washington, D.C.: International Monetary Fund

Catão, L. And Milesi-Ferretti, G.M. (2011). External Liabilities and Crises. *Manuscript, International Monetary Fund.*

CEIC Data (2012). *Global Database.* Retrieved from http://ceicdata.securities.com/cdmWeb/

Central Bank of Republic of Turkey (2012). *Money and Banking Statistics.* Retrieved from http://evds.tcmb.gov.tr

Central Bank of Argentina Republic (2012). Monetary and Financial Statistics. Retrieved from http://www.bcra.gov.ar

Chang, R., & Velasco, A. (1998). Financial fragility and the exchange rate regime. *National Bureau of Economic Research Working Paper Series,* No. 6469

Chang, R., & Velasco, A. (1999). Liquidity crises in emerging markets: Theory and policy. *National Bureau of Economic Research Working Paper Series,* No. 7272

Chang, R., & Velasco, A. (2000). Exchange-rate policy for developing countries. *The American Economic Review, 90*(2), 71-75.

Chang, R., & Velasco, A. (2001). Monetary policy in a dollarized economy where balance sheets matter. *Journal of Development Economics, 66*(2), 445-464.

Chang, R. & Velasco, A. (2001). A model of financial crises in emerging markets. *The Quarterly Journal of Economics,* 116, 489-517.

Chinn, M. D., & Ito, H. (2008). A new measure of financial openness. *Journal of Comparative Policy Analysis, 10*(3), 309-322.

Chue, T. K., & Cook, D. (2008). Sudden stops and liability dollarization: Evidence from asia's financial intermediaries. *Pacific-Basin Finance Journal, 16*(4), 436-452.

Chuhan, P., Claessens, S., & Mamingi, N. (1993). Equity and bond flows to asia and latin america. *World Bank Working Paper,* (1160)

Cifarelli, G. & Paladino, G.(2006). The International Reserves Glut: Is it for Real? *University of Florence Economics Working Paper,* No. 142.

Claessens, S., Dooley, M. P., & Warner, A. (1995). Portfolio capital flows: Hot or cold? *The World Bank Economic Review, 9*(1), 153-174.

Corsetti, G., Pesenti, P., & Roubini, N. (1999). What caused the asian currency and financial crisis? *Japan and the World Economy, 11*(3), 305-373.

Cruz, M., & Walters, B. (2008). Is the accumulation of international reserves good for development? *Cambridge Journal of Economics, 32*(5), 665-681.

Davidson, P. (2008). Is the current financial distress caused by the subprime mortgage crisis a minsky moment? or is it the result of attempting to securitize illiquid noncommercial mortgage loans? *Journal of Post Keynesian Economics, 30*(4), 669-676.

Demirgüç-Kunt, A., & Detragiache, E. (1998). The determinants of banking crises in developing and developed countries. *Staff Papers-International Monetary Fund*, , 81-109.

Devarajan, S., & Fisher, A. C. (1981). Hotelling's" economics of exhaustible resources": Fifty years later. *Journal of Economic Literature, 19*(1), 65-73.

Didier, T., Hevia, C., & Schmukler, S. L. (2011). *How resilient were emerging economies to the global crisis?* World Bank.

Domac, I., & Martinez-Peria, M. S. (2003). Banking crises and exchange rate regimes: Is there a link? *Journal of International Economics, 61*(1), 41-72.

Dornbusch, R. (2001). A primer on emerging market crises. *National Bureau of Economic Research Working Paper Series*, No. 8326

Edwards, S., & Levy Yeyati, E. (2005). Flexible exchange rates as shock absorbers. *European Economic Review, 49*(8), 2079-2105.

Edwards, S., & Savastano, M. A. (1999). Exchange rates in emerging economies: What do we know? what do we need to know? *National Bureau of Economic Research Working Paper Series*, No. 7228

Eichengreen, B. (2010). Lessons of the crisis for emerging markets. *International Economics and Economic Policy, 7*(1), 49-62.

Eichengreen, B., & Arteta, C. (2002). Banking crises in emerging markets: Presumptions and evidence. *Financial Policies in Emerging Markets*, , 47-94.

Eichengreen, B., Hausmann, R., & Panizza, U. (2003). Currency mismatches, debt intolerance and original sin: Why they are not the same and why it matters. *National Bureau of Economic Research Working Paper Series*, No.10036

Eichengreen, B., Rose, A. K., Wyplosz, C., Dumas, B., & Weber, A. (1995). Exchange market mayhem: The antecedents and aftermath of speculative attacks. *Economic Policy*, , 249-312.

