

FINANCIAL DOLLARIZATION, MONETARY POLICY STANCE AND
INSTITUTIONAL STRUCTURE: THE EXPERIENCE OF LATIN AMERICA
AND TURKEY

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

BY

ARZU UZUN

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

NOVEMBER 2005

Approval of the Graduate School of Social Sciences

Prof. Dr. Sencer Ayata
Director

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

Prof. Dr. Haluk Erlat
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 of Economics.

Assoc. Prof. Dr. Erdal Özmen
Supervisor

Examining Committee Members

Prof. Dr. Erol Taymaz (METU,ECON) _____

Assoc. Prof. Dr. Erdal Özmen (METU,ECON) _____

Dr. Çiğdem Koğar (Central Bank of the Republic of Turkey) _____

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 : Arzu Uzun

Signature :

ABSTRACT

FINANCIAL DOLLARIZATION, MONETARY POLICY STANCE AND INSTITUTIONAL STRUCTURE: THE EXPERIENCE OF LATIN AMERICA AND TURKEY

Uzun, Arzu

M.S., Department of Economics

Supervisor: Assoc. Prof. Dr. Erdal Özmen

November 2005, 78 pages

Financial dollarization, defined as the substantial presence of foreign currency denominated assets and liabilities in the balance sheets of the main sectors of an economy, is a widespread phenomenon among developing economies, especially in Latin America and Turkey. Since financial dollarization often causes financial fragility and limits the effectiveness of monetary policy, the causes and consequences of it and dedollarization strategies have been placed at the forefront of policy debates especially in developing countries. The purpose of this study is to analyse the determinants of corporate sector asset and liability dollarization in ten Latin American countries (Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Mexico, Peru, Uruguay and Venezuela) and Turkey for the period 1990-2001. To this end, this study considers the effects of monetary policy stance (exchange rate flexibility and adoption of a *de facto* inflation targeting regime), institutional structure (governance) and macroeconomic stance variables (volatilities of inflation and real effective exchange rates) on financial dollarization. The results based on panel data estimations suggest that high and volatile inflation and depreciation of domestic currency induce a switch to dollar denominated assets and liabilities. Furthermore, exchange rate regime flexibility appears to reduce liability dollarization and encourage asset dollarization. Finally, the empirical analysis supports the hypothesis

that adoption of inflation targeting regime and strengthening the institutional structure are significant in decreasing the level of financial dollarization.

Keywords: Financial Dollarization, Firm-Level Asset and Debt Dollarization, Exchange Rate Regimes, Inflation Targeting, Latin America and Turkey.

ÖZ

FINANSAL DOLARİZASYON, PARA POLİTİKASI TUTUMU ve KURUMSAL YAPI: LATİN AMERİKA ve TÜRKİYE DENEYİMİ

Uzun, Arzu

Yüksek Lisans, İktisat Bölümü

Tez Yöneticisi: Doç. Dr. Erdal Özmen

Kasım 2005, 78 sayfa

Ekonomideki belli başlı sektörlerin bilançolarının büyük bir bölümünün yabancı para cinsinden varlık ve yükümlülüklerden meydana gelmesi olarak tanımlanan finansal dolarizasyon, gelişmekte olan ülkelerde özellikle de Latin Amerika ve Türkiye’de çok yaygın bir olgudur. Finansal kırılganlığa yol açtığı ve para politikasının etkinliğini sınırlandırdığı için finansal dolarizasyonun neden ve sonuçları ve dedolarizasyon politikaları özellikle gelişmekte olan ülkelerde politika tartışmalarının ön sıralarında yer almaktadır. Bu çalışmanın amacı, 1990-2001 dönemi itibarıyla on Latin Amerika ülkesi (Arjantin, Bolivya, Brezilya, Şili, Kolombiya, Kosta Rika, Meksika, Peru, Uruguay, Venezuela) ve Türkiye’deki şirketler kesimi varlık ve yükümlülük dolarizasyonunun belirleyicilerini araştırmaktır. Bu amaçla, çalışmada para politikası tutumunun (döviz kuru esnekliği ve enflasyon hedeflemesi), kurumsal yapının (yönetişim) ve makroekonomik göstergelerin (enflasyon oynaklığı ve reel döviz kuru değişimleri) finansal dolarizasyon üzerindeki etkisi incelenmektedir. Panel veri tahminlerine dayanan sonuçlar, yüksek ve oynak enflasyon oranlarının ve yerel paranın değer kaybetmesinin firma varlık ve yükümlülüklerinin yabancı paraya kaymasına sebep olduğunu göstermektedir. Ayrıca, döviz kuru esnekliğinin, yükümlülük dolarizasyonunu azaltırken varlık dolarizasyonu teşvik ettiği görülmektedir. Son olarak da, yapılan ampirik çalışma finansal dolarizasyonun azaltılmasında enflasyon

hedeflemesi uygulanmasının ve kurumsal yapının güçlendirilmesinin önemli olduğu yönündeki hipotezi desteklemektedir.

Anahtar Kelimeler: Finansal Dolarizasyon, Firma-Bazı Varlık ve Yükümlülük Dolarizasyonu, Döviz Kuru Rejimleri, Enflasyon Hedeflemesi, Latin America ve Türkiye.

To My Parents

ACKNOWLEDGMENTS

I would like to express the deepest appreciation to my supervisor Assoc. Prof. Dr. Erdal Özmen for his direction, guidance and support. A very sincere thanks to the members of the examining committee, Dr. Çiğdem Koğar and Prof. Dr. Erol Taymaz for their helpful suggestions and comments. Also, I thank to Aysun Öztürk and Seçil Kaya Bahçe for his help in finding data that are the hearth of my thesis.

I would also like to thank to my mother Zeynep, my father Mehmet Emin and my brother Ahmet for their continuous support and understanding. And a very special thanks to my sister İpek Ekşi and my brother Emrah Ekşi for their direction, assistance and support. Finally, words alone cannot express the thanks I owe to Mert Uluç, my husband, for his encouragement and patience.

TABLE OF CONTENTS

PLAGIARISM.....	iii
ABSTRACT.....	iv
ÖZ.....	vi
DEDICATION.....	viii
ACKNOWLEDGMENTS	ix
TABLE OF CONTENTS.....	x
LIST OF TABLES.....	xiii
LIST OF FIGURES	xiv
CHAPTER	
I. INTRODUCTION	1
II. FINANCIAL DOLLARIZATION.....	4
II.1. Definitions of Financial Dollarization.....	4
II.2. Determinants of Financial Dollarization	6
II.2.1. The Causes of Deposit Dollarization	7
II.2.1.1. Inflation and Real Exchange Rate Changes	7
II.2.1.2. Interest Rate Spread.....	9
II.2.1.3. The Portfolio Argument.....	10
II.2.1.4. The Role of Pass-Through.....	11
II.2.1.5. Time Inconsistency and Lack of Monetary Policy Credibility	11
II.2.1.6. The Market Imperfection Argument.....	12
II.2.1.6.1. Deposit Insurance.....	12
II.2.1.6.2. Lender of Last Resort	13
II.2.1.7. Hysteresis or the Ratchet Effect.....	14
II.2.2. The Causes of Credit Dollarization	15
II.2.2.1. Bank-Specific Factor: Asset and Liability Management.....	15
II.2.2.2. Firm-specific Factor: Hedging Behavior.....	16

II.2.2.3. Macroeconomic Factors.....	17
II.2.2.3.1. The Role of Central Bank Policy.....	17
II.2.2.3.2. Uncertainty and Lack of Credibility of Domestic Policy	17
II.2.2.3.3. Financial Development.....	18
II.2.2.3.4. Incomplete Markets, Warranties and Risk Miscalculation	18
II.3. Financial Dollarization and Monetary Policy Stance	19
II.3.1. Monetary Targeting	19
II.3.2. Exchange Rate Regimes	22
II.3.3. Inflation Targeting.....	26
II.4. Financial Dollarization and Institutional Structure	28
II.5. Benefits and Costs of Financial Dollarization on Financial System .	29
II.5.1. Benefits of Financial Dollarization.....	29
II.5.2. Financial Fragility.....	30
II.6. Financial Dedollarization.....	33
II.6.1. Strengthening of the Safety Net of the Financial System	34
II.6.2. Development of Domestic Currency Markets	35
II.6.3. Monetary Policy and Institutional Framework	36
III. FINANCIAL DOLLARIZATION IN LATIN AMERICA AND TURKEY.....	38
III.1. Inflation Rate and Exchange Rate Changes.....	40
III.2. Exchange Rate Regimes	42
III.3. Inflation Targeting.....	45
III.4. Institutional Determinants	45
III.5. Financial Vulnerability.....	48
III.6. De-Dollarization in Latin America	49
IV. THE ECONOMETRIC FRAMEWORK.....	51
IV.1. The Model and Data Set	51
IV.2. Empirical Results	55
V. CONCLUSION.....	63
REFERENCES	66

APPENDICES

APPENDIX A. Corporate Sector Asset and Debt Dollarization in Latin America and Turkey during 1990-2002.....	75
--	----

LIST OF TABLES

TABLES

Table III.1. Exchange Rate Regimes in Latin America and Turkey	44
Table IV.2.1. Descriptive Statistics of Variables.....	56
Table IV.2.2. Determinants of Debt Dollarization	57
Table IV.2.3. Determinants of Asset Dollarization.....	57

LIST OF FIGURES

FIGURES

Figure III.1. Corporate Sector Asset and Debt Dollarization in Latin America and Turkey, 2001	39
Figure III.2. Dollarization versus Average Inflation, Latin America and Turkey	40
Figure III.3. Dollarization versus Exchange Rate Flexibility, Latin America and Turkey	43
Figure III.4. Dollarization versus Country Risk in Latin America and Turkey, 2001	46
Figure III.5. Government Quality in Latin America and Turkey, 2002.....	47

CHAPTER I

INTRODUCTION

During the last two decades, one of the most remarkable features of globalization has been the increase in emerging economies of the domestic use of a foreign currency. This has been the case especially in Latin America and Turkey. Foreign currency has been used increasingly, alongside the local currency, in all three of the classic functions of money (means of payment, store of value, unit of account). More specifically, financial dollarization is defined as holding by residents a significant share of assets and liabilities in the form of foreign-currency-denominated instruments (Ize and Levy-Yeyati, 2003). Since the US dollar is generally the main foreign-currency of choice in many emerging markets, this phenomenon has been named as 'financial dollarization' in the literature.

Financial dollarization is a widespread phenomenon among developing economies. In those countries, high inflation and sudden depreciation of the domestic currency leads banks and their customers to shift part of their business to foreign currency-denominated deposits and loans. Dollarization occurs as a free choice by rational economic agents, reducing the potential for inflationary finance, and allowing for better portfolio diversification, which can reduce or even reverse capital flight (Havrylyshyn and Beddies, 2003). Regardless the regulators reservations, foreign-currency-denominated deposits are the alternative liquid assets that attracts to investors attention especially increasing with the globalization process.

Despite the substantial progress during the last decade in controlling inflation throughout the world, the general trend of the increasing use of foreign-currency-denominated assets and liabilities in emerging countries has continued. According to Ize and Parrado (2002), during this process

many countries have allowed dollarization to develop in order to avoid capital flight, limit financial disintermediation, and reduce the cost of public debt. However, the expanding dollarization raises a number of important theoretical and political concerns. Firstly, there is a concern that dollarization can reduce the effectiveness of monetary policy. It affects the choice of assets that should be included in the monetary aggregates and the choice of exchange rate regimes. The second concern is about the risks that dollarization poses for macroeconomic and financial stability and performance through creating currency and/or maturity balance sheet mismatches and complicating the management of a crisis by reducing the effectiveness of financial safety.

Financial dollarization is persistent in many Latin American countries and Turkey, where severe financial crises took place in the last decade. Therefore, in order to understand the dynamics of crises and more generally, macroeconomic performance, dollarization phenomenon needs to be carefully evaluated. Thus, avoiding dollarization is one of the key issues today and most importantly any successful dedollarization strategy should evaluate firstly which motivates agents to dollarize. However, there has not been much empirical study on the determinants of currency composition of economic agents' assets and liabilities. Dollarization of financial intermediation is neglected whereas dollarization of currency transactions (currency substitution) is extensively studied in the literature. However, an analysis of currency substitution is not sufficient to explain the persistence of dollarization phenomenon that took place the 1990s, de facto dollarization progressed steadily despite falling inflation and attempts to limit exchange rate movements. Besides inflation and exchange rate changes, monetary policy stance and a continued lack of confidence in underlying policy fundamentals, even if price stability is established, can be the explanations for this persistence. Thus, this draws up the purpose of this study, which aims at shedding some light on the determinants of financial dollarization.

The purpose of this study is to evaluate empirically, besides macroeconomic factors, whether monetary policy stance (exchange rate flexibility and inflation targeting regime) and institutional structure have effects on both firm-level asset and liability dollarization. The database encompasses a sample of ten Latin American countries and Turkey, where de facto dollarization has progressed steadily during 1980s and 1990s due to histories of high inflation and lack of confidence in domestic currency. Indeed, the countries in the sample have the similar financial and institutional structures. The existence of weak supervisory and regulatory institutions in 1990s and early 2000s led them experiencing financial crises.

The rest of the thesis is structured as follows. Chapter II provides a brief review of the literature on financial dollarization. This chapter is divided into six sections. In the first section, financial dollarization definitions are reviewed, then determinants of asset and liability dollarization are discussed. In the third section, the interrelations between financial dollarization and monetary policy stance (monetary, exchange rate and inflation targeting regimes) are presented. In the fourth section, the reasons why institutional structure can affect financial dollarization are clarified. In the fifth section, benefits and costs of financial dollarization on financial system are evaluated and finally dedollarization strategies are analyzed. Chapter III focuses on a number of stylized facts of Latin American and Turkish economies. This chapter provides some descriptive measures of financial dollarization, inflation history, exchange rate regime flexibility, government quality and political, economic and financial risks in Latin America and Turkey for the period 1990-2002. This chapter also presents the efforts of Latin American countries to reduce the level of dollarization. Chapter IV presents the empirical framework that analyze the determinants of firm-level asset and liability dollarization in Latin America and Turkey for the period 1990-2001 by employing panel data techniques. Finally, Chapter V summarizes all the findings and draws conclusions.

CHAPTER II

FINANCIAL DOLLARIZATION

II.1. DEFINITIONS OF FINANCIAL DOLLARIZATION

Dollarization is the process of substituting a foreign currency for a domestic currency to fulfill the essential functions of money as a medium of exchange and/or as a store of value (Feige, 2003). Full or official dollarization is the adoption of foreign currency as a legal tender. Hence, foreign currency becomes the authorized transaction medium, store of value and the unit of account. On the other hand, in the absence of such sanctions firms and individuals voluntarily use foreign currency for transaction purposes in cash or demand deposits (payments dollarization, also known in the literature as currency substitution); hold financial assets and liabilities in foreign currency (financial dollarization, also referred to as asset substitution) or they can live in an economy where local prices and wages are indexed in foreign currency (real dollarization).

Since the purpose of this study is to evaluate empirically the effects of monetary policy stance and institutional structure on financial dollarization, the scope of the dollarization definitions would focus on financial dollarization.

First of all, since in many emerging markets domestic financial intermediation is carried out in two (or more) currencies and the US dollar is generally the main foreign-currency of choice among others, this phenomenon has been named financial dollarization in the literature (Broda and Levy-Yeyati, 2003b).

Galiani, Levy-Yeyati and Schargrotsky (2003) and Levy-Yeyati (2006) point that emerging economies tend to have weak currencies that are not accepted as store of value either domestically or internationally. Thus, in the domestic case, financial dollarization is a symptom of rejection of the local currency as store of value; as a result the public prefers to save mainly in a foreign currency.

Ize and Levy-Yeyati (2003) and Nicolo, Honohon and Ize (2003, 2005) define financial dollarization as residents holding of foreign currency denominated assets and liabilities, including bank deposits and loans as well as non-bank assets such as commercial paper or sovereign debt. Similarly, Luca and Petrova (2003) state that financial dollarization occurs when a significant share of residents' domestic financial contracts are denominated in foreign currency. These definitions imply the two feature of financial dollarization that can be either domestic (namely, financial contracts between residents such as onshore deposits and loans) or external (financial contracts between residents and non-residents such as external bonded debt) (Ize and Levy-Yeyati, 2005).

Arteta (2003) defines financial dollarization as "extensive presence of dollar assets and liabilities" in the domestic banking system. Ize and Parrado (2002), on the other hand, define financial dollarization as the use of the dollar to index deposits, loans and other financial contracts.

According to Broda and Levy-Yeyati (2003b) financial dollarization can be either in the form of foreign borrowing or deposit dollarization. Correspondingly, Reinhart, Rogoff and Savastano (2003) define financially dolarized economy where individuals and firms can hold dollar-denominated bank accounts, and/or private and public sector can borrow in dollars both domestically and from abroad. In fact, the denomination of the external debt in foreign currency is named as liability dolllarization by Calvo (2002). Until late 1990s, dollarization was defined as foreign currency denominated assets but after the recent banking and currency crises the concept of

liability dollarization start to attract attention due to its effect on the vulnerability of emerging market economies to the external shocks.

More specifically, Ize and Powell (2004) identify four types of (de facto) financial dollarization:

- i. macroeconomic hedging dollarization (as a result of risk aversion and portfolio effects due to inflation and exchange rate volatility),
- ii. market imperfection dollarization (as a result of thinner or less efficient domestic currency markets or regulatory distortions that increase the cost of domestic currency intermediation),
- iii. default dollarization (in the case of risk of borrower default),
- iv. moral hazard dollarization (If depositors are protected from counterpart risk by some insurance, contracting in dollars allows banks and their borrowers to get the upside of lower funding rates in the event of no devaluation while shifting the downside risk of devaluation to the central bank or deposit insurance agency).

II.2. DETERMINANTS OF FINANCIAL DOLLARIZATION

This section briefly summarizes the economic phenomenon, which motivates agents to dollarize. De facto dollarization is typically the rational response of economic agents to the loss of confidence in the domestic currency. The key determinants of dollarization are inflation differentials, devaluation expectations, the interest rate spread and macroeconomic factors such as macroeconomic hedging stemming from investor risk aversion, time inconsistency and lack of monetary policy credibility, market imperfections, moral hazard due to deposit insurance or other guarantees in a dollarized financial system (Ize and Powell, 2004); asset and liability management, profitability, concentration and risk management of banks and firms. Also, from an institutional perspective, dollarization depends on the openness of the economy, the depth and size of the financial system, and the legal obstacles and the transaction costs associated with the acquisition of foreign currency (Havrylyshyn and Beddies, 2003). Moreover, as the scope of this study the flexibility of exchange rate,

inflation targeting framework and institutional structure may have an influence on financial dollarization.

Financial dollarization can take several forms, including credit and deposit dollarization. A better understanding of what causes financial dollarization requires distinguishing between deposit and credit dollarization.

