Financial Governance, Banking and Financial Instability in Brazil: Analysis and Policy Recommendations

Editors

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1. Introduction

Leonardo Burlamaqui, Felipe Rezende and Matheus Vianna

"The crisis consists precisely in the fact that the old is dying and the new cannot be born; in this interregnum, a great variety of morbid symptoms appear."

Antonio Gramsci.

The resilience and stability of Brazil's financial system has received attention as the country navigated relatively smoothly through the 2007-2008 global financial crisis and the collapse of both the "official" and the shadow banking system in the US and Europe. Policy-makers and regulators have pointed to the robustness of Brazil's financial system and its resilience to the global financial crisis by contrasting it with the conditions that existed in the U.S. financial system prior to the "subprime" crisis. Brazil's economy experienced a period of relative economic stability and rapid growth of domestic bank lending in the last 10 years. Nonetheless, as Hyman Minsky explained in several of his works (Minsky: 1966, 1982, 1986), a striking feature of periods before financial crises erupts is that they validate riskier practices. The outcome is that periods of growth and financial stability validates expectations and financial operations, which change the dynamics of the whole financial system leading to endogenous fragility and instability.

Minsky's analytical framework put at the forefront the destabilizing effects of stability on financial structures, which generate endemic financial crisis as a result of endogenous processes of market economies. As he famously argued, "stability is destabilizing".

Precisely because of these features, Minsky's model attributes an extremely important role for dynamic financial regulation, fiscal and monetary policies to dampen -- and deal with the consequences offinancial fragility. It becomes important to identify the - old and new sources of instability and the suitability of regulatory and financial structures to suggest policies for reforming Brazil's financial architecture to increase systemic stability as the provision of longterm funds for investment. Otherwise, the development of fragile financial structures, considered as normal characteristics of growth processes, can spread financial instability throughout the system and precipitate a financial crisis. In these situations, the failure of policy makers to behave proactively and in a countercyclical manner, as well as adapting financial regulation accordingly, tends to amplify the effects of what would otherwise have been minor recessions into major downturns and long periods of stagnation, as it happened in the US and major parts of Europe after 2007-2008.

This book is one of the outputs of a larger project on Financial Structures and Financial Governance for Innovation and Development funded by a grant[1] awarded by the Ford-Foundation/New York to the Multidisciplinary Institute for Development and Strategies (MINDS) under the direction of Rogerio Sobreira. The project covered two intertwined lines of research: a) Financial Governance, Banking and Financial Instability in Brazil: Analysis and Policy Recommendations directed by Felipe Rezende and b) Financial Governance for Innovation and Development: the cases of Brazil and China, directed by Leonardo Burlamaqui. Matheus Vianna, MINDS Executive Coordinator, collaborated and provided editorial assistance to both lines of research. The project's final report generated three books which complement each other although can be read separately. The present volume is the collective result of Rezende's directed project.

Both projects utilize Hyman P. Minsky's work. The present one puts special emphasis on the Brazil's private sector's growing financial fragility and failed policy responses, including the limits to external finance and the inadequacy of structural adjustment policies to stabilize the economy. The aim is to demonstrate the existence of endogenously generated instability in the Brazilian economy, which has created frequent and systemic financial crises.

It is grounded on Hyman P. Minsky's work to shed light on the private sector's growing financial fragility and failed policy responses, including the limits to external finance and the inadequacy of structural adjustment policies to stabilize the economy. It aims to demonstrate the existence of endogenously generated instability in the Brazilian economy, which has created frequent and systemic financial crises. To sum up, the second report attempts to show that Brazil's crisis was not primarily due to unsustainable policies; the country's problem is systemic, which in spite of an initial success to deal with the immediate consequences of the 2007-08 Global Financial Crisis, turned into a huge failure.

This book aims to discuss recent developments in the Brazilian financial structure, policy actions and financial governance under a Keynes-Minsky analytical framework. Minsky's alternative approach provides a framework to investigate structural changes in the domestic financial architecture. It allows for the appropriate dynamic design of existing regulatory and supervisory policies to constrain the development of financial fragility and deal with severe systemic crises. This is what unite the chapters which, otherwise, address fairly different topics.