Eichengreen, B. & Wyplosz, C. (1993). The unstable EMS. *Brookings Papers on Economic Activity, 1993*(1), 51-143.

Eichengreen, B., & Hausmann, R. (1999). Exchange rates and financial fragility. *National Bureau of Economic Research Working Paper Series, No. 7418*

Eichengreen, B. & Rose, A. K. (1998). Staying afloat when the wind shifts: External factors and emerging-market banking crises. *National Bureau of Economic Research Working Paper Series, No. 6370*

Elekdag, S. & Wu, Y. (2011).Rapid Credit Growth: Boon or Boom-Bust? *IMF Working Papers*, Vol. , pp. 1-42, 2011.

Erturk, K. (2004). Reflections on currency crises. *Investigación Económica,* (248), 15-39.

Erturk, K. A. (2001). Overcapacity and the east asian crisis. *Journal of Post Keynesian Economics, ,* 253-275.

Fernandez-Arias, E. (1996). The new wave of private capital inflows: Push or pull? *Journal of Development Economics, 48*(2), 389-418.

Fernandez-Arias, E., & Montiel, P. J. (1996). The surge in capital inflows to developing countries: An analytical overview. *The World Bank Economic Review, 10*(1), 51-77.

Flood, R. P., & Garber, P. M. (1984). Collapsing exchange-rate regimes: Some linear examples. *Journal of International Economics, 17*(1-2), 1-13.

Flood, R. P., Marion, N. P., & International Monetary Fund. Research Dept. (2002). *Holding international reserves in an era of high capital mobility*. Washington, D.C.: International Monetary Fund, Research Department.

Flood, R., & Marion, N. (1998). Perspectives on the recent currency crisis literature. *National Bureau of Economic Research Working Paper Series*, No.6380.

Forbes, K. J., & Warnock, F. E. (2011). Capital flow waves: Surges, stops, flight, and retrenchment. *National Bureau of Economic Research Working Paper Series, No. 17351*

Frankel, J. A. (1992). Measuring international capital mobility: A review. *The American Economic Review, 82*(2), 197-202.

Frankel, J. A., & Rose, A. K. (1996). Currency crashes in emerging markets: An empirical treatment. *Journal of International Economics, 41*(3-4), 351-366.

Frankel, J. A. & Saravelos, G. (2010). Are leading indicators of financial crises useful for assessing country vulnerability? Evidence from the 2008-09 global crisis. *National Bureau of Economic Research Working Paper Series*, No. 16047

Frenkel, R., & Rapetti, M. (2009). A developing country view of the current global crisis: What should not be forgotten and what should be done. *Cambridge Journal of Economics, 33*(4), 685-702.

Gagnon, J. (2011). *Flexible Exchange Rate Regimes for a stable World Economy.* Peterson Institute for International Economics, NW Washington, DC

Goldfajn, I., & Olivares, G. (2001). Can flexible exchange rates still work in financially open economies. *G-24 Discussion Paper Series.* New York: United Nations

Goldfajn, I., & Valdes, R. O. (1996). The aftermath of appreciations. *National Bureau of Economic Research Working Paper Series*, No. 5650

Goldstein, M. (2002). Managed floating plus. *Policy Analyses in International Economic.*, Washington DC: Institute for international economics.

Goldstein, M. (2000). *Strengthening the international financial architecture: Where do we stand?* Peterson Institute for International Economics.

Goldstein, M., & Xie, D. (2009). *The impact of the financial crisis on emerging asia.* Peterson Institute for International Economics, NW Washington, DC.

Gourinchas, P., Valdes, R., & Landerretche, O. (2001). Lending booms: Latin america and the world. *National Bureau of Economic Research Working Paper Series, No. 8249*

Gourinchas, P.O. & Obstfeld, M (2012). Stories of the Twentieth Century for the Twenty-First. *American Economic Journal: Macroeconomics*, 4, 226-265.

Green, R., & Torgeson, T.(2007). *Are high foreign exchange reserves in emerging markets a blessing or a burden?* United States Department of the Treasury Office of International Affairs.

Greenspan, Alan. (1999). Currency Reserves and Debt. *Remarks before the World Bank Conference on Recent Trends in Reserves Management*, Washington, D.C.

Habib, M. M., & Stracca, L. (2011). Getting beyond carry trade: What makes a safe haven currency? *Journal of International Economics,* 87(1), 50-64.