II.2.1. The Causes of Deposit Dollarization

The degree of dollarization is endogenously determined by agents' optimizing within the constraints of policy and technology. Theory about the behavior of different classes of agents faced with the choice between home and foreign-currency denominated instruments help to clarify correlation between the degree of deposit dollarization and other macro or financial sector variables.

II.2.1.1. Inflation and Real Exchange Rate Changes

As argued Savastano (1996) and Levy-Yeyati and Arias (2003), past inflation history, high and variable inflation rates, are the driving factors in financial dollarization. As Savastano (1996) mentions "long-lasting inflationary memories in economies with a track record of monetary mismanagement" fosters financial dollarization. In addition to that, high nominal instability can lead foreign currencies to be used as unit of account in inflationary economies (Guidotti and Rodriguez, 1992).

In fact, these explanations are primarily linked to the currency substitution approach to payments dollarization. In a high inflation environment, the cost of using domestic currency increases as the confidence in domestic currency decreases and the usage of the domestic currency for transactions faces with boundaries. (Levy-Yeyati and Arias, 2003). It is a well-established fact that high inflation is positively correlated with inflation volatility. Typically, the volatile inflation decreases the appetite for investing in assets with uncertain real returns, as would be the case of deposits in domestic currency. The lack of indexed instruments in those markets coupled with

high and therefore volatile inflations contributes to financial dollarization (IABD, 2004).

In many countries, usually following episodes of high inflation and sudden depreciation, banks and their customers have spontaneously shifted part of their business to foreign currency-denominated deposits and loans (Honohan and Shi, 2003). Delgado et al. (2002) argue that uncertainty about potentially high future depreciation associated with a high real interest rate for domestic currency lending make the foreign currency lending more attractive, regardless of the risks involved. Also, domestic residents turned to foreign money as a store of value to avoid the domestic currency's rapid depreciation rate.

Large and sudden downward movements of the exchange rate lower the residents' domestic currency deposits, while increasing domestic currency borrowing. Thus, residents' asset dollarization will increase but debt dollarization will decrease since exchange rate depreciation can bring a deterioration in the value of economic agents' assets compared to its liabilities (Kamil, 2004). On the other hand, Catao and Terrones (2000) mention

As banks seek to maximize their profits in dollars, and the interest rate on domestic loans is fixed, if a devaluation occurs after the loan is disbursed its return in dollars will decline, reducing the bank's profits. So, if devaluation expectations are high, banks will tend to minimize the domestic component of their loan portfolio. By the same token, banks will try to take on more domestic deposits as devaluation expectations rise, shifting the burden of possible losses to fixed-term depositor.

However, Arteta (2002) finds empirically that the effect of current inflation and depreciation on financial dollarization is relatively poor, on the other hand, maximum inflation and depreciation have a significant effect on both deposit and credit dollarization. He concludes that countries that suffered

high inflation or experienced large depreciation in the past are more prone to have large dollarization of both credit and deposits in the present. Similarly, Honig (2005a) finds empirically that coefficients of inflation and depreciation are either insignificant or extremely small. He explains that this result can be arisen from hysteresis in the effects of past high inflation on dollarization today and/or stems from weak government fundamentals.

II.2.1.2. Interest Rate Spread

Since residents also use foreign currencies as an alternative medium of exchange, the ratio of domestic currency to foreign currency is inversely related to the ratio of their opportunity costs (Agenor and Khan, 1996).

Ize and Levy-Yeyati (2003) state that an increase in interest rate differential in favor of the domestic currency should increase the attractiveness of home currency deposits, on the other hand, the lower the attractiveness of home currency loans, thereby reducing deposit dollarization and raising loan dollarization. Similarly, Catao and Terrones (2000) argue that for low or semi-dollarized economies, dollarization tends to increase as the external interest rates fall. A decline in the external interest rate induces banks to fund their loans from abroad, and since all external borrowing is in foreign currency, banks will be also more inclined to lend in domestically US dollars relative to lending in domestic currency, as they seek to hedge against a devaluation risk. On the other hand, Licandro and Licandro (2003) mention, “interest rate ceilings, unable to compensate depositors for inflation and the lack of inflation indexed assets, forced savings out of national currency and into dollar denominated assets”.

However, the empirical findings of Arteta (2002) indicate that the explanatory performance of interest rate differentials on dollarization is poor. Sahay and Vegh (1995) and Balino et al. (1999) show that interest rate differentials help explain swings in deposit dollarization in Eastern Europe, but have much less success in explaining dollarization patterns in Latin America.

II.2.1.3. The Portfolio Argument

The portfolio approach provides explanations for the persistent levels of financial dollarization even after substantial stabilization has been achieved. According to Ize and Levy-Yeyati (1998), the decision of economic agents to hold domestic versus foreign currency assets is based on relative expected returns. However, under the assumption that interest rate parity holds, interest rate differentials offset any predictable inflation differential and equalize the expected returns in both currencies. Therefore, Ize and Levy-Yeyati (1998) state that explanations for the drivers of financial dollarization must be based on the volatility of inflation (for domestic currency assets) and real depreciation (for dollar assets) rather than levels.

As mentioned in the literature, Taylor (1985) first adopted this argument to the portfolio choices of households. According to Taylor, households would demand dollar denominated assets when the correlation of their yield with other assets is negative and the variance of their yield is low.

Then, Ize and Levy- Yeyati (1998) use a portfolio approach to explain financial dollarization in which currency choice is determined by hedging decisions on both sides of banks' balance sheets and they find that the stochastic properties of assets and liabilities are the key factors of rising dollarization. They find that financial dollarization persist and not declined, even after substantial stabilization has been achieved, if the expected volatility of inflation remains high in relation to that of the real exchange rate. In such a case, domestic residents prefer to denominate contracts in foreign currency when its purchasing power in terms of domestic consumption is stable relative to that of domestic currency. Similarly, Ize and Parrado (2002) find that financial dollarization rise in response to an increase in the volatility of domestic inflation but fall in response to an increase in the volatility of the real exchange rate.

Later, Calvo and Guidotti (1990) use the portfolio approach to explain the dollarization of public debt. They find that countries with more limited

domestic savings would tend to exhibit larger share of foreign currency-denominated external debt.

II.2.1.4. The Role of Pass-Through

According to Ize and Levy-Yeyati (1998), a rapid pass-through of the exchange rate changes into local prices will tend to stabilize real exchange rates, and then will increase dollarization. This argument is also supported by the empirical evidence of Honohan and Shi (2003) where a strong positive correlation between the degree of dollarization and speed of pass-through is found. Additionally, Reinhart, Rogoff and Savastano (2003) find that the inflationary impact of exchange rate changes is different across dollarized economies. In particular, they mention that the pass-through from exchange rate to prices is the greatest in those economies where the degree of dollarization is very high.

II.2.1.5. Time Inconsistency and Lack of Monetary Policy Credibility

The time inconsistency argument and lack of confidence in the sustainability of the monetary policy regime can also explain dollarization without resorting to portfolio effects, when combined with the possibility of debt defaults (Nicolo et al., 2003). Analysis of this issue has centered on the incentives of the government (Caballero and Krishnamurthy, 2003). Kydland and Prescott (1977) and Calvo (1978) indicates that the systematic use of monetary surprise as a means of both prompting economic activity and reducing the real burden of public debt, reduces the credibility of monetary policy, keeping these countries in the high inflation equilibrium. As inflation reduces the credibility of monetary policy, the cost of public debt issued in national currency rises sharply and decreases the agents' demand for domestic currency instruments.

The time inconsistency argument, modeled by Calvo and Guidotti (1990), is illustrated most clearly in the case of a fixed exchange rate regime with limited credibility. They argue that once foreign lenders purchase domestic-

currency-denominated debt, governments have an incentive to devalue and reduce the real value of their debt (see also Calvo (1996) and Allen and Gale (2000)). Foreign lenders rationally anticipate this and avoid purchasing domestic currency debt (Caballero and Krishnamurthy, 2003).

On the other hand, the lack of credibility of fixed exchange rate systems that did not have the fiscal fundamentals to prevent the standard type of crises described by Krugman and Obstfeld is an additional reason to hold dollar denominated assets and stay away from national currency (Licandro and Licandro, 2003).

II.2.1.6. The Market Imperfection Argument

Broda and Levy-Yeyati (2000) state that a sharp and unexpected devaluation automatically leads to the reduction of the dollar value of domestic currency-denominated assets and has an effect on the debtors' solvency of firms with dollar indexed debts and banks with foreign exchange exposure. In this context, dollar depositors or banks bailouts can be protected against exchange rate fluctuations by introducing insurance schemes. On the other hand, dollarization will be further encouraged as a result of these insurance properties. Based on this intuition, they study the links between banking safety nets and dollarization. More precisely, they analyzed two types of safety nets: a deposit insurance scheme (DIS) and bank insurance (specifically, the presence of a lender of last resort (LLR) that prevents bank defaults by bailing out banks in distress).

II.2.1.6.1. Deposit Insurance (DIS)

The Deposit Insurance Scheme, supported by the government, makes dollar-denominated deposits and loans cheaper for both banks and depositors if the insurance is unlimited and free (Licandro and Licandro, 2003). Any insurance that does not discriminate between currencies is more valuable and attractive for dollar depositors, as dollar deposits carry more risk than the domestic ones and stimulate dollarization (Broda and Levy-Yeyati, 2003a). The presence of deposit insurance may reduce depositors'

incentives to withdraw their funds in periods of banking turmoil. In addition, it may affect banks' incentives to raise their share of dollar liabilities (Arteta, 2002). Moreover, Broda and Levy-Yeyati (2003b) indicate that deposit insurance schemes, which covers foreign currency denominated deposits, increases the probability of a bank run since bank may undertake excessive risks due to standard moral hazard considerations. The extension of insurance to foreign currency bank liabilities endogenously drives up dollarization, which leaves banks more exposed to currency risk. Thus, in the absence of market discipline, deposit insurance schemes that cover foreign currency deposits increases the financial fragility.

However, Arteta (2002) finds empirically that neither credit nor deposit dollarization seems to be different under deposit insurance scheme.

II.2.1.6.2. Lender of Last Resort (LLR)

Broda and Levy-Yeyati (2000) state that in a financially dollarized economy the presence of a LLR works as an implicit insurance both to the bank and to depositors, inducing further dollarization endogenously. Further, they explain that a LLR entails a blanket bank insurance against exchange rate shocks, reduces the costs of risk-taking, leading banks to undervalue currency risk and fostering financial dollarization. This result is related to those in Burnside et al. (2001) who find that, in the presence of government guarantees, it is optimal for limited liability banks to hold as risky a portfolio as permissible to maximize the value of the guarantee. Moreover, bank insurance can be considered as a type of exchange rate commitment when Central Bank precommits to defend the price of the domestic currency. When the government intervenes in the exchange rate market to limit the exchange rate fluctuations and reduce volatility, the risks exposed by banks will decline and this will result in financial dollarization (Dooley, 2000). On the other hand, there is a vicious circle in a dollarized economy that since financial dollarization leads an increase in macroeconomic risk, the more financially dollarized the economy, the greater the incentive of the central bank to hold a substantive stock of reserves, either to defend the exchange

rate if it comes under pressure, or to bail out troubled institutions in case a devaluation cannot be avoided (Broda and Levy-Yeyati, 2003a).

Broda and Levy-Yeyati (2003b) present a simple framework for understanding the effects of financial sector safety nets on the share of deposit dollarization and they find that banks will increase their share of dollar deposits and introduce a larger currency exposure to the economy as a whole.

II.2.1.7. Hysteresis or the Ratchet Effect

While the primary cause of dollarization is considered as the instability in the financial markets, it has often been observed that high dollarization does persist and perhaps even rises after a clear achievement of improved fundamentals. This persistence phenomenon is most commonly attributed to hysteresis effect. As Oomes (2003) points out “hysteresis is not a theoretical explanation but the persistence of a previous state”. He argues that even if the macroeconomic fundamentals improve, it takes a long time for people to adjust themselves and re-establish confidence for the domestic currency. The set-up costs of establishing a dollar deposit and adjusting one's business accordingly also contribute to the hysteresis effect. Having paid the set-up costs, agents can continue to benefit from the risk-reduction that can be gained from holding a mixed portfolio of currencies (Guidotti and Rodriguez, 1992).

Empirically, this phenomenon is often captured by including a so-called ratchet variable. Havrylyshyn and Beddies (2003) indicate that the contrast between the picture of macroeconomic developments and the deposit dollarization trends confirm this hysteresis. However, Nicolo et al. (2003) find empirically no evidence of a ratchet effect.

II.2.2. The Causes of Credit Dollarization

In particular, deposit dollarization has been previously studied in the context of currency substitution, both theoretically and empirically. On the other hand, credit dollarization has started to receive attention only recently. There are currently only a few empirical studies that use data on credit dollarization to evaluate its determinants (*Arteta, 2002, Barajas and Morales, 2003 and Luca and Petrova, 2003*). These papers attempt to estimate and compare the respective contribution of firms and banks to the financial dollarization phenomenon. They try to explain why do domestic banks in these countries lend in foreign currencies, why do domestic firms borrow domestically in foreign currencies, is credit dollarization mainly supply or demand driven? In supply side, bank-specific factors such as asset and liability management, profitability, concentration, and risk management; in the demand side, firm-specific factors such as liability management, hedging behavior, profitability and risk-taking behavior are used as explanatory variables in those papers. In addition, specific indicators of overall hedging opportunities, liberalization and deregulation of the foreign exchange market and uncertainty and lack of credibility of domestic policies, as well as measures of overall financial and economic development are included.

II.2.2.1. Bank-Specific Factor: Asset and Liability Management

It is expected theoretically that banks match their foreign currency position, either because they do not want to be bare to the exchange rate risk (Calvo, 2002), or because they are required to do so (open foreign exchange position limits are compulsory), or both (Ize and Levy-Yeyati, 2003). Hence, as banks match the currency of denomination of their deposits and loans, an increase in deposit dollarization can lead to an increase credit dollarization.

Luca and Petrova (2003) find that credit dollarization in transition economies is determined by banks' optimization decisions. As banks match the currency denomination of their deposits and loans, deposit dollarization drives credit dollarization. Nicolo et al. (2003) find that foreign currency

loans are generally related to foreign currency deposits with a correlation lower than one as both regulations prevent banks from lending the total amount received and the inherent risks, attached to dollar intermediation, induce banks to limit their dollar loans and maintain large dollar liquidity buffers as net foreign assets represent a substitute for foreign currency loans to domestic firms. It can be concluded that banks in transition economies seem to do a good job at hedging against exchange rate risk by holding matched foreign exchange positions. However, as Ize and Parrado (2002) point out, as long as financial dollarization outpaces real dollarization, and this seems to be the case in transition countries, there is a currency mismatch somewhere in the economy. Banks seem to pass the exchange rate risk to firms. This decreases banks' exposure to currency risk, but it increases their exposure to default risk, and ultimately the economy's exposure to financial and currency crises (Krugman, 1999). On the other hand, Honohan and Shi (2003) indicate that placing dollar funds abroad insulates the bank more effectively against exchange rate risk, but reduces the availability of credit to local firms.

II.2.2.2. Firm-specific Factor: Hedging Behavior of Firms

There is conventional wisdom that firms tend to match the currency composition of their debt with that of costs and revenues. Therefore, they hedge against either production interruptions or currency risk. Luca and Petrova (2003) state that firms with exporting activities, and thus returns denominated in foreign currencies, are hedged against currency risk if they also borrow in foreign currency. The higher the exports are, relative to domestic production, the more dollarized the economy should be. They find empirically that a higher ratio of exports to GDP increases credit dollarization. More generally, regardless of what firms hedge against, the more integrated is the economy in the international goods market (higher trade to GDP ratio), the higher the credit dollarization. Ize and Parrado (2002) also support this positive effect of trade openness on credit dollarization. However, both Arteta (2002) and Barajas and Morales (2003) find that openness has a negative impact on dollarization. Barajas and

Morales (2003) give an explanation to this surprising result that in periods of increasing credit, nontradeable activities are the ones resorting to foreign currency borrowing more intensively.

II.2.2.3. Macroeconomic Factors

II.2.2.3.1. The Role of Central Bank Policy

Barajas and Morales (2003) argue that the central bank provides an implicit exchange rate guarantee, therefore the level of loan dollarization should be affected by the degree of central bank intervention to defend the exchange rate. They find that economic agents seem to follow policy signals regarding interest rate and exchange rate, related with to assess risk in their decisions concerning the currency denominations of loans. As a result it is found that the degree of central bank intervention to defend the exchange rate has a significant positive impact on dollarization.

II.2.2.3.2. Uncertainty and Lack of Credibility of Domestic Policy

Luca and Petrova (2003) claim that lack of credibility of monetary policy and macroeconomic uncertainty raises the dollarization levels. Jeanne (2003) argues that the uncertainty with respect to domestic monetary policy increases the cost of borrowing/lending in domestic currency and the level of borrowing/lending in dollars. Similarly, Delgado et al. (2002) states that uncertainty about potentially high future depreciation associated with a high real interest rate for domestic currency lending make the foreign currency lending more attractive, regardless of the risks involved.

Historical high values of the inflation/depreciation rate seem to lead to higher credit dollarization over time. This result presents the persistence/hysteresis effects that higher past uncertainty with respect to the price and exchange rate level has an impact in the present, if the stabilization is not credible (Ize and Parrado, 2002).

II.2.2.3.3. Financial Development

Caballero and Krishnamurthy (2003) indicate that the level of development of the financial sector has a negative effect on credit dollarization. In other words, they mention that the less developed the domestic financial market, the less the domestic economic agents value the insurance against the currency risk offered by domestic currency credit, and the more likely they are to borrow in dollars. Thus, the extent of borrowing would depend on the degree of financial development.

II.2.2.3.4. Incomplete Markets, Warranties and Risk Miscalculation

According to Caballero and Krishnamurthy (2003), credit dollarization is a problem of incomplete markets at a domestic scale. In those countries, which have financial restrictions, the national currency denominated external debt would serve as an insurance against real exchange rate shocks. However, when there is financial restrictions (incomplete markets), domestic agents tend to miscalculate the macroeconomic effect of their microeconomic decisions thereby underestimating the risk of borrowing in dollars in order to insure their own financing, thus generating a negative externality for the economy as a whole.

Hausmann and others (2001) emphasize the role of incompleteness in financial markets, associated with the "original sin" of most emerging markets. Original sin refers the inability to borrow from foreign investors in domestic currency or, in general, to borrow long term in domestic currency. At the aggregate level, they state that firms lack the possibility to fully hedge their currency exposure or alternatively to match the maturity structure of their assets and liabilities in their own currency.

Burnside, Eichenbaum and Rebelo (2001) show that the existence of warranties on the financial system, such as implicit insurance, results from governments willing to provide bailouts to domestic financial institutions in distress, thereby creating incentives for the risk-taking behavior of the

private sector, which results in excessive exchange rate positions. Also a fixed exchange rate system can serve as a warranty. The private sector internalizes the future exchange rate path thereby giving further incentives for the dollarization of credit. Burnside and others, on the other hand, state that in the absence of government insurance, it is optimal for banks to hedge exchange risk in forward markets.