The book is structured as follows. In the second chapter, Felipe Rezende discusses some issues for the creation of log-term funding in Brazil. The creation of new sources of financing and funding is at the center of discussions to promote real capital development. It has been suggested that access to capital markets and long-term investors are a possible solution to the dilemma faced by Brazil's increasing financing requirements (such as infrastructure investment and mortgage lending needs), and the limited access to long-term funding in the country. However, over the past three decades, the use of high interest rates as the single policy tool has prevented the development of a long-term finance market. This chapter aims to show that active manipulations of the benchmark Selic interest rate and liquidity risks hamper the development of a long term fixed income market. In this regard, it shows that both, the level and volatility of the short-term interest rate prevent the development of a long-term finance market.

Rezende first provides a brief overview of the current state of the Brazilian financial system, followed by an analysis about how the level and volatility of interest rates impact the cash flow structure and the balance sheet of financial institutions. From this perspective, this chapter builds on an alternative theoretical approach proposed by Rezende (2015), which extends Keynes's theory of liquidity preference and the money demand to shed light on this issue. It then analyzes how manipulations in interest rates have impacted the balance sheet and cash flow structure of financial institutions to show how expected changes in interest rates bring about changes in total expected return and on the demand for financial assets. The chapter concludes with policy recommendations to foster long term funding through the development of Brazil's capital markets.

The third chapter, by Ernani Torres and Luiz Macahyba, addresses the long term corporate finance in Brazil. The Brazilian long-term credit market was regarded as small and shallow for many decades after the World War II. Only in the 2000's, after high inflation came to a halt, and fiscal and exchange rate stability became a reality, local financial markets started to grow steady, and at high rates at the same time as the real interest rates declined, and the average maturity of the corporate debt rose. In this chapter, the Brazilian long-term corporate financial market is assessed by three different perspectives. The first is comparing its size with other relevant countries. This dimension illustrates the aspects of the local financial development as part of a global integrated system. The second is following the evolution of the long term corporate market in Brazil, and of the financial system as a whole. This will allow us to examine the recent evolution of corporate debt with the other components of the domestic credit market. The third shows light on the sources of long term funds for corporations, and on their main providers and managers.

The analysis provides a way to identify the role of different investors on the decision-making process. An overview of the bank credit market after the 2000s is included, as well as a discussion on the crucial role of BNDES in the long-term financial market in Brazil. The chapter concludes with policy recommendations focusing on the regulatory changes, which should be implemented to boost the access of households and institutional investors, and the offers that are open to all investors, the registered ones.

The fourth chapter, by Daniela Peres and Maryse Farhi, examine raising financial fragility in Brazil, particularly in regard of foreign exchange derivatives. The focus of this chapter is the relationship between the derivatives market, banking competition and financial fragility in Brazil, from 1995 to 2014. The authors show how financial innovations have spread across Latin American and Asian economies since the 1990s. In most emerging countries, financial derivatives are mostly traded in over the counter markets (OTC), while in Brazil a significant share is traded at the organized exchange, Bolsa de Mercadorias e Futuros (BM&FBovespa). Despite their differences, these markets have an important common aspect: the importance of foreign exchange rate derivatives. Since foreign exchange rates have always been at the core of all emerging countries' crisis, those derivatives have the potential to allow hedging risks, mitigating the crisis or to exacerbate its depth due to leveraged bets that turn sour.

The structure of the derivatives market in Brazil discussed in the chapter allowed the contracts to perform a dual role: hedge and speculation. They could be used to smooth the impact of financial disruption in foreign exchange transactions if a sufficient amount in positions were hedged (as in 1999), or to vastly extend the impact of a crisis in case leveraged positions prevailed on the "wrong side" of the bet, case in which heavy losses would materialize (as in 2008). Yet, another specificity of the Brazilian derivatives market has contributed to the policy response, aimed at mitigating this impact, namely, the obligation to register all derivatives operations carried out in the onshore market.