Hausmann, R., Panizza, U., & Stein, E. (2001). Why do countries float the way they float? *Journal of Development Economics, 66*(2), 387-414.

Higgins, M., & Klitgaard, T. (2004). Reserve accumulation: Implications for global capital flows and financial markets. *Current Issues in Economics and Finance, 10*(10), 1-8.

Honohan, P., & Shi, A. (2002). Deposit dollarization and the financial sector in emerging economies. *World Bank Policy Research Working Paper, 2748*

Hotelling, H. (1931). The economics of exhaustible resources. *The Journal of Political Economy, 39*(2), 137-175.

Husain, A. M., Mody, A., & Rogoff, K. S. (2005). Exchange rate regime durability and performance in developing versus advanced economies. *Journal of Monetary Economics, 52*(1), 35-64.

Hutchison, M. M., & Noy, I. (2006). Sudden stops and the mexican wave: Currency crises, capital flow reversals and output loss in emerging markets. *Journal of Development Economics, 79*(1), 225-248.

International Monetary Fund (2006, July 31). *De Facto Classification of Exchange Rate Regimes and Monetary Policy Framework.* Retrieved from http://www.imf.org/external

International Monetary Fund (2010). How did emerging markets cope in the crisis. *IMF Policy Paper Series*

International Monetary Fund (2011). *International Financial Statistics.* Retrieved from http://www.imf.org/external/data.htm

International Monetary Fund (2011). *World Economic Outlook Database*. Retrieved from http://www.imf.org/external/pubs/

International Monetary Fund (2011). Assessing Reserve Adequacy. *IMF Policy Paper Series.*

Jeanne, O. (2007). International reserves in emerging market countries: Too much of a good thing? *Brookings Papers on Economic Activity, 2007*(1), 1-55.

Johnson, K. H. Gross or Net International Financial Flows: Understanding the Financial Crisis. *Working Paper*. Council on Foreign Relations, Center for Geoeconomic Studies.

Kaminsky, G. L.& Reinhart, C. M. (1999). The twin crises: The causes of banking and balance-of-payments problems. *American Economic Review, ,* 473-500.

Kaminsky, G. L. (2003). Varieties of currency crises. *National Bureau of Economic Research Working Paper Series, No. 10193*

Kaminsky, G., & Schmukler, S. (2003). Short-run pain, long-run gain: The effects of financial liberalization. *National Bureau of Economic Research Working Paper Series,* No.9787

Kim, S. (2005). Monetary policy, foreign exchange policy, and delayed overshooting. *Journal of Money, Credit and Banking, ,* 775-782.

Kregel, J. A. (1998). *Yes, It did happen again - A minsky crisis happened in asia.* .EconWPA.

Kregel, J. (2004). Can we create a stable international financial environment that ensures net resource transfers to developing countries? *Journal of Post Keynesian Economics, 26*(4), 573-590.

Kregel, J. (2009). Managing the impact of volatility in international capital markets in an uncertain world. *Levy Economics Institute Working Paper no.558,*

Kregel, J. A. (2004). *External financing for development and international financial instability.* United Nations Conference on Trade and Development.

Krugman, P. (1979). A model of balance-of-payments crises. *Journal of Money, Credit and Banking, 11*(3), 311-325.

Krugman, Paul (1996), "Are Currency Crises Self-Fulfilling?," *NBER Macroeconomics Annual, February,* pp. 1-38.

Krugman, P. (1997), "Currency Crises," *Prepared for NBER conference, mimeo,* October, pp. 1-16.

Krugman, P. (1999). Balance sheets, the transfer problem, and financial crises. *International Tax and Public Finance, 6*(4), 459-472.

Krugman, P. (2000). Crises: The price of globalization? *Global Economic Integration: Opportunities and Challenges, ,* 75-105.

Krugman, Paul (2003), Crises: The Next Generation?, *in Helpman/Sadka, Economic Policy in the International Economy,* Cambridge University Press, pp. 15-31.

Levchenko, A. A., & Mauro, P. (2007). Do some forms of financial flows help protect against "Sudden stops"? *The World Bank Economic Review, 21*(3), 389-411.

Magud, N. E. (2010). Currency mismatch, openness and exchange rate regime choice. *Journal of Macroeconomics, 32*(1), 68-89.