II.3. FINANCIAL DOLLARIZATION AND MONETARY POLICY STANCE

The overriding goal of monetary policy is to attain and maintain a low and stable rate of inflation and to reduce the volatility of aggregate output. However, a widely held view among economists and policymakers is that dollarization restricts the scope for independent monetary policy and makes it more complex and less effective.

II.3.1. Monetary Targeting

In the late 1970s and 1980s many central banks fight against inflation by targeting monetary aggregates. The main benefits of money targets are that data on money are usually available more rapidly than others and that the nominal money supply may be more directly controllable than inflation itself. Money targets are based on the assumptions that the central bank has full control of the nominal money stock (the money multiplier and money velocity are predictable). On the other hand, money targets are particularly unsuited for countries where the inflation record and central bank credibility are fragile.

As mentioned by Levy-Yeyati (2006), the earlier literature stressed the fact that dollarization, by reducing the costs of switching to the foreign currency to avoid the effects of inflation, may increase the volatility of the demand money limiting in the capacity of the central bank to conduct monetary policy. Theory predicts that high degrees of dollarization complicates monetary policy because of less reliable intermediate targets and less effective monetary policy instruments, based on the assumption that dollarization renders money demand unstable and less predictable

(Havrylyshyn and Beddies, 2003). Berg and Borenztein (2000) claim that in dollarized economies the relevant monetary aggregates are not the traditional national currency aggregates. Since savings and transactions are performed in a foreign currency, the traditional transmission of a monetary policy would not work properly (Licandro and Licandro, 2003).

While this conventional view was rooted in currency substitution literature, Levy-Yeyati (2006) states that a similar argument could be made regarding the dollarization of domestic savings. Specifically, he mentions “as the swift to foreign-currency assets becomes less costly, the demand for reserve money should be more sensitive to monetary expansions in a dollarized economy”. Moreover his empirical analysis, testing whether financial dollarization has an impact on monetary policy, shows that financially dollarized economies display a greater sensitivity of inflation to changes in the monetary aggregates.

Also, the recent theoretical literature on liability dollarization, especially the association between liability dollarization and “fear of floating”, also has produced convenient results for monetary policy. The presence of unhedged foreign currency denominated liabilities will tend to make countries less tolerant to large exchange rate changes that may have adverse effects on sectoral balance sheets and, ultimately, on aggregate output (Reinhart et al., 2003). Cesperes, Chang and Velasco (2001a) indicate that if debts are denominated in dollars while firms earn revenue in domestic currency and do not hedge their foreign exchange exposure, sharp and unexpected devaluation can matter for financial stability since in such a case monetary policy becomes ineffective in offsetting real shocks. In an open economy, an interest-rate cut operates primarily by allowing the exchange rate to devalue in order to allow local products cheaper abroad. However, if debts are dollarized, then a nominal devaluation may drastically increase the carrying costs of the dollar debt, thus generating corporate and bank bankruptcies and potentially causing output to contract.

As Calvo and Reinhart (2002) and Hausman, Panizza and Stein (2001) point out, dollarization may limit the ability of central banks to increase interest rates to defend the currency due to fear of floating, however, this does not necessarily imply that it damages their ability to control inflation (Galindo and Leiderman, 2005). Similarly, Reinhart et al. (2003) find that the degree of dollarization had no observable effects on the period of the disinflation. They find no evidence that a high degree of dollarization makes difficult to achieve low inflation levels through monetary transmission process that dollarization does not have much influence on the volatility of base money velocity, which often used to conduct monetary policy in developing countries. Output fluctuations are similar in countries with different degrees and varieties of dollarization means that using countercyclical monetary policies are successful to reduce output fluctuations even in a highly dollarized economy. Finally, they conclude that successful disinflations generally have not been accompanied by large declines in the degree of dollarization.

In the literature, an alternative way to assess the effectiveness of monetary policy in developing countries is to measure the ability to raise revenues from seigniorage. However, Reinhart et al. (2003) find that seigniorage revenue does not differ much across the various categories of dollarized economies, this was the case especially in the late 1990s. However, reflecting the different inflation performance of the countries, seigniorage revenues are higher in highly dollarized countries.

The evidence in most countries suggest that monetary policies have been successful in bringing inflation down over the past decade, however, this sustained falls in inflation generally have not been followed by a decline in dollarization. This evidence weakens the conventional view that dollarization preclude monetary policy from attaining and maintaining its primary goal (Havrylyshyn and Beddies, 2003).

II.3.2 Exchange Rate Regimes

Financial intermediation has become heavily dollarized in several countries and been reflected in varying patterns of banks' and firms' deposits and loans, which in turn have influenced the extent of currency mismatches. Levy-Yeyati and Arias (2003) indicate that in a weak currency economy, once financial dollarization exceeds a certain threshold, currency mismatch is inevitable.

One of the debates about the causes of those mismatches relates to the exchange rate regime. There are two views concerning the links between regimes and mismatches.

The moral hazard view stresses that fixed exchange rates discourage hedging of dollar debt and encourage currency mismatches as banks and firms believe that the peg protects them from exchange rate risk (Goldstein 2002; Burnside, Eichenbaum and Rebelo 2001; Fisher, 2001; Obstfeld 1998; Mishkin 1996). Hence, a pegged exchange rate is seen as another variation of implicit guarantees. In order to maintain this regime, the monetary authority precommit to defend the price of the domestic currency and claim that the prospects of a change in the parity are nil. In these circumstances, private sector agents will have fewer incentives to hedge their foreign currency exposure (Martinez and Werner, 2001).

Indeed, Galiani et al. (2003) state that a fixed regime that successfully prevents a sharp nominal devaluation does not protect a country from the balance sheet effects of a real exchange rate (RER) adjustment in line with Fisher's (1933) classical "debt deflation" argument. Also, Ize and Levy-Yeyati (2003) indicate that price stabilization through a fixed exchange rate arrangement such as a currency board may well deepen dollarization rather than reduce it.

Therefore, the argument goes, floating exchange rates would encourage banks and firms to limit their exposure to exchange risk (Arteta, 2002). An exchange rate that fluctuates daily would have an advantage to remind banks, firms and

governments of the substantial risk of their unhedged dollar liabilities (Mishkin,1996).

On the other hand, there is a minority view that exchange rate volatility increases the cost of hedging and so floating regimes may increase currency mismatches and the amount of unhedged dollar debt (Eichengreen and Hausman 1999, McKinnon 2001). This view emphasizes that floating regimes lead to greater volatility, thereby raise the cost of insurance and result in less hedging, rather than more (Arteta, 2002).

On the other hand, there is an alternative view that because of the incompleteness of financial markets both fixed and flexible exchange rates can matter (Eichengreen and Hausmann, 1999). This view relies on the “original sin” hypothesis that due to the inability to borrow from foreign investors in domestic currency or, to borrow long term in domestic currency, banks and firms lack the possibility to fully hedge their exposures.

The overall effect of exchange rate regime on credit and deposit dollarization, and thus on currency mismatches, is an empirical question. Honig (2005,a) finds that the exchange rate regime does not affect domestic dollarization, thus dollar mismatches. This result is consistent with regulations in emerging markets that prevent domestic banks from exhibiting large currency mismatches (Calvo and Mishkin, 2003). In addition, to maintain profitability and satisfy demand for credit, domestic banks lend domestically a large share of their dollar deposits (Honohan and Shi, 2003), hence this tendency reduces currency mismatches. However, this finding contrasts with Arteta (2002) who concludes that deposit dollarization is significantly greater under floating regimes, while credit dollarization does not appear to differ significantly across regimes hence, it exacerbates currency mismatches in financial intermediation.

Monetary Target Choice for a Dollarized Economy

Most highly dollarized economies with a few exceptions have demonstrated in recent years a reasonable stabilization record. However, dollarization has been persistent and not declined due to improvements in macroeconomic fundamentals. Consequently, it can be argued that financial dollarization coincided with low inflation is not a handicap against an effective monetary policy.

On the other hand, as a monetary target, the choice of the optimal exchange rate regime has been the subject of debate among economist for a long time. More recently, the academic discussions focus on the role of dollarization on the optimal choice of long-run exchange rate systems. A more significant issue is whether dollarized countries can follow an independent monetary policy or not.

Calvo (2002) argues that dollarization not only reduces money demand but also restricts investment and production due to a radical change on the relative prices drags firms into insolvency. If the aim is to minimize the volatility of output, then there is a need of a fixed exchange rate system.

However, Chang and Velasco (2001) investigate that in the presence of balance sheet effects, countercyclical monetary policy helps to cushion the domestic effects of real external shocks under floating exchange rate regimes. Like Chang and Velasco (2001), Bernanke, Gertler and Gilchrist (1999) have pointed out that balance sheet effects are not enough to justify the fixing of the exchange rate since the trade effect of the exchange rate adjustment would overwhelm the balance sheet effect in the case of a external shock.

On the other hand, Licandro and Licandro (2003) argue that eventhough exchange rate flexibility is a need for adjusting permanent shocks, fixed exchange rate regime remains as a strongest choice for dollarized economies.

From an empirical standpoint, Céspedes, (2003) and Galindo, Panizza, and Schiantarelli (2003) find that the presence of dollar debt reduces the expansionary effect of currency depreciation. Galindo, Panizza and Schiantarelli (2003) find that depreciation is expansionary in countries with low levels of dollarization and that depreciation becomes contractionary in countries that have a substantial share of dollarization.

Unhedged foreign-currency-denominated liabilities are a major source of vulnerability for both firms and banks because large depreciations can lead to significant reductions in net worth (Mishkin 1996; Nicoló, Honohan and Ize 2003). This process can lead to sharp contractions in output and is one of the reasons why dollarized countries more prone to “fear of floating” (Calvo and Reinhart 2002). Honig (2005b) finds empirically that domestic dollarization plays a central role in producing a fear of floating among emerging market countries and developing nations. In fact, fear of floating may lead the exchange rate to stay at fixed level, making it observationally equivalent to a soft peg. In turn, fear of floating induces more liability dollarization, thereby creating a vicious circle from which it is difficult to exit (Calvo and Reinhart, 2001). Therefore, a country that is unable to reduce this risk might choose to peg even though it would otherwise prefer to float (Honig, 2005b).

According to Poirson (2001), countries tend to maintain exchange rate stability until they become financially integrated, macroeconomically stable, and have gained the ability to hedge their exchange rate risk exposure.

Levy-Yeyati (2006) state that in the event of a negative real shock, a fully floating exchange rate adjusts and thereby reduces the debtor capacity to repay. Moreover, like the capacity to pay, capital flows behave highly procyclically, demanding much higher returns in bad times. Therefore, the capital flow procyclicality amplifies the real impact of the shocks, conspiring against the possibility of conducting countercyclical (monetary and fiscal) policies and, by increasing the volatility of returns on financial assets, thus

inhibiting the deepening of long-term markets. On the other hand, the authorities' unwillingness to allow the real exchange rate to fluctuate may in turn foster financial dollarization. Since the more they target the exchange rate, the less attractive the local currency becomes, and, hence, the more dollarized the economy. Such endogeneities, rising dollarization and exchange rate rigidities force each other to provide multiple equilibria and adverse dynamics (Nicolo et al., 2003).

As shown by Ize and Parrado (2002), many financially dollarized countries continue to experience low real dollarization. Therefore, by enhancing real price and wage flexibility, the local currency can provide a better buffer against output or employment fluctuations. However, monetary policy playing an active countercyclical role seems to be inconsistent with fear of floating. Indeed, the time inconsistency and moral hazard resulting from fear of floating exacerbates financial dollarization (Nicolo et al., 2003).

As an alternative, the first best approach is a clean policy break such as a switch to a free float backed by a strong inflation anchor, through the adoption of full-fledged inflation targeting (Nicolo et al., 2003). Similarly, Céspedes, Chang and Velasco (2001b), argue that a flexible inflation targeting with a mixed use of interest rates and exchange rates could be more effective than a fixed exchange rate.

II.3.3. Inflation Targeting

The emergence of inflation targeting trace back to 1990 with public announcements of New Zealand. After 1990, inflation targeting has been gained in popularity among both industrial (8 countries) and emerging (13 countries) economies and many more are considering future adaptation of this monetary framework that is one of the operational frameworks for monetary policy aimed at attaining price stability by targeting inflation directly.

Some authors have argued that the way to achieve a permanent reduction in the degree of dollarisation is precisely to anchor expected inflation at low and stable levels. According to Ize and Levy-Yeyati (2003), a policy combination of inflation targeting (to the extent it reduces inflation volatility) and floating exchange rates (to the extent it increase real exchange rate volatility) minimizes dollarization incentives by increasing real exchange rate volatility relative to price volatility, foster the use of domestic currency and discourage the use of foreign currency. A stabilization policy that gradually reduces inflation volatility may fail to reverse dollarization if it is accompanied by an increasingly more stable real exchange rate. Latin American economies provide good examples where the decline of inflation volatility in the post-stabilization period was offset by a fall in the volatility of real exchange rate changes.

Adopting an explicit inflation-targeting framework that combines an independent monetary policy with a floating exchange rate yields a number of benefits relative to monetary and exchange rate anchors. On the other hand, inflation targeting can be costly in terms of institutional and operational requirements, making the framework unsuitable for some emerging market economies, since most of them lack of technical capabilities and central bank autonomy (Eichengreen and Hausmann, 1999). Additionally, the transition period could unnecessarily endanger financial markets in a dollarized economy. Although the floating exchange rate regime would insulate the economy from external shocks and allow for an independent monetary policy aimed at anchoring expected inflation, the balance sheet effect resulting from financial dollarization is an important challenge to the independence of monetary policy. Large and abrupt exchange rate movements may destabilize financial markets, with adverse effects on real economic activity (Velarde, 2005). Choi and Cook (2003) find empirically that a fixed exchange rate stabilizes bank balance sheets and leads to greater business cycle stability than does an inflationary targeting interest rate rule. Since, many developing economies have large negative debt position much of that is denominated in foreign currencies.

II.4. FINANCIAL DOLLARIZATION AND INSTITUTIONAL STRUCTURE

Many economist aim to investigate the relationship between institutions and economic performance since economic and political institutions appear to be the major determinant of economic outcomes. Weak institutions are unable to deal with economic crises and distortionary macroeconomic policies are not the only determinant of the economic performance, and are more likely symptoms of underlying institutional problems (Acemoglu et al., 2002).

Similarly, Rigobon and Rodrik (2004) estimate the interrelationship among economic and political institutions, trade openness, income, and geographical constraints and they find that democracy and the rule of law are good for economic performance.

Indeed, there are a number of reasons to believe that institutional structure affects financial dollarization. First of all, myopic politicians who are eager to expand short-run output might enact inflationary policy that has the long-run effect of reducing confidence in the domestic currency, thereby encouraging financial dollarization (Honig, 2005a). Next, poor regulation and supervision of the financial system, result in large losses in bank balance sheets, make it costly for the monetary authorities to raise interest rates to control inflation (Calvo and Mishkin 2003). Finally, the persistence of dollarization may come about due to the fears of a collapse of the monetary regime. In the case of a fixed peg, the preference for dollar denominated assets depends on expectations of how monetary policy would be managed in the event of a collapse (Ize and Parrado, 2002). Moreover, according to Nicolo et al. (2003), the countries with weaker institutions are more likely to engage in government bailouts. In brief, the explanation of why agents may continue to dollarize their assets and liabilities despite falling inflation rates can be a lack of faith that the government will continue these successful policies.

Although Levy-Yeyati (2006), Honig (2005a) and Nicolo et al. (2003, 2005) use different measures of institutional quality, they all demonstrate

empirically that institutional structure is the driver factor of domestic dollarization. They conclude that improvements in institutions can be effective in reducing financial dollarization.

These empirical results, improving the institutions of government can lead to a reduction in the degree of dollarization, suggests that the policy reform agenda to reverse the domestic dollarization process should also include measures to strengthen the institutional environment such as contracting include enforcement of adequate legal rights for creditors, quality of accounting, political stability, relatively undistorted goods markets and the overall quality of government (Nicolo et al., 2003, 2005).

Moreover, Honig states (2005a) that emerging markets can achieve redemption from “Original Sin” in the domestic sense by improving the institutional quality. As Calvo and Mishkin (2003) mention “it’s the institutions stupid”, no particular exchange rate regime can accomplish this.

II.5. BENEFITS AND COSTS OF FINANCIAL DOLLARIZATION ON FINANCIAL SYSTEM

II.5.1. Benefits of Financial Dollarization

In fact, in the literature the potential benefits of financial dollarization are usually neglected. Arteta (2003) states four important potential benefits of financial dollarization as follows:

- The presence of dollar deposits and loans in countries that suffered high macroeconomic instability in the past has enhanced financial intermediation and helped avoid demonetization. If dollar accounts were not allowed in those countries, depositors would not be as willing to hold their savings in the resident banking sector. If banks did not have the option of lending in dollars, their supply of credit would likely be lower. In this context, disruptions in deposit and credit supply during times of distress can be lessened by financial dollarization.

- Financial dollarization may act as a buffer that alleviates the contractionary effects of crises on output. For instance, a currency crash hits depositors severely if most of their deposits are in domestic currency. On the contrary, if a significant share of deposits is denominated in dollars, the crash will have a less adverse effect on household wealth and thus on consumption.
- Credit dollarization leads to a redistribution of currency risk that can potentially be stabilizing. Dollar loans transfer currency risk from banks to firms, thus creating an incentive for the latter to improve their risk management skills and increase their hedging activities. And if banks concentrate most of their dollar lending to creditworthy firms whose income stream is mostly denominated in dollars, default risk will be contained.
- Financial dollarization may allow a greater integration with international capital markets and a richer menu of financial instruments, which may imply efficiency gains for financial intermediation. This greater capital market integration may also enhance banks' management skills, which can be crucial to alleviate disruptions in their operations during periods of financial distress.

However, so far no empirical evidence presents the benefits of financial dollarization except Nicolo et al. (2003, 2005), assessing directly the impact of dollarization on financial development. By extending the work of Honohan and Shi (2003), they find that dollarization promotes a deeper domestic financial system, but only in inflationary economies. This means that dollarization has the effect of moderating the adverse effect of inflation on financial depth. On the contrary, Levy-Yeyati (2006) claims that a consistently low inflation is a precondition for the development of domestic markets in either currency.

II.5.2. Financial Fragility

Financially dollarized economies have been conspicuous among recent financial crises. Especially, the latest financial crisis in Latin America has

started an intense discussion on the potential adverse effects of dollarization on financial sector and macroeconomic stability.

There are many valid concerns with respect to impact of dollarization on financial fragility. Dollarized financial systems are particularly subject to solvency and liquidity risks. The main source of fragility arises from currency mismatches in case of large exchange rate depreciation. When banks accept dollar deposits from domestic residents, they hold foreign exchange risk. When banks lend dollar loans to domestic firms who earn revenue in domestic currency, they do not hedge their foreign exchange exposure, however they only replace currency risk with credit risk. Thus both dollar deposits and dollar credits can play a role in vulnerability of the financial system (Honig, 2004).