The aim here is to show how banking competition has intertwined with the factors underlying the specificity of the country FX derivatives market since the mid-1990s. The authors divide the analysis in three periods: in the first 1995-1999, regulatory reforms opened banking competition, and Brazil suffered several currency crises; in the second 1999-2008, a new macro-policy regime was implemented, and financial openness was amplified; and in the third, after mid-2008, the contagion effects of the global financial crisis disrupted cross-border financial "normality", and led to new regulatory responses.

The fifth chapter, by Rezende, looks into the questions of why Brazil needs public banks, and what is the role of BNDES. During the precrisis period, developed countries' regulatory systems had been considered as "best practices", and formed the basis for recommendations to developing countries, seeking to liberalize and expand their domestic financial markets. The crisis discredited notions that private markets, and especially financial markets, are inherently stable. Additionally, the crisis has shown the failure of private finance to efficiently allocate capital to finance real capital development. Flaws in credit allocation by deregulated private banks, and difficulties in reestablishing the supply of credit for the real sector in developed economies (despite expansionary monetary policies) have led to a renewed interest in credit policies. Rezende uses Minsky's framework to examine how BNDES acted as Minsky's "Big Bank" providing both short and long-term finance to distressed business, how it acted as lender of last resort and the supplier of liquidity and finance for development

Chapter six, by Camila Villard Durand, analyses the role of the International Monetary Fund, as the international lender of last resort for emerging countries. The primary responsibility of an international lender of last resort is to provide liquidity to cope with (or avoid) balance of payment imbalances. In the 1940s, the Bretton Woods Agreements assigned this mission to the IMF. Given that lenders of last resort play such a critical function, why the largest EMEs in Latin America and Asia did not rely on formal, institutionalised lenders of last resort to cope with the 2008 crisis? Why did they, instead, prefer to use ad hoc arrangements? The first hope in the aftermath of the crisis was that the IMF could provide a multilateral alternative to the unilateral accumulation of foreign reserves. Durand's answer was that the IMF governance reforms attempted by the G20 have largely failed, and the Fund's new lending facilities were not drawn on by the biggest EME countries in the aftermath of 2008 crisis.

The chapter points to a gap in the current research on monetary cooperation after 2008 crisis, especially on bilateral swaps. The analysis conducted reconstructs how the 2008 crisis and its aftermath was managed, from the perspective of the EMEs, and shows how the institutional nature of monetary cooperation changed in relation to the 1990s. Based on the empirical findings, a key contribution of the chapter is to identify under which conditions the largest EMEs in Latin America and Asia could be expected to establish institutionalized cooperation in the future.

The closing, seventh chapter of the book, takes the discussion on financial regulation to a more explicitly theoretical level. Jan Kregel uses "Minsky's two masters" proposition to show how the interaction between financial regulation and financial structures is complex, and inherently difficult to manage. Minsky highlighted an apparently irresoluble contradiction that made the design of an ideal regulatory system capable of providing perennial financial stability impossible. The contradiction arose from the need of financial regulation to serve two conflicting goals: a) assurance that the financing needed for the risky projects needed for capital development of the economy will be available, and b) assurance that a safe and secure payments mechanism will be provided. Those objectives, Kregel argues, are Minsky's two masters.

For example, one regulatory proposal that is constantly proposed to safeguard the payments system is to restrict the assets held by financial institutions, issuing means of payment to risk-free government securities. While such proposals serve the needs of one master, they leave the objective of financing inherently risky productive investment to private, unregulated institutions. In simple terms, stability of the payments system would be produced at the price of increased instability in the overall economic system.

So, to resolve this apparent antinomy, a regulatory proposal which does not put the two masters in conflict, some steps are necessary: we must understand the operation of the financial system and the payment system, in theory and in practice, we must understand the difference between money and credit, and we must understand the fundamental principles of both, public and private banking activities. Following Minsky, but surpassing his diagnosis, Kregel, proposes a radical shift in the way contemporary financial structure is organized. The relatively safe task of providing a reliable payment system should be left to private banks, although supervised by financial authorities and backed by deposits' insurance. In contradistinction, the much riskier task of financing development and innovation should be performed by institutions which could bear them: majorly public financial institutions, such as development banks, or by specialized investment vehicles, such as venture capital funds, where losing money is a core feature of their business model and thus not jeopardize "other people's money.