Magud, N. E., Reinhart, C.M. & Vesperoni, E.R. (2012). Capital Inflows, Exchange Rate Flexibility, and Credit Booms. *IMF Working Paper Series*, 12(41)

Marx, K. (1894). *Capital*. Penguin Books Limited. August, 1992

McKinnon, R., & Schnabl, G. (2004). The east asian dollar standard, fear of floating, and original sin. *Review of Development Economics, 8*(3), 331-360.

McKinnon, R. I., & Pill, H. (1997). Credible economic liberalizations and overborrowing. *The American Economic Review, 87*(2), 189-193.

Meirelles, H. C. (January 19, 2009). *Ten years of floating exchange rate in Brazil*. Central Bank of Brazil, Brasilia

Mendoza, E. G., & Terrones, M. E. (2008). An anatomy of credit booms: Evidence from macro aggregates and micro data. *National Bureau of Economic Research Working Paper Series, No. 14049*

Mihaljek, D. (2008). The financial stability implications of increased capital flows for emerging market economies. *BIS Papers, 44*, 11-44.

Minsky, H. (1992). The financial instability hypothesis. *The Jerome Levy Economics Institute Working Paper no.74*,

Minsky, H. P. & Kaufman, H. (1986). *Stabilizing an unstable economy* Yale University Press, New Haven.

Mishkin, F. S. (1998). The dangers of Exchange-Rate pegging in Emerging-Market countries. *International Finance, 1*(1), 81-101.

Mishkin, F. S. (1997). Understanding financial crises: A developing country perspective. *National Bureau of Economic Research Working Paper Series*, No, 5600.

Mishkin, F. S. (2010). Over the cliff: From the subprime to the global financial crisis. *National Bureau of Economic Research Working Paper Series, No. 16609*

Mohan, R. & Kapur, M.(2009). *Liberalisation and regulation of capital flows: Lessons for emerging market economies.* Stanford University Center For International Development.

Mohanty, M. S. & Turner, P. (2006). Foreign Exchange Reserve Accumulation in Emerging Markets: What are the Domestic Implications? *BIS Quarterly Review, September 2006*.

Naudé, W. A. (2009). *The financial crisis of 2008 and the developing countries.* United Nations University, World Institute for Development Economics Research.

Obstfeld, M. (2009). International finance and growth in developing countries: What have we Learned. *IMF Staff Papers, 56*(1), 63-111.

Obstfeld, M. (1986). Rational and self-fulfilling balance-of-payments crises. *National Bureau of Economic Research Paper Series*, No. 1486.

Obstfeld, M. (1994). The logic of currency crises. *National Bureau of Economic Research Working Paper Series*, No. 4640.

Obstfeld, M., & Rogoff, K. (1995). The mirage of fixed exchange rates. *National Bureau of Economic Research Working Paper Series,* No. 5191

Obstfeld, M., Shambaugh, J. C., & Taylor, A. M. (2008). Financial stability, the trilemma, and international reserves. *National Bureau of Economic Research Working Paper Series, No. 14217*

Obstfeld, M. (2012). Does the current account still matter. *National Bureau of Economic Research Working Paper Series*, No. 17877

Ottens, D., Lambregts, E., & Poelhekke, S. (2005). *Credit booms in emerging market economies: A recipe for banking crises?* De Nederlandsche Bank.

Organization for Economic Co-operation and Development (2012). *OECD Statistics.* Retrieved from http://www.oecd.org/statistics/

Quinn, D. (1997). The correlates of change in international financial regulation. *American Political Science Review,* , 531-551.

Predescu, V., Rodado J.C., & Torija-Zane, E. (2011). Is the level of foreign exchange reserves held by emerging countries adequate if the financial crisis worsens? *Economic Research Publications, No:778.* Natixis, Paris

Ranaldo, A., & Söderlind, P. (2010). Safe haven currencies. *Review of Finance, 14*(3), 385-407.

Reinhart, C. M., & Reinhart, V. R. (1998). Some lessons for policy makers who deal with the mixed blessing of capital inflows. *Capital Flows and Financial Crises,* , 93-127.

Roche, D. (March 5, 1999). Beware of Fixed Exchange Rates and Currency Pegs. *The New York Times.* Retrieved from http://www.nytimes.com

Rogoff, K., Mody, A., Brooks, R., Oomes, N., & Husain, A. M. (2003). *Evolution and performance of exchange rate regimes.* International Monetary Fund.

Rose, A. K., & Svensson, L. E. O. (1994). European exchange rate credibility before the fall. *European Economic Review, 38*(6), 1185-1216.