If deposit dollarization is high and dollar liquidity is low, banks may not be able to deal with a run on dollar deposits. Currency switching by depositors or deposit withdrawals in response to or in anticipation of a devaluation is a source of volatility to banks, increasing banks need for liquid assets and putting pressure on the value of the local currency. After all, forced sale of these local currency liquid assets will depress the currency and result in capital losses for the bank (Honohon and Shi, 2003). As a result of increasing banking instability, banks' supply of credit may be contracted, reducing investment and making financial distress even more costly (Arteta, 2003). Because of the unique role that banks play in fund channel, most banking crises are followed by major recessions as well as large budgetary costs required to recapitalize the banking system (Honig, 2004).

Jacome (2004) states that increasing financial dollarization, in combination with a low and decreasing trend of the central bank's international reserves, undermines the credibility of financial safety nets, thereby restricting the central banks' capacity to serve as lender of last resort and also governments' ability to manage banking crises effectively.

According to Galindo and Leiderman (2005), public debt dynamics can be another source of concern about dollarization. Calvo, Izquierdo and Talvi (2002) show that the dollarization of public debt played a significant role in explaining the Argentina crash. They argue that the country was fiscally weak, not because of the size of its fiscal deficit, but mostly because of the composition of its debt. Given its high level of dollarization, the fluctuation in the real exchange rate that accompanied the sudden stop in capital flows turned an apparently sustainable fiscal situation into an unsustainable one.

However, Havrylyshyn and Beddies (2003) state that there is no clear evidence that dollarization causes financial crises, indeed the extent to which dollarization affects management of a financial crisis depends not only on the degree of dollarization but also soundness of the financial system and the institutional features of the respective economy.

Several authors aimed to assess whether the widespread dollarization of bank deposits and credits in developing countries renders banking crises and currency crashes more likely or more costly. The empirical results of these studies are as follows:

- Nicolo et al. (2003, 2005) find that dollarized banking sectors exhibit higher risk profiles and deposit volatility.
- Domac and Martinez Peria (2003) find that there is a link between financial dollarization and financial fragility through the balance sheet channel.
- Calvo, Izquierdo and Mejía (2003) provide empirical evidence of the importance of liability dollarization as a predictor of sudden stops in capital flows for emerging market countries, suggesting that dollarization itself can play a leading role in provoking self-fulfilling crises.
- Honig (2004) find little evidence that liability dollarization of the domestic banking system increases the probability of a banking crisis.
- Reinhart et al. (2003) state that partial dollarization does not have first-order adverse effects on monetary policy, especially for the purpose of inflation control. However, it does not mean that partial dollarization does

not present challenges for developing and transition economies, indeed it can create large currency mismatches in developing countries.

- Arteta (2003) documents that there is little evidence of any particular link between high bank dollarization and the likelihood of banking crises or currency crashes. The results suggest that deposit dollarization can potentially act as a buffer and leads to less severe crises; however, credit dollarization does not seem to share this property and might actually lead to deeper crises. In the light of these empirical evidences, Arteta states that dollarization seems to be of second-order importance when it comes to assess the risks and costs of crises. More important are adequate macroeconomic, financial, and exchange rate policies.

II.6. FINANCIAL DEDOLLARIZATION

Ize and Parrado (2002) indicate that if dollarization mainly reflects globalization and is accompanied by sound economic management, it should not be such a matter for great concern. When global shocks, rather than idiosyncratic shocks, dominate the business cycle, there is not much benefit to having a national currency. At the same time, the prudential risks arising from dollarization should be limited when macrofinancial policies are prudent. On the other hand, the dangers of dollarization clearly come to the fore when large real exchange rate changes are likely to be forthcoming, due to sizable idiosyncratic real shocks or the collapse of a nominal exchange rate anchor, and dollarization reflects poor macroeconomic policies that, in the past, have destroyed confidence in the national currency and, in the future, may lead to abrupt switches in policy regimes.

In such cases, some scholars have argued that these highly dollarized countries should go all the way and completely dollarize their economies. However, Licandro and Licandro (2003) state that even in a dollarized economy a non-tradable sector would exist, and the risk of a large adjustment in relative prices would remain. Then, full dollarization does not reduce the financial vulnerability of the economy. Full dedollarization is not the answer either. The same financial matching principle would apply to the

tradable sector if foreign currency operations were forbidden in the financial system. According to Levy-Yeyati and Arias, (2003) neither full dollarization or full dedollarization are the solution, the only way to live in the middle and to reduce dollarization and its risk should be based on two way (pillar) approach that both discourages the use of the dollar and enhances the attractiveness of the local currency as a medium of intermediation. On the one hand, a revision and adaptation of prudential regulation to address ex-ante the externalities associated with financial dollarization, on the other hand, the design and introduction of local currency instrument and the development of markets for these instruments that favor the use of the local currency for financial transactions. Thus, any potential dedollarization strategy should adopt a carrot and stick approach, increasing the cost of dollar intermediation while expanding the menu of domestic currency substitutes and enhancing their attractiveness.

II.6.1. Strengthening of the Safety Nets of the Financial System

Financial regulation in several countries does not fully incorporate the risks involved in the dollarization of their business. Prudential requirements have to be stricter when the financial system leads to an agent that perceives its income in domestic currency, even if that agent is the State itself (Licandro and Licandro, 2003). Thus, measures are needed to ensure that hidden externalities are properly internalized through an enhanced prudential environment (Nicolo et al. 2003, 2005).

Given the positive correlation between exchange rate risk and credit risk in financially dollarized economies, the value of any safety net is typically higher for dollar instruments and has to be priced accordingly. Thus, Levy-Yeyati and Arias (2003) suggest that in order to avoid cross-subsidies, exchange rate risk exposure should be factored in the provision of both deposit and bank insurance. Moreover, implicit insurance and other time inconsistency problems may render market-based measures such as higher risk weights and larger bank contributions to the insurance fund ineffective, justifying a move to quantitative exposure limits. Also, bank liquidity

requirements have to be higher in dollar business, as a way to compensate for the inability of central banks to perform the lender of last resort in foreign currencies in the event of a systemic run (Licandro and Licandro, 2003). Moreover, a dollarised financial system involves two risks (*currency mismatch risk and risk of a bank run in dollar deposits*) that need to be addressed with prudential measures, including an adequate level of net international reserves (Velarde, 2005).

Having said that, all of them share the aim to introduce a domestic currency-dollar wedge in intermediation costs to incorporate externalities associated with contingent fiscal liabilities or unallocated social costs. Conversely, the net benefits of a dedollarization strategy depend crucially on its success in introducing alternative local currency instruments to reroute savings within the domestic market (Levy-Yeyati and Arias, 2003).

II.6.2. Development of Domestic Currency Markets

In heavily dollarized economies since the dollar has taken a dominant position in market place, there is a need for domestic unit of account that can be the basis of a future credit system (Licandro and Licandro, 2003). The local currency should have a natural constituency in countries where monetary independence makes sense. Because of its unique shock-buffering capacity, the local currency, if well managed, should gain a high and stable market share (Nicolo et al. 2003, 2005). The experiences of Poland and Egypt suggest that in countries with a low inflation track record, domestic deposits can gradually become an alternative to the dollar. Alternatives such as indexation could also be relevant. The Chilean and Israeli precedents suggest that CPI-indexed assets may have good chances to compete with dollar assets and eventually reduce financial dollarization (Levy-Yeyati and Arias, 2003). However, while CPI-indexed assets may be an attractive catch-all option for small savers, they may suffer from inadequate demand on the borrowers' side. While indexed instruments should help to reduce dollarization, they are unlikely by themselves to induce a spontaneous switch out of the dollar, unless their introduction are

accompanied by a sound monetary policy and an active regulatory policy (Ize and Levy-Yeyati, 2005).

II.6.3. Monetary Policy and Institutional Framework

Levy-Yeyati and Arias (2003) mention that any successful dedollarization strategy should be accompanied by sound monetary policies, as the Chilean and Israeli experience attest. However, as witness the Argentine convertibility, the Uruguayan crawling peg or the Peruvian managed float, sound monetary policies are necessary but not sufficient. At any rate, a proactive agenda with specific measures aimed at mitigating the presence of externalities and enhancing the attractiveness of local currency assets is needed to complement conducive macro policies.

Moreover, Ize and Powell (2004) state that absent changes in monetary policy, changes in prudential norms, which go beyond the internalization of risk and aim at directly inducing dedollarization, run the risk of further boosting the dollarization and not enough to reduce the fear of floating at all since policymakers might resist the tendency to respond to high dollarization with a fear of floating (Calvo and Reinhart, 2002) that limits the benefits of their currency and boosts instead dollarization.

Luca and Petrova (2003) suggest that one way to reduce dollarization is to reduce macroeconomic uncertainty and lack of monetary policy credibility. Otherwise, as long as domestic deposits are highly dollarized, and banks want to match the currencies of their assets and liabilities, restrictions placed on dollar loans will most likely lead to “exports” of deposits and domestic disintermediation.

Ize and Powell (2004) clarify that for serious de-dollarizers, a comprehensive, well-coordinated, step-by-step, policy response should include measures to enhance; the credibility of monetary policy, market enhancements, institutional reforms (aim at reducing bankruptcy cost and

thereby fear of floating) and market infrastructure reforms such as payments system improvements.

However, Ize and Yeyati (2003) argued that, whereas a tight monetary policy that attempts to reduce dollarization by tilting the domestic interest rate differential in favor of home deposits is bound to increase loan dollarization, tax-based or regulatory policies, while more effective to reduce dollarization, are likely to have substantial costs in terms of capital flight and financial disintermediation. In contrast, a credible, full-fledged inflation-targeting regime in which the exchange rate is allowed to fluctuate freely within the limits set by the inflation target should gradually reduce financial dollarization. Also, flexibility of exchange rate regime provides opportunities for the central bank to demonstrate its managing skills, thereby building up its credibility (Ize, 2005).

Galindo and Leiderman (2005) conclude that dedollarizing an economy can be a very difficult and very costly task. In fact, very few countries in the globe have been able to dedollarize the financial sector as well as dedollarizing public sector debt.

CHAPTER III

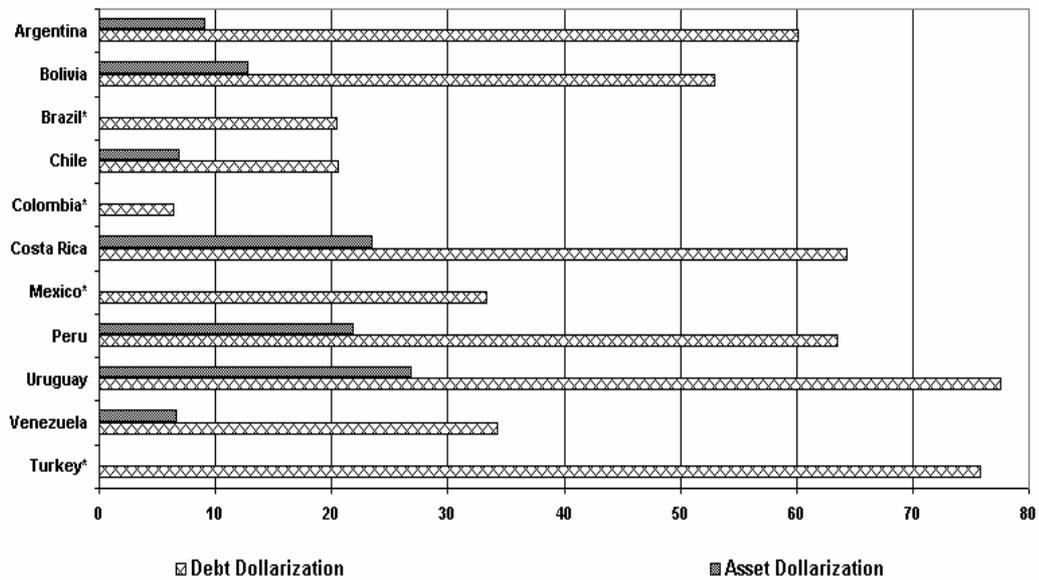
FINANCIAL DOLLARIZATION OF CORPORATE SECTOR IN LATIN AMERICA AND TURKEY

In Latin America, dollarization of assets and liabilities has risen during 1980s and 1990s, making Latin America one of the most dollarized regions in the world.¹ Singh et al. (2005) mention that according to IMF staff estimates, the ratio of foreign currency deposits to GDP is substantially higher in Latin America (21.1) than in transition economies (8.8) or (non Latin American) low-income countries (7.8).

A more detailed picture of currency composition in Latin America can be obtained for a smaller sample of countries at firm level from the Inter-American Development Bank database (Kamil, 2004). The extent of dollarization varies widely among Latin American countries. By the end of 2001, financial dollarization was significant in Argentina, Bolivia, Costa Rica, Peru and Uruguay. Figure III.1 shows that in all these countries, foreign currency debts and assets accounted for approximately 64 and 19 percent of total liabilities and assets respectively. Since Brazil, Chile, Colombia and Venezuela have enforced strict regulations on financial transactions in foreign currency, dollarization level is modest in these countries. On the other hand, as compared with Latin American countries Turkey appears to be the most heavily dollarized country among others (except Uruguay) that in Turkey level of debt dollarization is 76 percent (from non-financial corporate sector level data grouped by the Central Bank of the Republic of Turkey). However, in the case of Uruguay interpretations should be made carefully since the observations (number of firms) are limited in the data set.

¹ The levels and trends of corporate sector asset and debt dollarization in ten Latin American countries and Turkey are provided in appendix.

Corporate Sector Asset and Debt Dollarization in Latin America and Turkey, 2001 (Percent)



* Denotes countries where there is no information on asset dollarization.

Note: Debt Dollarization Ratio = Dollar-linked debt as a percentage of total liabilities.
 Asset Dollarization Ratio = Dollar-linked assets as a percentage of total assets.

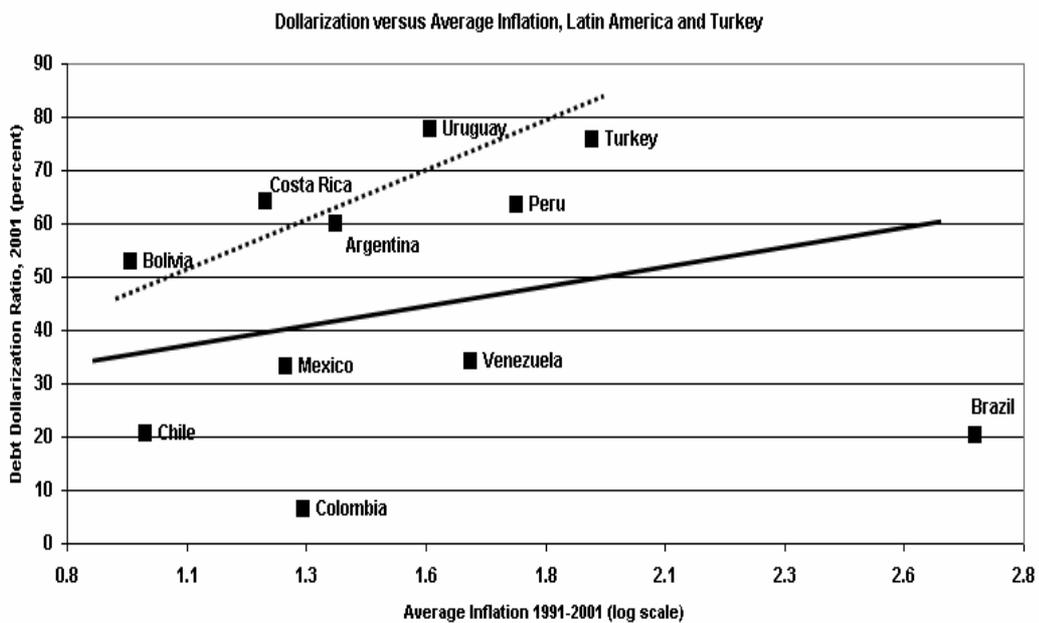
Source: Kamil (2004)

Figure III.1. Corporate Sector Asset and Debt Dollarization in Latin America and Turkey, 2001

In many of these Latin American countries, dollarization began as a response of economic agents to a loss of confidence in the domestic currency. High levels of inflation, interest rate spread, devaluation expectations, low credibility about domestic macroeconomic policies, and chronic volatility associated with monetary financing of budget deficits induced a switch to dollar denominated assets and liabilities (Galindo and Leiderman, 2005). Similarly in Turkey, dollarization phenomenon started after the financial liberalization process that took place in the early 1980s. Since then dollarization have continued to increase due to mainly high and variable inflation, exchange rate risk, political uncertainty, weak institutions, macroeconomic vulnerability and the lack of instruments to hedge against exchange rate risk (Serdengecti, 2005).

III.1. Inflation Rate and Exchange Rate Changes

Over past three decades, Latin America has suffered from high inflation rates. Indeed, during these period Latin American countries have had higher average rates than any other region. In fact, these ten Latin American countries can be divided into three that Colombia and Chile has had persistently low inflation rates; Mexico, Uruguay and Venezuela has had high inflation rates at least one of the decades; Argentina, Bolivia, Brazil and Peru have experienced periods of hyperinflation over the past 20 years (IADB, 2004). Similarly, chronic inflation was the major problem of the Turkey during past two decades until the early 2000s.



Source: Kamil (2004) and IFS.

Figure III.2. Dollarization versus Average Inflation, Latin America and Turkey

There is positive correlation between the dollarization and previous inflation history in the countries of the region. The countries in which dollarization

exceeds 50 percent (especially Turkey, Peru, Uruguay, Argentina) have had high levels of average inflation over the past decade. This positive correlation is evident in Figure III.2, which plots dollarization levels in 2001 against average inflation in 1991–2001. Brazil—with a high level of past inflation but low levels of dollarized deposits—is an outlier in this figure because of restrictions on dollar-denominated deposits. This correlation suggests that monetary policy credibility, captured here by measures of past inflation history, is one of the driving factors in financial dollarization.

In financially dollarized countries, debt instruments make firms more vulnerable to interest rate and exchange rate shocks. An increase in interest rate leads to rise in debt burden of those firms. On the other hand, Licandro and Licandro (2003) mention that interest rate ceilings, unable to compensate depositors for inflation and the lack of inflation indexed assets, forced savings out of national currency and into dollar denominated assets. Similarly, real exchange rate depreciation reduces the debtor capacity to repay especially the unhedged non-tradable firms. Countries experienced large depreciations in the past tend to have large dollarization of both credit and deposit (Arteta, 2002).

In recent years it has been observed that financial dollarization has been growing in Latin America and Turkey over time in spite of a major reduction in inflation and a shift toward fiscal consolidation and central bank independence. Standard portfolio theory has been used to explain such observed hysteresis in dollarization. Ize and Levy-Yeyati (1998 and 2003) argue that domestic residents prefer to denominate contracts in foreign currency when its purchasing power in terms of domestic consumption is stable relative to that of domestic currency. This means that expected real exchange rate volatility relative to inflation volatility is the relevant driving force of dollarization. They find that in several of the dollarized Latin American countries real exchange rate volatility has declined as much or more than inflation volatility.