A very well know quote from Keynes, from the General Theory reads as "Practical men who believe themselves to be quite exempt from any intellectual influence, are usually the slaves of some defunct economist. Madmen in authority, who hear voices in the air, are distilling their frenzy from some academic scribbler of a few years back". Since it was written, Keynes' provocation was proven right over and over. However, today, even more dangerous than defunct economists are the ones alive and not merely prescribing completely out of touch with reality policy packages, but serving at the pleasure of powerful interests and lobbies. In a political and policy landscape like that, let us close, suggesting that the big concern turns not to the power of defunct economists, but to the type of defunct economists and academic scribers we are aligned to.

In closing, we acknowledge the financial support of the Ford Foundation , the logistical support by the Multidisciplinary Institute for Development and Strategies (MINDS). We also thank the Hobart and William Smith Colleges and Fundação Getulio Vargas (FGV/EESP) for hosting some of the project's seminars and workshops. Finally, the book would not exist without the brilliant insights and hard work by the team of researchers who have contributed to this project: Jan Kregel, Rogerio Studart, Daniela Magalhães Prates, Ernani Teixeira, Nelson Barbosa, Marcelo Nascimento, Pablo Santos, Camila Duran, Luma Ramos, and Maryse Farhi. We also thank them all.

Introduction Notes

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2. Developing Long-Term Funding in Brazil

Felipe Rezende

Introduction: Changes in Brazil's financial structure

The creation of new sources of financing and funding is at the center of discussions to promote real capital development in Brazil. It has been suggested that access to capital markets and long-term investors are a possible solution to the dilemma faced by Brazil's increasing financing requirements (such as infrastructure investment and mortgage lending needs), and the limited access to long-term funding in the country. However, over the past three decades, the use of high interest rates as the single policy tool has prevented the development of a long-term finance market. This chapter aims to show that active manipulations of the Selic interest rate and liquidity risks hamper the development of a long term fixed income market.

While the Brazilian banking literature has already highlighted the relationship between the high and volatile policy rate in Brazil, and

the low exposure of Brazilian banks to long-term assets, these studies have neglected the balance sheet and cash flow impacts of changes in interest rates. They have paid little attention to total expected and realized returns (yield plus price change) of portfolios. This chapter aims to show that hyperactive monetary policy in Brazil has discouraged private banks to extend longer term loans and purchase longer dated securities, and has created instability. In this regard, this chapter aims to demonstrate that high and volatile interest rates are the main factors driving market participants to prefer securities portfolios with short maturities due to interest rate and liquidity risks. It argues that both, the level and the volatility of shortterm interest rates prevent the development of a long-term finance market.

Brazil's excessive reliance on manipulations of the interest rate as a policy tool is well known (Kregel 1999, 2000, 2009). The fundamental shift occurred with Brazil's response to the 1980s debt crisis, followed by the Real stabilization plan, and later with the introduction of the inflation target regime. Brazil's response to the 1980s debt crisis sharply increased the size of the public debt, and "its evolution was strongly influenced by the persistence of hyperinflation... As a result of the rapid inflation, fiscal policy was not a viable policy tool, nor was money supply control... The only policy tool available to try to stem the hyperinflation was high real interest rates... High interest rates to control inflation, and impeded the full development of private long-term capital markets" (Kregel 1999: 32).

During the hyperinflation period, "with inflation causing a rapidly decline in the real value of government debt, it is difficult to convince the private sector to hold it, and the solution was found in the eventual introduction of full inflation indexing of government bills with high liquidity." (Kregel 2000: 2). High real interest rate was the policy tool used to convince investors to hold government debt. Moreover,

"when policies of market liberalization were introduced to replace the system of government directed development financing, there was no private sector market structure available to take its place. The financial system had lived the life of a rentier on the float created by the adjustment lags, in the indexing system of financial contracts. Indeed, there was no hardly long-term business financing to be done." (Kregel 1999:33).