Roubini, N., & Setser, B. (2004). *Bailouts or bail-ins? responding to financial crises in emerging markets*. Institute for International Economics, Washington, DC,

Salant, S. W., & Henderson, D. W. (1978). Market anticipations of government policies and the price of gold. *The Journal of Political Economy*, , 627-648.

Saxena, S. C. (2004). The changing nature of currency crises. *Journal of Economic Surveys, 18*(3), 321-350.

Schnabl, G., & Hoffmann, A. (2008). Monetary policy, vagabonding liquidity and bursting bubbles in new and emerging markets: An overinvestment view. *The World Economy, 31*(9), 1226-1252.

Shin, H.S. (2012). Global Banking Glut and Loan Risk Premium. *IMF Economic Review*, 60(2), 155-192

Stiglitz, J. E. (2000). Capital market liberalization, economic growth, and instability. *World Development, 28*(6), 1075-1086.

Taylor, M. P., & Sarno, L. (1997). Capital flows to developing countries: Long-and short-term determinants. *The World Bank Economic Review, 11*(3), 451-470.

Upper, C. (2000) How Safe Was the 'Safe Haven'? Financial Market Liquidity During the 1998 Turbulences. *Deutsche Bundesbank Working Paper No. 1/00.*

Van Wincoop, E., & Yi, K. M. (2000). Asia crisis postmortem: Where did the money go and did the united states benefit? *Federal Reserve Bank of New York Economic Policy Review, 6*(3)

Velasco, A., & Céspedes, L. F. (1999). Exchange rate arrangements: A developing country perspective. *New York University, Mimeo,*

Williams, M. V., & Monetary Centre for Monetary Studies. (2006). *Foreign exchange reserves: How much is enough?* Caribbean Centre for Monetary Studies.

World Bank (2007). *Global Development Finance: The Development Potential of Surging Capital Flows.* Washington, World Bank.

World Bank (2011). *World Development Indicators.* Retrieved from http://data.worldbank.org/data-catalog/world-development-indicators

Wolfson, M. H. (2002). Minsky's theory of financial crises in a global context. *Journal of Economic Issues, 36*(2), 393-400.

Wray, L. R. (2008). Financial markets meltdown: What can we learn from minsky. *Economics Public Policy Brief Archieve*, 94

Wray, L. R. (2011). Waiting for the next crash: The minskyan lessons we failed to learn. *Public Policy Brief,* (120)

Wyplosz, C. (2007). The foreign exchange reserves buildup: Business as usual? *World, 2500*, 3000.

Wyplosz, C. (2008). Is east asia safe from financial crises? *China, Asia, and the New World Economy*, , 233-253.

Yeyati, E. L. (2006). Financial dollarization: Evaluating the consequences. *Economic Policy, 21*(45), 61-118.

Yılmaz, D. (July 22, 2010). *The Impact of Global Crisis on World and Turkish Economy, and the Recuperation Process.* Nineteenth World Business Congress, Karatay University, Konya, Turkey. Retrieved from http:\\www.milliyet.com.tr

APPENDIX

TEZ FOTOKOPİ İZİN FORMU

ENSTİTÜ

Fen Bilimleri Enstitüsü ☐

Sosyal Bilimler Enstitüsü ■

Uygulamalı Matematik Enstitüsü ☐

Enformatik Enstitüsü ☐

Deniz Bilimleri Enstitüsü ☐

YAZARIN

Soyadı : Çolak
Adı : Mehmet Selman
Bölümü : İktisat

TEZİN ADI (İngilizce) : The Possibility of Financial Crises in Developing Countries under Flexible Exchange Rate Regimes: A Multidimensional Approach

TEZİN TÜRÜ : Yüksek Lisans ■ Doktora ☐

1. Tezimin tamamı dünya çapında erişime açılsın ve kaynak gösterilmek şartıyla tezimin bir kısmı veya tamamının fotokopisi alınsın. ■
2. Tezimin tamamı yalnızca Orta Doğu Teknik Üniversitesi kullancılarının erişimine açılsın. (Bu seçenekle tezinizin fotokopisi ya da elektronik kopyası Kütüphane aracılığı ile ODTÜ dışına dağıtılmayacaktır.) ☐
3. Tezim bir (1) yıl süreyle erişime kapalı olsun. (Bu seçenekle tezinizin fotokopisi ya da elektronik kopyası Kütüphane aracılığı ile ODTÜ dışına dağıtılmayacaktır.) ☐

Yazarın imzası ..... Tarih .....