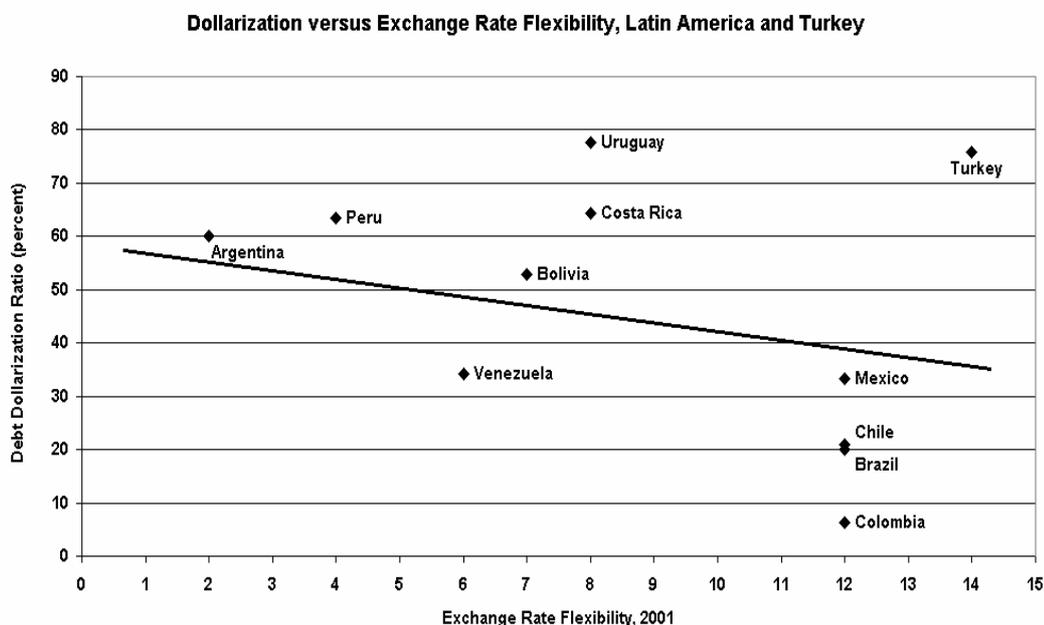
Additionally, Singh et al. (2005) state that the persistence of dollarization in Latin America inspite of the decline in inflation can be reflected a policy framework that did little to discourage financial transactions in foreign currency:

- Until recently, many of these governments often accepted or encouraged dollarization in the hope that it would help remonetize the economy, accelerate financial development, and reverse capital flight (Savastano, 1996).
- Large fiscal deficits in some countries, such as Costa Rica, put upward pressure on domestic currency interest rates, contributing to the incentive to borrow in U.S. dollars.
- The structure of the banking system has also influenced the extent of dollarization (Catão and Terrones, 2000).
- Dollarized countries have tended to limit fluctuations in their exchange rate—either through a crawling peg or a managed float—to help control inflation and to avoid an increase in the cost of servicing loans in U.S. dollars. The limited exchange rate volatility has made it easier for residents to keep their savings in foreign currency while paying for goods and services in local currency. Indeed, the volatility of the real bilateral exchange rate has been less than the volatility of inflation in highly dollarized countries.

III.2. Exchange Rate Regimes

As discussed in Chapter II, there are two views on the links between dollarization and exchange rate regimes that fixed versus flexible exchange rate regimes encourages de facto dollarization. The Latin American experience with a rigid exchange rate in the 1990s shows pegging can hide currency risk and create incentives for dollarization (Herrera and Valdes, 2004). As shown Figure III.3, Kesriyeli, Ozmen and Yigit (2005) mention that the countries with currency board (Argentina) and crawling pegs (Bolivia, Costa Rica, Peru, Uruguay and Venezuela) are more dollarized than the countries with floating exchange rate regimes (Brazil, Chile, Colombia and

Mexico). On the other hand, Turkey is an exceptional case that she is a heavily dollarized country with floating exchange rate regime.



Source: Kamil (2004) and Reinhart and Rogoff (2002)

Figure III.3. Dollarization versus Exchange Rate Flexibility, Latin America and Turkey

It is worth noting that the countries with relatively low levels of dollarization, Brazil, Chile, Colombia and Mexico, have tried to avoid domestic financial dollarization by banning or highly restricting the foreign transactions in foreign currency (IMF Annual Report on Exchange Arrangements and Exchange Resrictions- AREAER).

Since, there is a big gap between what countries say about (de jure) their exchange rate regimes and what they actually do (de facto), the Table III.1 and Figure III.3 are formed according to Reinhart and Rogoff (2004) de facto exchange rate classifications.

As seen in Table III.1, Latin America shows a strong and continuing trend from pegged exchange rate regimes toward more flexible arrangement during the last decade.

Table III.1. Exchange Rate Regimes in Latin America and Turkey

Argentina	Dec.1990-Mar1991	Freely Falling
	Apr.1991-Dec.2001	Currency Board
Bolivia	Nov.1987-Dec.2001	De Facto Crawling Peg
Brazil	Apr.1989-July1994	Freely Falling
	July1994-Jan.1999	Pre-announced Crawling Peg
	Feb.1995-Dec.2001	Freely Falling
Chile	June1989-Jan.1992	Pre-announced Crawling Peg
	Jan.1992-June1998	De Facto Crawling Peg
	June1998-Sep.1999	Pre-announced Crawling Peg
	Sep.1999-Dec.2001	Managed Floating
Colombia	Dec.1984-Jan.1994	De Facto Band
	Jan.1994-Sep.1999	De Facto Crawling Band
	Sep.1999-Dec.2001	Managed Float
Costa-Rica	Nov.1983-Dec.2001	De Facto Crawling Peg
Mexico	Dec.1988-Nov.1991	Crawling Peg
	Nov.1991-Apr.1992	De Facto Crawling Peg
	May.1992-Jan.1994	De Facto Peg
	Feb.1994-Dec.1994	Pre-announced Crawling Band
	Dec.1994-Mar1996	Freely Falling
	Apr.1996-Dec.2001	Managed Floating
Peru	Dec.1986-Nov.1993	Freely Falling
	Nov.1993-Mar1999	De Facto Crawling Band
	Apr.1999-Dec.2001	De Facto Peg
Uruguay	Dec.1990-Dec.1991	Pre-announced Crawling Band
	Dec.1991- Sep.1995	Freely Falling
	Oct.1995-Dec.2001	De facto Crawling Band
Venezuela	Apr.1990-July 1996	Freely Falling
	July.1996-Dec.2001	Pre-announced Crawling Peg
Turkey	May.1984-Jan.1998	Freely Falling
	Feb.1998-Jan.2001	Crawling Band
	Feb.2001-Oct.2001	Freely Falling

Source: Reinhart and Rogoff (2004)

III.3. Inflation Targeting

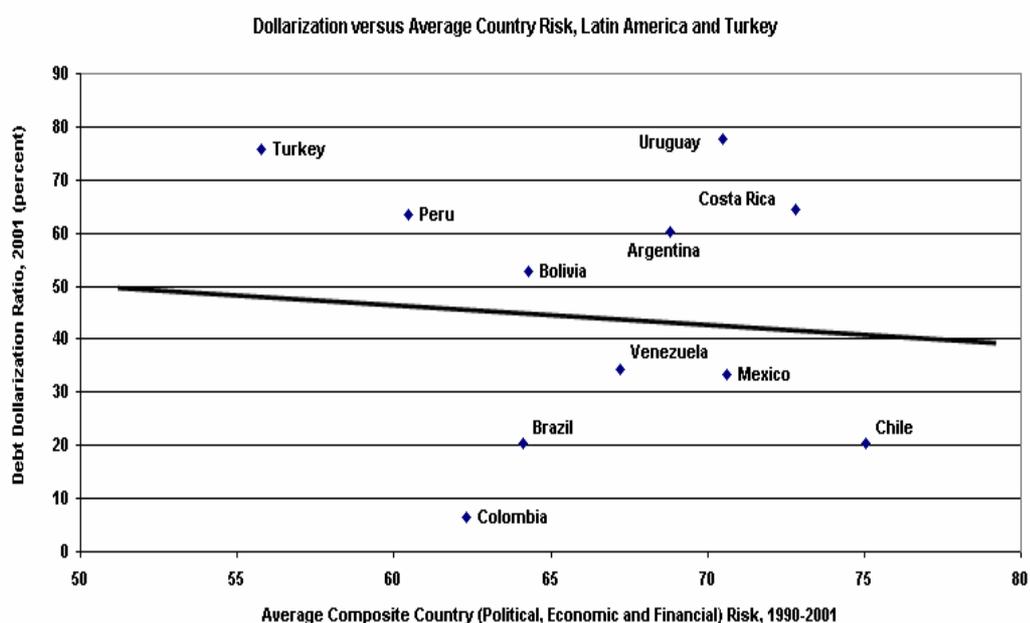
Inflation targeting is gaining in popularity among both industrial and emerging economies. Brazil, Chile, Colombia, Mexico and Peru are the five Latin American countries adopted this monetary framework. Except Brazil for other Latin American countries, the transition to full-fledge inflation targeting has been gradual. Firstly, Chile started to announce inflation targets in 1990 and the period 1990-1999 is the gradual convergence toward full-fledge inflation targeting. Colombia began to announce inflation targets in 1991, however like Chile during the transition period (1991-1999), she also targeted exchange rate as an anchor. Peru implemented full-fledge inflation targeting in 2002, however, since 1994 she announced inflation targets. After the twin balance of payments and financial crises that hit Mexico in 1994-1995, Mexico witnessed an evolution of monetary policy toward inflation targeting between 1995 and 2001. In 1999, Mexico defined annual inflation targets to reinforce the role of inflation targeting and raise policy transparency. On the other hand, Brazil followed a different approach from other Latin American countries and established most inflation targeting features from the very beginning (Schmidt-Hebbel and Werner, 2002).

Mishkin and Posen (1997) and Calvo and Mishkin (2003) argue that the adoption of inflation-targeting regimes has institutional effects that go beyond their actual success in stabilizing inflation. These authors claim that inflation targeting might contribute to monetary credibility by increasing information disclosure on central bank policies and objectives and by contributing to shoring up public support for central bank independence. Therefore, these policies should lead to low and stable inflation rates and, in the medium run, to monetary policy credibility and lower financial dollarization.

III.4. Institutional Determinants

Many economists and social scientist argue that economic and political institutions and economic outcomes are related. As shown Figure III.4, the

countries with weak institutional quality also the countries with high dollarization level. Since the composite country (political, economic and financial) risk index represents that the lower the risk point, the higher the risk (International Country Risk Guide), Turkey is the most heavily dollarized country also has the weakest institutional quality in the sample. It is also true for the Peru, Bolivia and Argentina, on the other hand, Chile and Mexico have both strong institutional quality and less dollarization level.

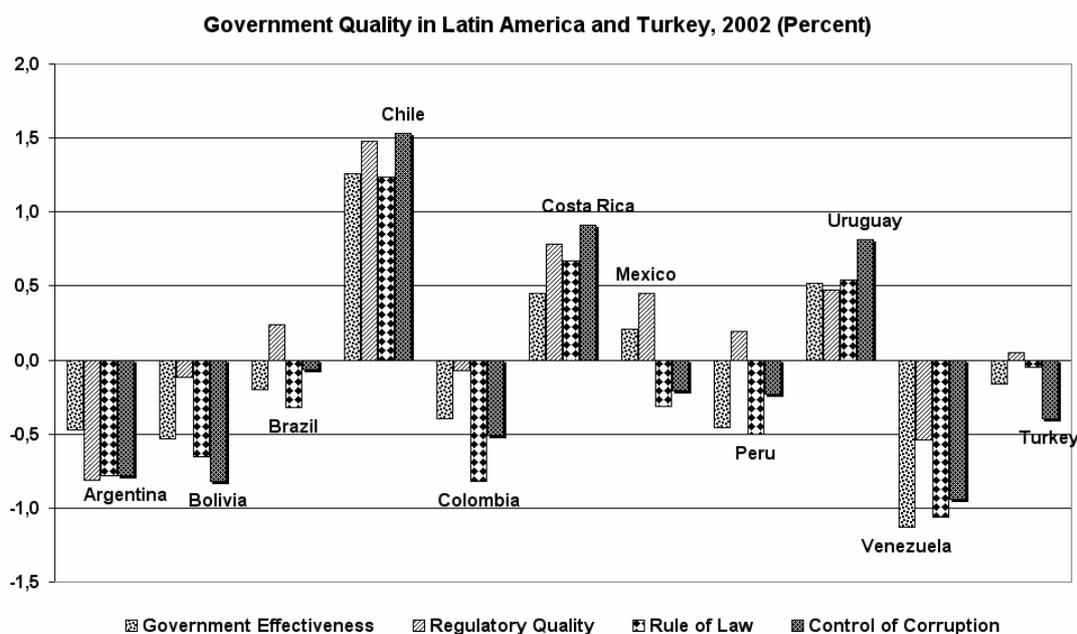


Source: International Country Risk Guide (PRS Group)

Figure III.4. Dollarization versus Country Risk in Latin America and Turkey, 2001

A more detailed picture of institutional quality in Latin America and Turkey can be obtained from Kaufmann, Kraay, and Mastruzzi (2005) data set that presents the aggregate governance indicators, measuring the following six dimensions of governance. They divide broad definition of governance as the traditions and institutions into three: (i) the process by which governments are selected, monitored and replaced: *Voice and*

Accountability and Political Instability and Violence; (ii) the capacity of the government to effectively formulate and implement sound policies: *Government Effectiveness and Regulatory Burden*; (iii) the respect of citizens and the state for the institutions that govern economic and social interactions among them: *Rule of Law and Control of Corruption*.



Source: Kaufmann, Kraay, and Mastruzzi (2004)

Figure III.5. Government Quality in Latin America and Turkey, 2002

Figure III.5 displays that almost all of the Latin American countries have problems with rule of law, regulatory quality, corruption and the ineffectiveness of governments in providing essential public services. These problems with Latin America's institutions are serious even in comparison with other developing regions and they constitute a significant barrier to the region's economic progress and social development (IADB, 2005). Moreover, the institutional structure of Latin America and Turkey can be more directly related with countries dollarization levels of Latin American countries and Turkey. All indicators suggest that Chile has the most strong government quality; on the other hand, Turkey, Peru, Argentina, Bolivia, and

Venezuela are the countries with weak government quality and high dollarization levels in all indicators.

III.5. Financial Vulnerability

In the 1990s and early 2000s, a number of Latin American countries and Turkey have experienced external and financial crises such as Mexico (1994-95), Argentina (1995, 2001-02), Brazil (1998-99), Uruguay (2002) and Turkey (1994, 2000-2001). Compared with other regions, Latin America ranked the highest in terms of the average number of crises per country (1.25) in 1974-2003 (IADB, 2004).

As mentioned by Inter American Development Bank (2004), many of the most recent crises in Latin America can be linked to external factors leading to liquidity constraints and contagion across capital markets, especially sudden stops in capital flows have had profound effect in the region. Sudden stops have typically been accompanied by banking crises, particularly in cases of high liability dollarization. IADB (2004) analysis indicates that for the case of highly dollarized countries, about 75 percent of sudden stops have materialised together with banking crises and this figure increases to 100 percent when dollarization is accompanied by a fixed exchange rate regime. For this reason, a series of papers have argued that foreign currency denominated asset and liabilities played an important role in recent "crisis" episodes in Latin America and as such is an important source of financial fragility. The key risks for the financial systems arising in highly dollarized countries have come from increased susceptibility to liquidity squeezes caused by deposit runs and an underpricing of credit risk that have undermined the solvency of the banking system and destabilized economies (Singh et al., 2005). On the other hand, the financial fragility of firms with foreign exchange debt to external shocks relies on the currency and maturity mismatches of the firms.

III.6. De-Dollarization in Latin America

Galindo and Leiderman (2005) conducted a special survey of a set of policymakers in Latin American countries in order to understand efforts to dedollarize or to deal with dollarization. The results of the survey suggest that countries with high levels of dollarization are not adopting active and direct policies to reduce the level of dollarization, although their policymakers are very aware of the risks. Dedollarization is expected to be a side effect of prudent fiscal and monetary policies, complemented with efforts to develop local currency debt markets or markets for CPI indexed financial instruments. Therefore, only a few Latin American countries have managed to avoid, or achieve a significant reduction in financial dollarization. Galindo and Leiderman (2005) identify only one Latin American country, Chile as successful experiences of dedollarization of the financial sector. On the other hand, Reinhart, Rogoff and Savastano (2003) note that only Mexico in Latin American countries has been able to dedollarize their financial system successfully.

As shown Figure III.1, less dollarized Latin American countries are Brazil, Chile, Colombia and Mexico. A variety of influences have helped sustain the use of domestic currencies in those countries (Singh et al., 2005). These include the following:

- Macroeconomic policies in Chile, Colombia, and Mexico had sufficient credibility to help limit dollarization.
- Since 1980, real interest rates on domestic currency deposits have remained positive in Brazil, Chile, and Colombia.
- Financial instruments indexed to inflation were made available in Brazil, Chile, Mexico, and Colombia.
- Brazil, Colombia, Mexico and Venezuela have tried to avoid domestic financial dollarization by banning or highly restricting the possibility of issuing deposits in foreign currency.

More specifically, Herrera and Valdes (2004) state that Chile is a successful case of long dedollarization process. The factors that appear to be most

important to elude dollarization in Chile can be separated into two groups: pre conditions such as existence of a well grounded, credible, and trustworthy indexing unit, the UF, the strength of fiscal accounts, the existence of a private, fully-funded pension system and policy reactions such as capital controls that probably limited currency mismatches, macroeconomic framework and tools embracing indexation and even encouraging it in financial markets and persistent indexation process.

As mentioned by Galindo and Leiderman (2005), a few experiences in Latin America show that public debt dollarization has been partially reverted. The most notable is perhaps the Mexican case that the composition of debt in Mexico has changed dramatically since the mid-1990s. This has been the result of strong and consistent fiscal consolidation accompanied by a prudent monetary policy. Few other countries in Latin America have been able to follow Mexico's path. Probably one of the most interesting cases in which the composition of debt has changed is Brazil that has represented significant shift from external to internal debt; however, within internal debt foreign currency indexed debt has gained participation. Like Brazil, other countries in the region have increased the depth of local public debt markets. Indeed, in the cases of Bolivia and Uruguay there is an active policy to reduce public sector dollarization through the development of CPI-indexed debt instruments. Moreover, this option is currently under study in Costa Rica. Countries such as Chile and Peru have considered the option, but have preferred to develop and deepen a market in domestic nominal (nonindexed) financial assets rather than CPI-indexed bonds.

CHAPTER IV

THE ECONOMETRIC FRAMEWORK

IV.1. THE MODEL and DATA SET

The purpose of this study is to analyse the determinants of firm-level debt and asset dollarization in ten Latin American countries (Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Mexico, Peru, Uruguay and Venezuela) and Turkey for the period 1990-2001.

In order to investigate whether monetary policy stance, institutional structure and macroeconomic factors have influence on financial dollarization in those countries, panel data techniques are employed. Panel data analysis *provides a rich environment for the development of estimations techniques and theoretical results that could not be studied in either cross-sectional or time series settings* (Greene, 1997). According to Hsiao (1986), advantages of using panel data include the following: (1) Panel data methods allow for greater degrees of freedom, which is particularly important when the sample size is too small to meaningful use either cross-sectional or time-series techniques. (2) These techniques reduce the collinearity among explanatory variables – hence improve the efficiency of econometric estimations. (3) Cross-sectional analysis ignores dynamic effects and both cross-sectional and time series techniques are restricted to two-country comparisons, which may lead to difficulties when comparing economies of different sizes.

In this analysis, dollarization level is specified as a function of exchange rate flexibility (*FER*), adoption of a de facto inflation-targeting regime (*IT*), institutional quality (*IQ*), volatility of inflation rate (ΔINF) and real exchange rate change (ΔRER , *an increase in RER denotes real appreciation*). The linearly formed econometric model is as follows:

$$Dollarization_{it} = \beta + \alpha FER_{it} + \delta IQ_{it} + \lambda \Delta INF_{it} + \varphi \Delta RER_{it} + \eta_{it} \quad (1)$$

Dollarization stands for a measure of either debt or asset dollarization ratio. Debt dollarization ratio is measured as dollar-linked debt as a percentage of total liabilities, on the other hand, asset dollarization ratio is measured as dollar-linked assets as a percentage of total assets. The dollarization data are obtained from two sources, namely the Inter-American Development Bank database that is un-balanced panel of annual firm-level data for approximately 2000 non-financial firms in ten Latin American countries for the period 1990-2002 (Kamil, 2004) and the Central Bank of the Republic of Turkey database that compiled the non-financial corporate sector dollarization in Turkey for the period 1992-2003. Data on debt dollarization is available for all countries in the sample, however, data on asset dollarization is available for eight Latin American countries (not available for Brazil, Colombia and Turkey) and time span varies across countries for both type of dollarization.

In the literature, one of the debates about the causes of financial dollarization relates to the flexibility of exchange rate regimes. There are two views on the links between regimes and dollarization that fixed versus flexible exchange rate regimes encourages de facto dollarization. In order to investigate the relationship between exchange rate regimes and financial dollarization, Reinhart and Rogoff (2004) de facto classification is used as a proxy for exchange rate flexibility. This extensive database on market determined parallel exchange rates classify de facto exchange rate arrangements into fifteen categories, goes back to 1946 for 153 countries and unfortunately ends by 2001. Although the firm-level dollarization data is available for the period 1990-2002, empirical analysis consists the period of 1990-2001 due to data limitations on exchange rate regime. In fact, only Argentina, Bolivia, Brazil and Turkey have the debt dollarization and solely Bolivia has asset dollarization data for 2002. Therefore, only a few observations are lost due to data limitation.

As argued by many economists, inflation targeting should help reduce financial dollarization. In the sample, Brazil (1999), Chile (1999), Colombia (1999), Mexico (2001) and Peru (2002) implemented full-fledge inflation targeting (World Economic Outlook, September 2005). The dates in parenthesis indicate countries when de facto adopted inflation targeting, the official adoption dates may vary. Turkey also adopted implicit inflation targeting in 2002 but she will adopt full-fledged inflation targeting by 2006. Since the classification criterion is the adoption of de facto inflation targeting, she is not considered as an inflation targeter.

Many economists and social scientist argue that economic and political institutions and economic outcomes are related. Since countries' institutional quality is seen as a source for financial dollarization, composite risk rating of countries is used as a proxy in the model. International Country Risk Guide (ICRG), produced by Political Risk Services since 1982, analyses the political (with 12 components), economic (6 component) and financial (5 component) environments in a large number of developed and developing countries. The Political Risk Index, providing a means of assessing the political stability, assembles the indicators of governance quality along twelve different dimensions: government stability, socio-economic conditions, investment profile, internal conflict, external conflict, corruption, military in politics, religion in politics, law and order, ethnic tensions, democratic accountability and bureaucracy quality. The Economic Risk Index, providing a means of assessing a country's current economic strengths and weaknesses, comprises five economic risk components: the GDP per head, real GDP growth, annual inflation rate, budget balance as a percentage of GDP and current account as a percentage of GDP. The Financial Risk Index, providing a means of assessing a country's ability to pay its way, comprises foreign debt as a percentage of GDP, foreign debt service as a percentage of exports of goods and services, current account as a percentage of exports of goods and services, net international liquidity as months of import cover and exchange rate stability. The use of composite political, economic and financial risk ratings represents the weighted sum of

all components and higher scores indicate low country risk and well functioning institutions.

Existing literature on de facto dollarization offers a number of macroeconomic variables such as volatility of inflation rate and real exchange rate change² that may affect dollarization. High and variable inflation rate can be a key determinant of dollarization as it reflects the macroeconomic mismanagement. In the absence of alternative local currency instruments, high and volatile inflation may fuel financial dollarization as a rational response of economic agents. Large and sudden downward movements of the exchange rate can increase asset dollarization, on the other hand, it can lead to a reduction in debt dollarization since exchange rate depreciation can bring a deterioration in the value of firms' assets compared to its liabilities (Kamil, 2004). Following devaluation, an agent with a currency mismatch sees the domestic value of his debt expand by more than that of his assets or income. On the other hand, with imperfect capital markets, supply of funds can be as important determinant of the debt composition as demand, hence the level of debt dollarization is also affected by bank's decisions that an increase in devaluation risk can increase loan dollarization. The intuition behind these results is straightforward. As banks seek to maximize their profits in dollars, and the interest rate on domestic loans is fixed, if devaluation occurs after the loan is disbursed its return in dollars will decline, reducing the bank's profits. So, if devaluation expectations are high, banks will tend to minimise the domestic component of their loan portfolio (Catao and Terrones, 2000). In addition, since exchange rate devaluations lower the value of non-traded collateral and increase the risks of default-dollarized loans, banks reduce their lending. In this analysis, inflation rate is derived by CPI index, which is obtained from IMF International Financial Statistics (IFS) and real exchange rate change is

² In fact since dollarization ratio is measured as dollar-linked debt (asset) as a percentage of total liabilities (assets), there is a valuation effect linking exchange rate changes with measured dollarization shares. It should be considered that any dollarization ratio will automatically increase or decrease after the exchange rate change even if the stock of dollar denominated asset and debt remains unchanged (Kamil, 2004).

derived by real effective exchange rate index obtained from IFS for Chile, Colombia, Costa Rica, Uruguay and Venezuela, and JPMorgan Real Broad Effective Exchange Rate database for Argentina, Brazil, Mexico, Peru and Turkey.

IV. 2. EMPIRICAL RESULTS

In this section, the empirical findings of the econometric analysis are presented. Based on the analytical framework discussed in the previous chapters, whether monetary policy stance, institutional structure and macroeconomic indicators are the driving factors of both debt and asset dollarization is tested by running regressions using the firm level data in ten Latin American countries and Turkey for the period 1990-2001. The models presented in equations (1.1-2) and (2.1-2) are estimated by panel data techniques. Empirical results are reported in Tables IV.2.2 and IV.2.3 for the evaluation of statistical significance, the level of significance for each coefficient is reported in the tables.

Table IV.2.1 shows the descriptive statistics of both dependent and independent variables. The average of debt dollarization is 43% for Latin America and Turkey during 1990-2001. The maximum debt dollarization level belongs to Uruguay (2000) and the minimum belongs to Colombia (1998). On the other hand, the average of asset dollarization is 11% that is far lesser than debt dollarization. In fact, data on asset dollarization is not available for Brazil, Colombia and Turkey. Nevertheless, it is still true that except Brazil, Colombia and Turkey, average debt dollarization (47%) is four times higher than asset dollarization ratio. Similarly, the maximum asset dollarization level belongs to Uruguay (2001), however, the minimum belongs to Mexico (1992). The average flexibility of exchange rate regime is approximately 9, which indicates the pre announced crawling band that is wide than or equal to +/- 2% in the region. The average ICRG index for country risk is 66%. While Chile has the highest institutional quality in the sample, Turkey has the lowest one.

Table IV.2.1. Descriptive Statistics of Variables

	DD	AD	FER	IT	GQ	Δ INF	Δ RER
Mean	0,43	0,11	9,24	0,07	0,66	-0,07 (-0,086)	0,02 (0,014)
Median	0,44	0,09	9,50	0,00	0,67	-0,15 (-0,019)	0,02 (0,024)
Max	0,84	0,27	14,00	1,00	0,82	4,02 (0.866)	0,97 (0,678)
Min	0,05	0,03	2,00	0,00	0,44	-2,27 (-2.746)	-0.31 (-0,379)
Std.Dev.	0,22	0,06	3,35	0,26	0,07	0.63 (0,444)	0.13 (0,112)
Skewness	0,01	0,78	-0,31	3,20	-0,77	2,42 (-4,111)	3.16 (1,154)
Kurtosis	1,95	2,67	2,26	11,28	3,49	17,39 (23,411)	26,27 (12,464)
Jarque Bera	4,47	7,81	5,17	603,45	14,59	1267,66(2663,4)	3198,41 (521.89)
Probability	0,11	0,02	0,07	0,00	0,001	0,00	0,00
Observation	100	70	132	132	132	132	132

Note: Δ INF and Δ RER are calculated by taking the difference of the natural logarithm of CPI and real effective exchange rate index. In order to analyze descriptive statistics of the volatility of inflation rate and real exchange rate change, the values of these variables are defined in terms of percentage change in inflation and real effective exchange rate index. Also the values in the parenthesis indicate the difference of the natural logarithms. *The volatility of inflation rate Δ INF is the difference in inflation.*

Tables IV.2.2 and IV.2.3 report the results of the model to explain the debt and asset currency composition of the firms in Latin America and Turkey. Both equations present the results of the constant coefficient (Estimated) Feasible Generalised Least Squares (GLS, with cross-section GLS weights) with coefficient standard errors that are robust to within cross-section residual correlation and heteroscedasticity (Arellano, 1987). As shown Equation (1.1) and (2.1), all the variables are statistically significant and have the expected coefficient signs.

Table IV.2.2. Determinants of Debt Dollarization

	Equation (1.1)	Equation (1.2)
Dependent Variable	DD	DD
Constant	1.179*** (0.127)	0.020 (0.039)
<i>FER</i>	-0.014*** (0.002)	-0.001 (0.001)
IT	-0.192*** (0.039)	-0.024*** (0.006)
GQ	-0.862*** (0.178)	0.004 (0.047)
Δ INF	0.091*** (0.019)	0.002 (0.011)
Δ RER	-0.172*** (0.065)	-0.129*** (0.031)
DD(-1)		0.991*** (0.019)
N	100	89
Diagnostics	$R_w^2=0.80$, $R^2=0.14$ s.e=0.19	$R_w^2=0.81$, $R^2=0.12$ s.e=0.20

Notes: The values in parentheses are the coefficient standard errors (d.f. corrected) that are robust to within cross-sectional residual correlation and heteroscedasticity (white cross-section). N is the effective number of observations. R_w^2 is the weighted R^2 from the EGLS (Cross-sections weights). *, ** and *** denote the significance at the 10, 5 and 1 %, respectively.

Table IV.2.3. Determinants of Asset Dollarization

	Equation (2.1)	Equation (2.2)
Dependent Variable	AD	AD
Constant	0,279*** (0,063)	-0,001 (0,026)
FER	0,002* (0,001)	0,001 (0,001)
IT	-0,045*** (0,015)	-0,007 (0,012)
GQ	-0,274*** (0,084)	0,009 (0,035)
Δ INF	0,031*** (0,005)	0,017*** (0,006)
Δ RER	-0,064*** (0,020)	-0,025 (0,034)
AD(-1)		0,986*** (0,000)
N	70	62
Diagnostics	$R_w^2=0.25$, $R^2=0.06$ s.e=0.05	$R_w^2=0.91$, $R^2=0.79$ s.e=0.03

NOTES: The values in parentheses are the coefficient standard errors (d.f. corrected) that are robust to within cross-sectional residual correlation and heteroscedasticity (white cross-section). N is the effective number of observations. R_w^2 is the weighted R^2 from the EGLS (Cross-sections weights). *, ** and *** denote the significance at the 10, 5 and 1 %, respectively.

Both equations (1.1) and (2.1) support the conventional view that dollarization is more likely to appear in countries having suffered high and volatile inflation, as a rational response to weak monetary policies. Depositors are unwilling to save in assets and lenders are unwilling to lend in domestic currency with uncertainty in real returns when they believe inflation to be volatile. Denominating contracts in a foreign currency protects borrowers and lenders against inflationary risk.

The empirical results presented by equations (1.1) and (2.1) suggest that an increase in the real exchange rate (real appreciation) discourages both debt and asset dollarization. In general, higher devaluation/depreciation might reduce the credibility of the domestic currency, and thus cause a switch from domestic currency deposits and loans, to those denominated in foreign currency. Conversely, higher appreciation encourages the use of domestic currency. In fact, since the real appreciation decreases the real cost of dollar-debt in terms of domestic currency, firms tend to borrow in foreign currency. On the other hand, as banks seek to maximise their profits in dollars, in the case of real appreciation they tend to maximise the domestic component of their loan portfolio, hence decrease their dollar share of total loans. As shown empirically by Luca and Petrova (2003), main driving forces of credit dollarization are the bank specific factors rather than firm specific factors. Additionally, since banks are the important source of credit for firms in Latin America and Turkey, even firms have an incentive to borrow in dollars in the case of real appreciation, banks can limit firms' ability to borrow in dollars as domestic currency loans is more attractive for banks. In addition, this result consistent with the Benavente et al. (2003) who aim to explain why Chilean firms tend to borrow in foreign currencies find that a currency depreciation affects positively the level of dollar denominated debt. Since tradeable firms, which have dollar denominated debt, are moved to increase investment to take advantage of the positive effect of the depreciation on their competitiveness, they finance the higher investment by resorting to more dollar denominated debt.

Real appreciation is also statistically significant in explaining asset dollarization. An increase in real appreciation leads to a reduction in the firms' holdings of foreign currency denominated assets. Since the depreciation of the national currencies with respect to the dollar generated a reason to hold dollar denominated assets, in the case of appreciation there is no need to stay away from national currency. However, these results are contrast with Arteta (2002) and Honig (2005a) who find that the performance of current exchange rate change is relatively poor in their analysis. Honig (2005a)'s explanation for his result is the hysteresis that higher past uncertainty with respect to exchange rate level might have an impact in the present and/or stems from weak government fundamentals.

The findings of the equation (1.1) provide evidence that the higher flexibility of the exchange rate regime reduces debt dollarization. This result consistent with the common belief that fixed exchange rate regimes are provide implicit insurance guarantee against changes in the exchange rate and reduce agents' incentives to hedge their foreign currency exposure. Fisher (2001) clearly states these biased incentives towards foreign currency borrowing in a pegged regime: *"The belief that the exchange rate will not change removes the need to hedge, and reduces perceptions of the risk of borrowing in foreign currencies"*. This means that floating exchange rate regimes would encourage agents to limit their exposure to exchange rate risk. On the other hand, contrary to the implications of the majority view, equation (2.1) reports that asset dollarization is significantly higher under floating regimes. This result indicates that the greater exchange rate flexibility enhances the attractiveness of dollar assets as agents seek to ensure themselves against currency risk. The decision to hold domestic versus foreign currency assets is based on relative expected returns and also on relative volatilities as well (Ize and Levy-Yeyati 2003), and it is possible that under floating regimes, the relative volatility is greater than under fixed regimes. With an implicitly assumption that all domestic agents, banks and firms, expect domestic currency to depreciate in the future, meaning that floating exchange rate regimes imply an increase in expected

depreciation and therefore an increase in the relative expected return to investing in dollars fosters asset dollarization. These results also consistent with the empirical findings of Luca and Petrova (2003) that credit dollarization decreases with a more flexible exchange rate regime and Arteta (2002) that floating regimes are associated with greater deposit dollarization and larger currency mismatches. However, Honig (2005a) finds that the exchange rate regime does not affect either deposit or credit dollarization, implying that exchange rate regime is not an important determinant of unofficial dollarization.

The findings for equations (1.1) and (2.1) supports that the combination of inflation targeting with a floating exchange rate and improvements in institutional quality foster the use of the local currency and discourage that of the foreign currency. Both the adoption of a de facto inflation-targeting regime (*IT*) and institutional quality (*IQ*) have sizeable and significantly negative effects on debt and asset dollarization.

According to Minimum Variance Portfolio allocations, the findings of Ize and Levy-Yeyati (2003) suggest that a policy combination of inflation targeting (to the extent it reduces inflation volatility) and floating exchange rates (to the extent it increase real exchange rate volatility) minimizes dollarization incentives by increasing real exchange rate volatility relative to price volatility. Nicolo et al. (2005) employed the adoption of a formal inflation-targeting regime as an explanatory variable in their estimation and they find that targeting inflation has statistically negative effect on dollarization.

To investigate the relationship between national quality of institutions and dollarization, Levy-Yeyati (2006) and Nicolo et al. (2003, 2005) use the institutional variables based on the measures of political and institutional development assembled by Kaufman et al. (1999), on the other hand, Honig (2005a) includes *bureaucracy quality*, *corruption* and *law and order* from International Country Risk Guide to proxy for institutional quality in his

model. They all find that improved institutional quality reduces financial dollarization.

Both equations (1.1) and (2.1) have high explanatory power, however, they may be misspecified as it does not consider the potential persistence of dollarization. In the last decade, it has been observed in Latin America and Turkey that high dollarization does persist and perhaps even rises after a clear achievement of improved fundamentals. Empirically, this persistency effect is captured by including the lagged DD and AD in equations (1.1) and (2.1), respectively. In equations (1.2) and (2.2), statistically significant coefficients of lagged DD and AD confirm the persistence of dollarization that the contrast between the picture of macroeconomic developments and the dollarization trends in Latin America and Turkey. By the inclusion of the lagged DD in the model, while adoption of a de facto inflation-targeting regime and real exchange rate appreciation have statistically significant and negative effect on debt dollarization, flexibility of exchange rate regime, institutional quality and volatility of inflation rate lost their explanatory power. Likewise, in equation (2.2) only volatility of inflation rate is statistically significant besides the lagged dependent variable (AD_{-1}). This means that economies with higher volatility of inflation rate and high previous dollarization tend to have high current dollarization.

According to Guidotti and Rodriguez (1992), the reasons for the persistence effect of dollarization can be due to the set-up costs of establishing a dollar deposit and adjusting one's business accordingly. Having paid the set up costs agents can continue to benefit from the risk-reduction that can be gained from holding a mixed portfolio of currencies and if they lack confidence for a long time, they can be slow to divest themselves even if macroeconomic fundamentals improve. Moreover, reduction of the propensity to hold foreign currency balances requires a very low inflation rate to induce individuals to regain skills in the use of the domestic currency. Additionally, Peiers and Wrase (1997) mentions that credible and successful policy reforms may not be sufficient to overcome dollarization once network

benefits from dollar usage become embedded in transactions. Moreover, in Latin America and Turkey, the persistence in borrowing in foreign currency can be explained by “original sin” that countries have no choice since investors have refused to accept paper dominated in given countries’ currency.

CHAPTER V

CONCLUSION

Many developing countries especially Latin America and Turkey appear to be “addicted to dollars” according to Reinhart et al. (2003) since a significant share of residents domestic financial contracts are denominated in foreign currency. There are many reasons why this addiction has been placed at the forefront of the policy debate. There is a widely held view among economist and policy makers that dollarization restricts the scope for independent monetary policy and makes it more complex and less effective. Moreover, high dollarization exacerbates banking system vulnerabilities due to the currency mismatches in the case of large exchange rate depreciation since dollarized financial systems are particularly subject to solvency and liquidity risk. Indeed, according to Levy-Yeyati (2006), financially dollarized economies tend to display higher inflation rates, higher propensity to suffer banking crises and slower and more volatile output growth, without significant gains in terms of domestic financial depth. These theoretical and political concerns may indicate that financial dollarization is an important phenomenon for developing countries, especially Latin America and Turkey where dollarization has progressed steadily during 1980s and 1990s and it is worth further investigation.

In many of these countries, this practice began as a rational response of economic agents to avoid unexpected inflation and the domestic currency’s rapid depreciation rate. This can be readily seen in the large increase in the share of foreign currency deposits in these countries in periods of high inflation. However, despite the local currencies being successfully stabilized and financial markets deepening, dollarization levels remained high or even increased after inflation levels declined. This evidence indicates that the analysis depends on the inflation rate and exchange rate change is not

sufficient to explain the determinants of financial dollarization due to the persistence of dollarization phenomenon. Thus, monetary policy stance and institutional structure can help to explain the patterns of dollarization in the developing countries during the last decade.

The purpose of this study is to analyse the determinants of firm-level asset and liability dollarization in ten Latin American countries (Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Mexico, Peru, Uruguay and Venezuela) and Turkey for the period 1990-2001. In order to investigate the effects of monetary policy stance (exchange rate flexibility and inflation targeting regime), institutional structure and macroeconomic indicators (volatility of inflation and real effective exchange rate change) on financial dollarization in those countries, panel data techniques are employed.

The findings of this empirical analysis provide three important results. First, the empirical results support the conventional view that dollarization is more likely to appear in countries having suffered high and volatile inflation, as a rational response to weak monetary policies and higher devaluation/depreciation might reduce the credibility of the domestic currency and cause a switch from domestic currency deposits and loans, to those denominated in foreign currency.

Second, the findings of this analysis indicate that higher the flexibility of exchange rate, lower the liability dollarization but higher the asset dollarization. The former result is consistent with the common belief that fixed exchange rate regimes are provide implicit insurance guarantee against changes in the exchange rate and reduce agents' incentives to hedge their foreign currency exposure. This means that floating exchange rate regimes would encourage agents to limit their exposure to exchange rate risk. On the other hand, the latter result indicates that the greater exchange rate flexibility enhances the attractiveness of dollar assets as agents seek to ensure themselves against currency risk.

Finally, the empirical analysis supports the hypothesis that adoption of inflation targeting regime and strengthening the institutional environment help reduce financial dollarization.

De facto dollarization is accepted as an incapable situation where has a positive effect on financial development in countries with limited currency credibility. However, growing debates on financial dollarization that imposes the constraints on monetary policy and risks to the financial system and the financial crises that took place in Asia and South America has shifted policy makers' attention towards finding ways to reverse dollarization or at least to eliminate the disadvantages. Hence any potential dedollarization strategy should increase the cost of dollar intermediation and foster the development of local currency instruments. However, such a strategy is unlikely to induce a spontaneous switch out of the dollar, unless it is accompanied by a sound monetary policy and an active regulatory policy. The empirical results of this analysis suggest that full-fledged inflation-targeting regime in which the exchange rate is allowed to fluctuate freely within the limits set by the inflation target and improving the institutions should help to reduce financial dollarization.

REFERENCES

Acemoglu, D., Johnson, S., Robinson, J. and Y. Thaicharoen (2002) Institutional Causes, Macroeconomic Symptoms: Volatility, Crises and Growth, *NBER Working Paper*, No.9124.

Agenor, P.R., and M.S. Khan (1996) Foreign Currency Deposits and the Demand for Money in Developing Countries, *Journal of Developing Economics*, 50, 792-807.

Allen, F. and D. Gale (2000) Optimal Currency Crises, *Carnegie-Rochester Conference Series on Public Policy*, 53, 177-230.

Arellano, M. (1987) Computing Robust Standard Errors for Within-groups Estimators, *Oxford Bulletin of Economics and Statistics*, 49, 431-434.

Arteta, C. (2002) Exchange Rate Regimes and Financial Dollarization: Does Flexibility Reduce Bank Currency Mismatches?, *International Financial Discussion Paper*, No.738, Board of Governors of the Federal Reserve System.

Arteta, C. (2003) Are Financially Dollarized Countries More Prone to Costly Crises?, *International Financial Discussion Paper*, No.763, Board of Governors of the Federal Reserve System.

Balino, T., Bennett A., and E. Borensztein (1999) Monetary Policy in Dollarized Economies, *IMF Occasional Paper*, No. 171.

Baltagi, B.H. (2001) *Econometric Analysis of Panel Data*, 2nd Ed., John Wiley & Sons.

Barajas, A. and A. Morales (2003) Dollarization of Liabilities: Beyond the Usual Suspects, *IMF Working Paper*, No.03/11 .

Benavente, J.M., Johnson, C.A. and F.G. Morande (2003) Debt Composition and Balance Sheet Effects of Exchange Rate Depreciation: A Firm Level Analysis for Chile, *Emerging Markets Reviews*, 4(4), 379-416.

Berg, A. and E. Borensztein (2000) Full Dollarization: The Pros and Cons, *IMF Policy Discussion Paper*, Washington DC.

Bernanke, B., M. Gertler and S. Gilchrist (1999) The Financial Accelerator in a Quantitative Business Cycle Framework, *NBER Working Paper*, No. 6455.

Broda, C. and E. Levy Yeyati (2000) Safety Nets and Endogenous Financial Dollarization, *Universidad Torcuado Di Tella*, Mimeo.

Broda, C. and E. Levy-Yeyati (2003a) Dollarization and the Lender of Last Resort, In: Levy-Yeyati, E. and F. Sturzenegger (eds.), *Dollarization: Debates and Policy Alternatives*, Cambridge: MIT Press, 101-131.

Broda, C. and E. Levy-Yeyati (2003b) Endogenous Deposit Dollarization, *Federal Reserve Bank of New York Staff Papers*, No.160.

Burnside, C., Eichenbaum, M. and S. Rebelo (2001) Hedging and Financial Fragility in Fixed Exchange Rate Regimes, *European Economic Review*, No. 45, 1151-1193.

Caballero, R. J. and A. Krishnamurthy (2003) Excessive Dollar Debt: Financial Development and Underinsurance, *The Journal of Finance*, No. 2, 867-893.

Calvo, G.A. (1978) On the Time Consistency of Optimal Policy in the Monetary Economy, *Econometrica*, 46, 1411-1428.

Calvo, G.A. (1996) Money, Exchange Rates and Output, MIT Press, Cambridge, MA.

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

Calvo, G.A. and P. Guidotti (1990) Indexation and Maturity of Government Bonds: An Exploratory Model, In: Dornbusch, R. and M. Draghi (eds.), *Capital Markets and Debt Management Cambridge University Press*, Cambridge, U.K.

Calvo, G.A. and C.M. Reinhart (2001) Reflection on Dollarization, In: Alesina, A. and R.J. Barro (eds.), *Currency Unions*, Stanford: Hoover Institution Press, 39-47.

Calvo, G.A. and C.M. Reinhart (2002) Fear of Floating, *The Quarterly Journal of Economics*, 117(2), 379-408.

Calvo, G.A., Izquierdo A. and E. Talvi (2002) Sudden Stops, The Real Exchange Rate and Fiscal Sustainability: Lessons from Argentina, *Inter-American Development Bank, Research Department, Working Paper*, No. 469.

Calvo G.A., Izquierdo A. and L.F. Mejia (2003) On the Empirics of Sudden Stops: The Relevance of Balance-Sheet Effects, *NBER Working Paper*, No. 10520.

Calvo, G.A. and F.S. Mishkin (2003) The Mirage of Exchange Rate Regimes for Emerging Market Countries, *NBER Working Papers*, No. 9808.

Catao, L. and M. Terrones (2000) Determinants of Dollarization: The Banking Side, *IMF Working Paper*, No.146.

Céspedes, L.F. (2003) Financial Frictions, Real Devaluations and Output Losses, *Mimeo*.

Céspedes, L.F., Chang, R. and A. Velasco (2001a) Dollarization of Liabilities, Financial Fragility and the Exchange Rate Policy, In: Alesina, A. and R.J. Barro (eds.), *Currency Unions*, Stanford: Hoover Institution Press, 67-75.

Céspedes, L.F., Chang, R. and A. Velasco (2001b) Dollarization of Liabilities, Net Worth Effects, and Optimal Monetary Policy, *Mimeo NBER*.

Chang, R. and A. Velasco (2001) Monetary Policy in a Dollarized Economy Where Balance Sheets Matter, *Journal of Development Economics*, 66, 445-464.

Choi, W.G. and D. Cook (2003) Liability Dollarization and the Bank Balance Sheet Channel, *Journal of International Economics*, 64, 247-275.

Delgado, F. L., Kanda, D. S., Casselle, G. M. and R.A. Morales (2002) Domestic Lending In Foreign Currency in Building Strong Banks through Surveillance and Resolution, Enoch, C., Marston, D. and M. Taylor (eds.), *International Monetary Fund*, Washington D.C., 40-61.

Domaç, I. and M.S.M. Peria (2003) Banking Crises and Exchange Rate Regimes: Is There a Link?, *Journal of International Economics*, 61(1), 41-72.

Dooley, M. (2000). A Model of Crisis in Emerging Markets, *The Economic Journal*, 110(460), 256-272.

Eichengreen, B., and R. Hausmann (1999) Exchange Rates and Financial Fragility, *NBER Working Papers*, No. 7418.

Feige, E.L. (2003) The Dynamics of Currency Substitution, Asset Substitution and De Facto Dollarization and Euroization in Transition Countries, *Macroeconomics 0302005*, Economics Working Paper Archive at WUSTL.

Fisher, I. (1933), The Debt-Deflation Theory of Great Depressions, *Econometrica*, 1(4), 337-357.

Fisher, S. (2001) Exchange Rate Regime: Is the Bipolar View Correct, *International Monetary Fund*, Mimeo.

Galiani, S., Levy Yeyati, E. and E. Schargrotsky (2003) Financial Dollarization and Debt Deflation under a Currency Board, *Emerging Markets Review*, No.4, 340-367.

Galindo, A. and L. Leiderman (2005) Living with Dollarization and the Route to Dedollarization, *Inter-American Development Bank Working Papers*, No.526.

Galindo, A., Panizza U. and F. Schiantarelli (2003) Debt Composition and Balance Sheet Effects of Currency Depreciation: A Summary of Micro Evidence, *Emerging Markets Review*, 4(4), 330–39.

Goldstein, M. (2002), Managed Floating Plus, *Policy Analyses in International Economics* 66, Institute for International Economics, Washington, D.C.

Greene, H.W. (1997) *Econometric Analysis*, Prentice-Hall Int., London.

Guidotti, P. and C. Rodriguez (1992) Dollarization in Latin America: Gresham's Law in Reverse?, *International Monetary Fund Staff Papers*, 39(3), 518-544 .

Hausmann, R., Panizza U. and E. Stein (2001) Why Do Countries Flow The Way They Float, *Journal of Development Economics*, No. 66, 387-414.

Havrylyshyn, O. and C.H. Beddies (2003) Dollarization in the Former Soviet Union: From Hysteria to Hysteresis, *Comparative Economic Studies*, 45, 329-358.

Herrera, L.O. and R. Valdés (2004) Dedollarization, Indexation and Nominalization: The Chilean Experience, *Inter-American Development Bank Economic and Social Study Series*, Mimeographed document.

Honig, A. (2004) Is There a Link between Dollarization and Banking Crises?, *Working Paper* , Colombia University.

Honig A. (2005a) Dollarization, Exchange Rate Regimes and Government Quality, Amherst College, Mimeo.

Honig A. (2005b) Fear of Floating and Domestic Liability Dollarization, Amherst College, Mimeo.

Honohan, P. and A. Shi (2003) Deposit Dollarization and the Financial Sector in Emerging Economies, In: Hanson, J., Honohan, P. and G. Majnoni (eds.), *Globalization and National Financial Systems*, Oxford University Press, New York.

Hsiao, C. (1986) *Analysis of Panel Data*, Cambridge University Press, Cambridge.

Inter-American Development Bank (2004) *Unlocking Credit: The Quest for Deep and Stable Bank Lending*, Chapter II-IV, New York.

Inter-American Development Bank (2005) *Report on Economic and Social Progress in Latin America*, Chapter 4.

International Monetary Fund (2002) *Annual Report on Exchange Arrangements and Exchange Restrictions*.

Ize, A. (2005) Financial Dollarization Equilibria: A Framework for Policy Analysis, *IMF Working Papers*, No. 186.

Ize, A. and E. Levy-Yeyati (1998) Dollarization of Financial Intermediation: Causes and Policy Implications, *IMF Working Papers*, No. 28.

Ize, A. and E. Levy-Yeyati (2003) Financial Dollarization, *Journal of International Economics*, 59, 323-347.

Ize, A. and E. Levy-Yeyati (2005) Financial De-Dollarization: Is It for Real?, *IMF Working Papers*, No. 187.

Ize, A. and E. Parrado (2002) Dollarization, Monetary Policy and the Pass-Through, *IMF Working Paper*, No.188.

Ize, A. and A. Powell (2004) Prudential Responses to De Facto Dollarization, *IMF Working Paper*, No.04/66.

Jacome, H. and I. Luis (2004) The Late 1990s Financial Crises in Ecuador: Institutional Weaknesses, Fiscal Rigidities, and Financial Dollarization at Work, *IMF Working Paper*, No. 04/12.

Jeanne, O. (2003) Why Do Emerging Markets Borrow in Foreign Currency?, *CEPR Discussion Papers*, No. 4030.

Kamil, H. (2004) A New Database On The Currency Composition And Maturity Structure Of Firms' Balance Sheets In Latin America, 1990-2002, *Inter-American Development Bank*.

Kaufmann, D., Kraay, A and M. Mastruzzi (2005) Governance Matters IV: Governance Indicators for 1996-2004, The World Bank Policy Research Working Paper, No. 3630.

Kesriyeli, M., Ozmen, E. and S. Yigit (2005) Corporate Sector Debt Composition and Exchange Rate Balance Sheet Effect in Turkey, *Central Bank of the Republic of Turkey*, Mimeo.

Krugman, P. (1999) Balance Sheets, The Transfer Problem and Financial Crises, In: Isard, P., Razin, A. and A. Rose (eds.), *International Finance and Financial Crises*, Kluwer Academic Publishing.

Kydland, F. and E. Prescott (1977) Rules Rather than Discretion: The Inconsistency of Optimal Plans, *Journal of Political Economy*, 85(3), 473-490.

Levy-Yeyati, E. and E.F. Arias (2003) Financial DeDollarization: Where Do We Stand?, Presented at the Conference on “Financial DeDollarization: Policy Options”, Unpublished (Washington: Inter American Development Bank).

Levy-Yeyati, E. (2006) Financial Dollarization: Evaluating the Consequences, Forthcoming, *Economic Policy*.

Licandro, G. and J. A. Licandro (2003) Building the Dedollarization Agenda: Lessons from the Uruguayan Case, *Central Bank of Uruguay Working Paper*, Montecideo, Unpublished.

Luca, A. and I. Petrova (2003) Credit Dollarization in Transition Economies: Is it Firms' or Banks' "Fault"?, Drexel University, Unpublished.

Maddala, G.S. (1993) *The Econometrics of Panel Data*, Edward Elgar Publishing, England.

Martínez, L. and A. Werner (2001) The Exchange Rate Regime and the Currency Composition of Corporate Debt: The Mexican Experience, *Journal of Development Economics*, 69(2) , 315-334.

McKinnon, R. (2001), The East Asian Dollar Standard, Life After Death?, In: Joseph Stiglitz and Shahid Yusuf (eds.), *Rethinking the East Asian Miracle*, World Bank and Oxford University Press.

Mishkin, F. (1996) Understanding Financial Crises: A Developing Country Perspective, in *Annual World Bank Conference on Development Economics 1996*. Bruno, M. and B. Pleskovich (eds.), Washington D.C., 29-62.

Mishkin, F. and A. Posen (1997) Inflation Targeting: Lessons from Four Countries" *Federal Reserve Bank of New York Economic Policy Review*, 9-110.

Nicolo, G., Honohan, P. and A. Ize (2003) Dollarization of the Banking System: Good or Bad, *World Bank Policy Research*, No.3116.

Nicolo, G., Honohan, P. and A. Ize (2005) Dollarization of Bank Deposits: Causes and Consequences, *Journal of Banking and Finance*, 29(7), 1697-1727.

Obstfeld, M. (1998), The Global Capital Market: Benefactor or Menace?, *Journal of Economic Perspectives*, 12, 9-30.

Oomes, N. (2003) Network Externalities and Dollarization Hysteresis: The Case of Russia, *IMF Working Paper*, No. 96.

Peiers, B. And J. M. Wrase (1997) Dollarization Hysteresis and Network Externalities: Theory and Evidence From an Informal Bolivian Credit Market, *Federal Reserve Bank of Philadelphia*, Working Papers, No. 21.

Poirson, H. (2001) How Do Countries Choose Their Exchange Rate Regimes?, *IMF Working Paper*, No.01/46.

Reinhart, C.M. and K.S. Rogoff (2004) The Modern History of Exchange Rate Arrangements: A Reinterpretation, *Quarterly Journal of Economics*, No.1, 1-48.

Reinhart, C., Rogoff, K. and M. Savastano (2003) Addicted to Dollars, *NBER Working Paper*, No.10015.

Rigobon, R. and D. Rodrik (2004) Rule of Law, Democracy, Openness, and Income: Estimating the Interrelationships, NBER Working Paper, No. 10750.

Sahay, R., and C.A. Vegh (1995) Dollarization in Transition Economies: Evidence and Policy Implications, *IMF Working Paper*, No.95/96.

Savastano, M.A. (1996) Dollarization in Latin America: Recent Evidence and Some Policy Issues, *IMF Working Paper*, No.04.

Schmidt-Hebbel, K. and A. Werner (2002) Inflation Targeting in Brazil, Chile and Mexico: Performance, Credibility on the Exchange Rate, *Central Bank of Chile Working Paper*, No.171.

Serdengeçti, S. (2005) Dollarization, *Remarks to Opening the Republic of Turkey Anotolian University, Eskisehir* (03.10.2005), www.tcmb.gov.tr, Governor's Remarks.

Singh A., Belaisch A., Collyns C., De Masi P., Krieger R., Meredith G., and R. Rennhack (2005) Chapter VI: Financial Dollarization in Latin America, *Stabilization and Reform in Latin America: A Macroeconomic Perspective on the Experience Since the Early 1990s*, IMF Occasional Paper, No. 238.

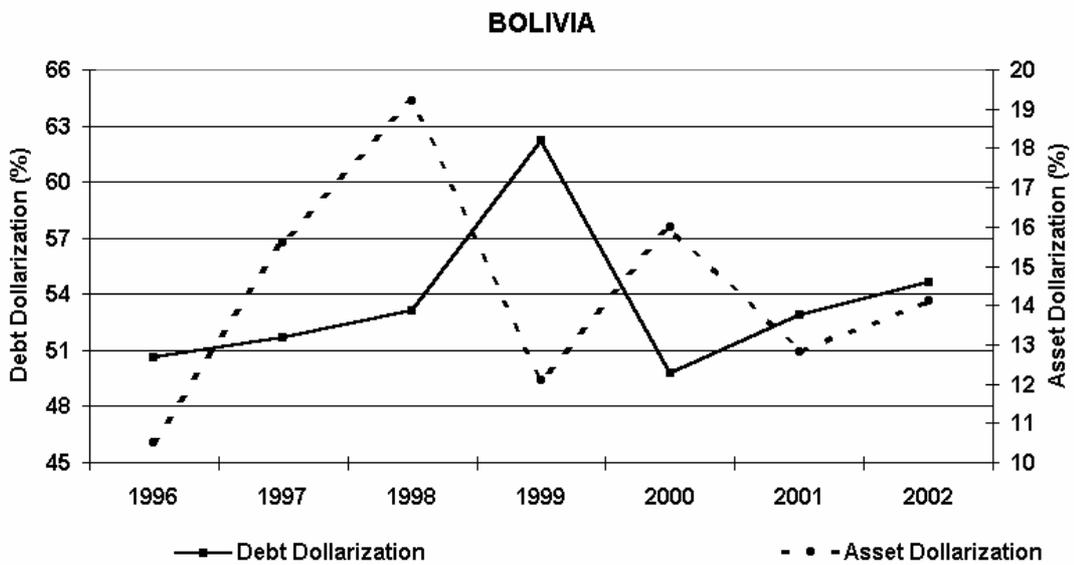
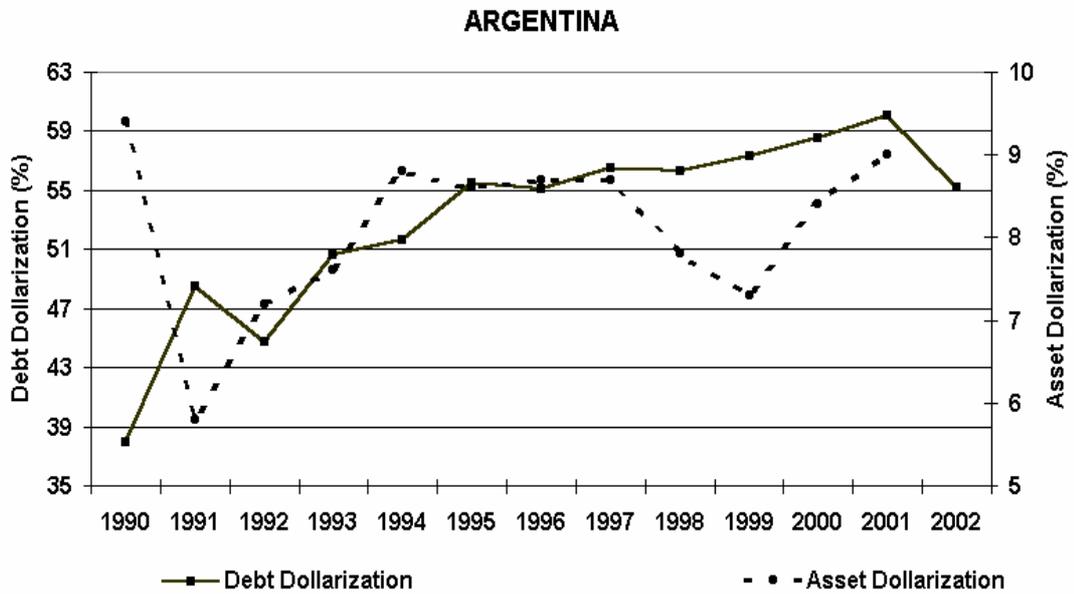
Velarde, J. (2005) Challenges of Financial Globalization and Dollarization for Monetary Policy: The Case of Peru, *BIS Papers*, No. 23.

World Economic Outlook, September 2005. Chapter IV: Does Inflation Targeting Work in Emerging Markets?, International Monetary Fund.

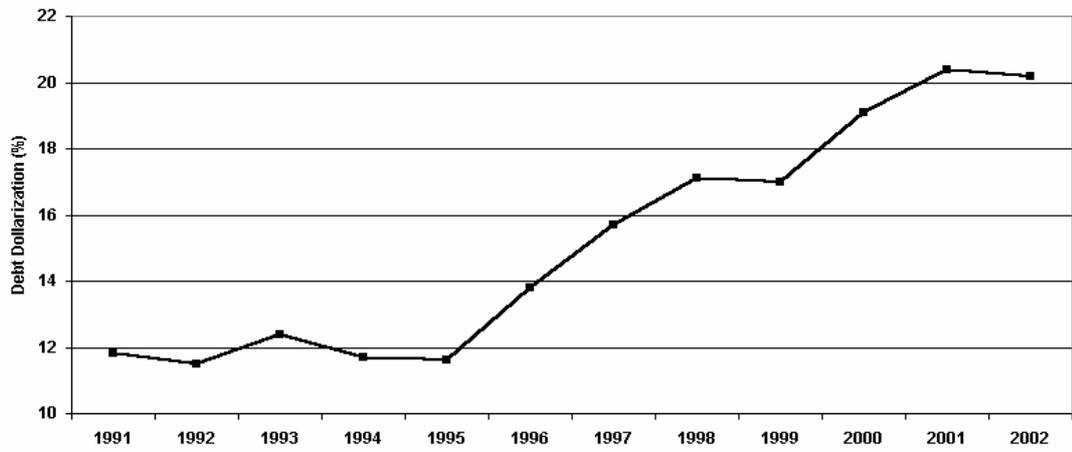
APPENDICES

APPENDIX A

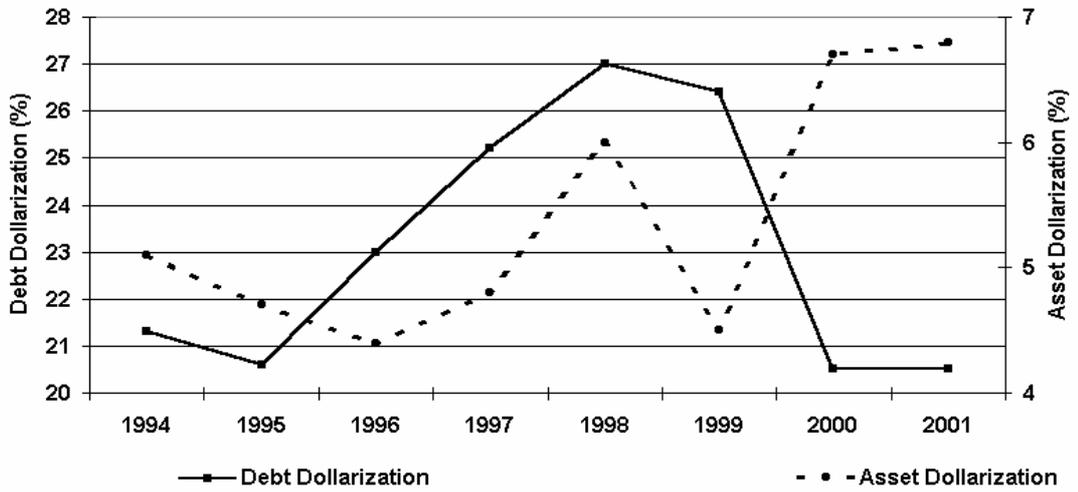
Corporate Sector Asset and Debt Dollarization in Latin America and Turkey through 1990-2002



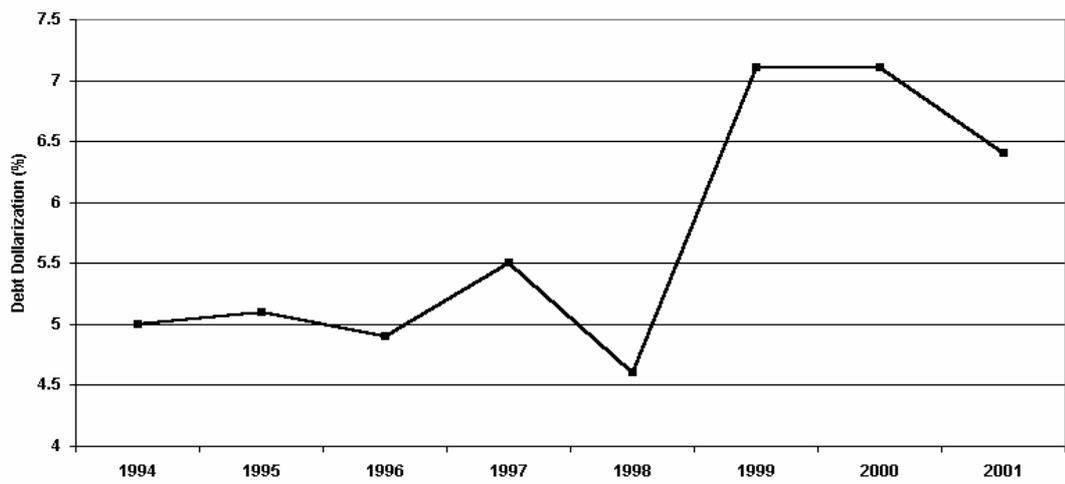
BRAZIL



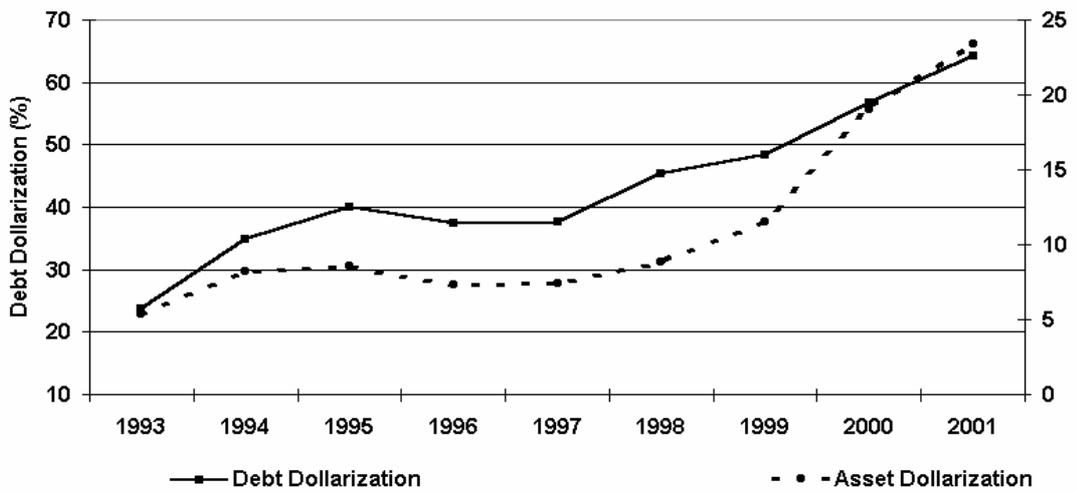
CHILE



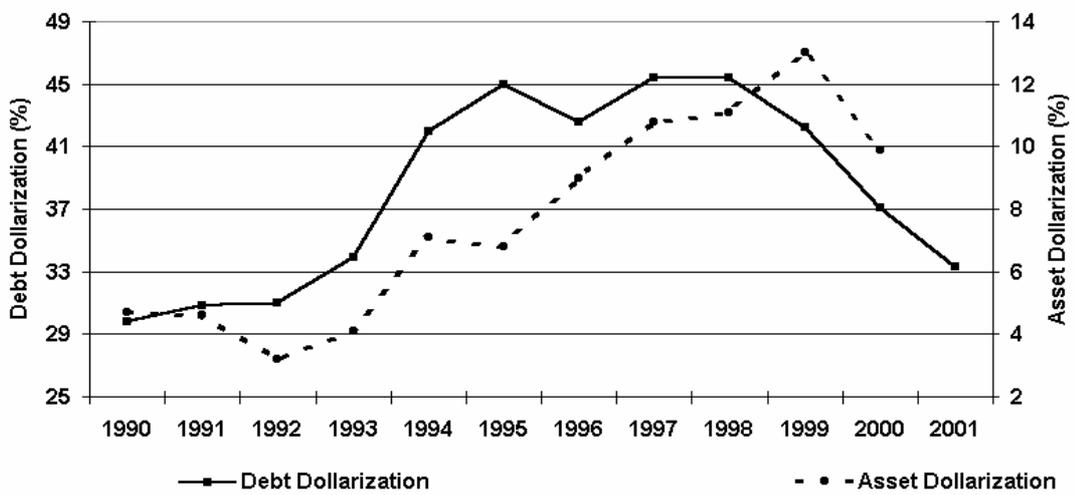
COLOMBIA



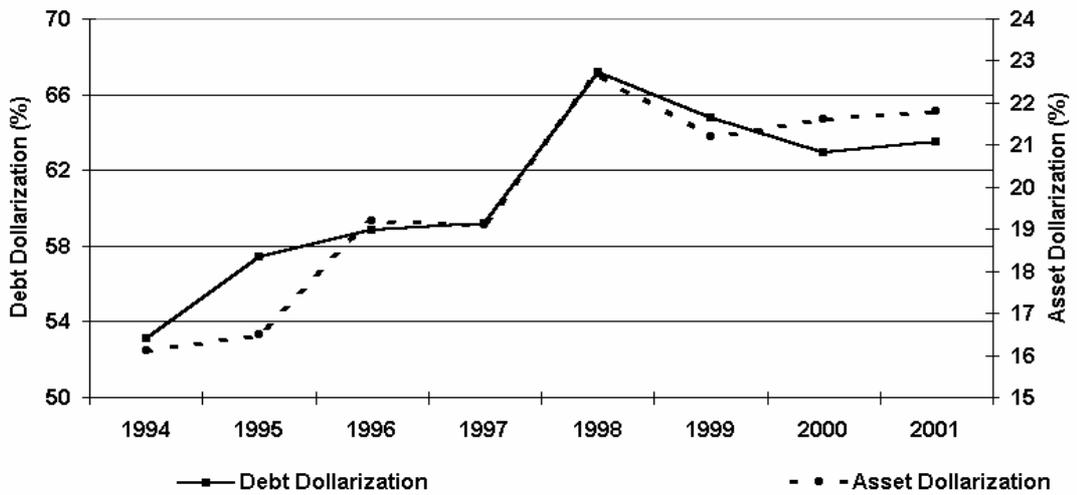
COSTA RICA



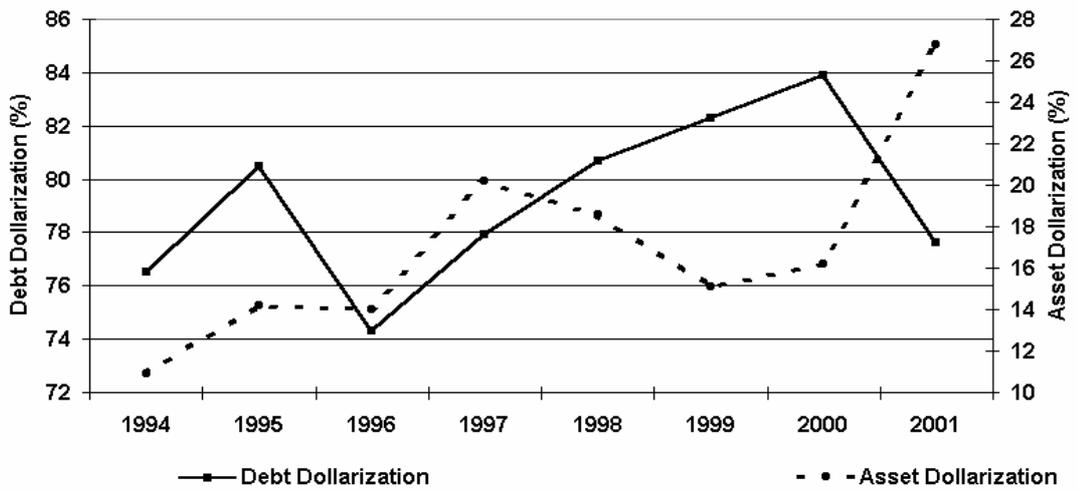
MEXICO



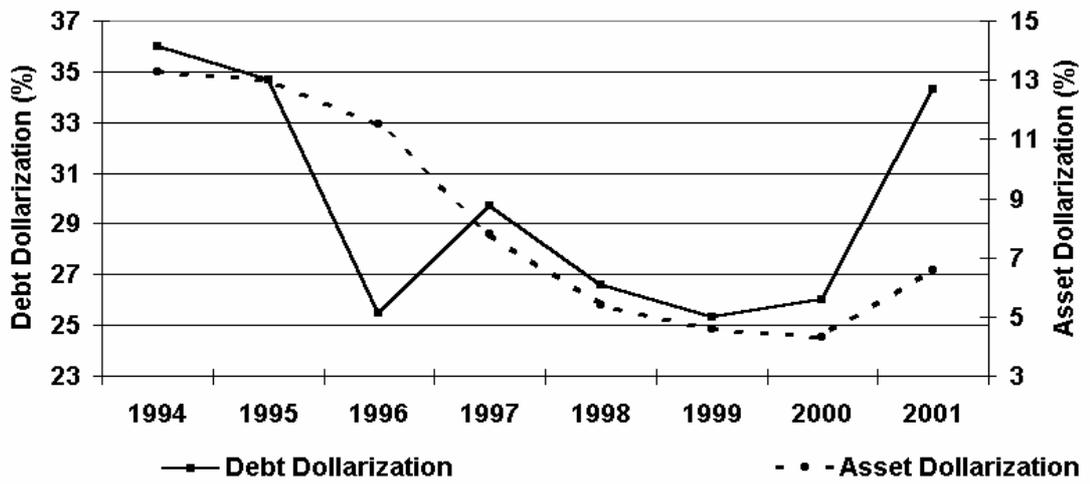
PERU



URUGUAY



VENEZUELA



TURKEY