With the introduction of the Real Plan in 1994, high interest rates continued to be used as an instrument of economic policy. "Thus, while the Real Plan was immensely successful in eliminating inflation, it had not solved the basic imbalance of the economy represented by the reliance on high interest rates, as the single policy tool. Just as high interest rates had reinforced the hyperinflationary tendencies in a fully indexed economy, high interest rates reinforced the imbalances on foreign and domestic account and produced an endogenous movement towards deflation in the economy." (Kregel 1999:34).

During the real plan, the shift in Brazil central bank's policy to adopt price stability as the overriding monetary policy goal induced changes in both, behavior and in the structure of Brazil's financial market, "the plan thus virtually instituted a permanent policy of high relative interest rates and a large interest rate differential with the rest of the world, since any attempt to reduce rates ran the risk of increasing vulnerability to foreign shocks." (Kregel 1999: 34).

Since the introduction of a flexible exchange rate regime on January 18, 2009, Brazil's economy experiences important changes. It adopted an inflation-targeting framework for monetary policy in June of 1999 and it moved from a position of a net debtor to the world to a net creditor status in 2007, reducing a major source of external

fragility. An inflation-targeting framework considers low inflation as a necessary condition to long-run economic growth, so that the central banks must take preemptive rate hikes to contain future inflationary pressures, and hit the inflation targets set by the National Monetary Council (CMN). Though the central bank has a great deal of discretion over its setting of the benchmark Selic rate target, active manipulations of the interest rate target has been used to presumably achieve price stability.

However, active manipulations of the interest rate increased the interest rate risk of financial institutions. The latter in turn reacted by using techniques to hedge against the effects of changing interest rates on the net interest margin, and on net worth. More recently, active manipulations of the interest rate, combined with the growth of money and capital markets, have also created the opportunity to speculate on the direction of interest rates. Though the conventional approach has argued that the high level of the benchmark Selic rate is the main obstacle to the development of long-term financing, it has paid little attention to total expected and realized returns -yield plus price change- of portfolios. In this regard, this chapter aims to show that both, the level and volatility of the short-term interest rate prevent the development of a long-term finance market.

This chapter is divided in three parts. It will first provide a brief overview of the current state of the Brazilian financial system, followed by an analysis about how the level and volatility of interest rates impact cash flow structure, and the balance sheet of financial institutions. From this perspective, this chapter will suggest an alternative theoretical approach proposed by Rezende (2015), which extends Keynes's theory of liquidity preference and the money demand to shed light on this issue. It will then analyze how manipulations in interest rates have impacted the balance sheet and cash flow structure of financial institutions, that is, it aims to show how expected changes in interest rates will bring about changes in total expected return and on the demand for financial assets. The final section discusses proposals to foster long term funding through the development of Brazil's capital markets.

The changing portfolio composition of Brazilian banks and challenges to increasing their exposure to long-term assets.

There are two basic approaches about banking. One is based on the presumption that banks are intermediaries between savers and investors, which provides the basis for the discredited notion of a "deposit multiplier". The second approach, adopted in this chapter and contrary to the mainstream view, is that finance is not a scarce resource. That is, finance is created simultaneously as banks take positions in assets by issuing liabilities. Deposits are created as a byproduct of bank lending. One of the key components of economic development is to allow bankers to act as the ephors of the economy to promote its capital development (Mazzucato and Wray 2015). In this regard, Brazil's economy experienced a period of relative economic stability and rapid growth of domestic bank lending in the last 10 years. During the New Millennium, bank credit has soared in Brazil. However, in spite of government initiatives to foster the development of long term financing, credit portfolios, in particular of private banks, still concentrate on short-maturities. In early 1999, the government implemented a flexible exchange rate regime, followed by the implementation of an inflation-targeting framework in July. Since 2005, the central bank target for the consumer price index (IPCA) has been set at 4.5 percent with a 2 percent band.

Figure 1: Selic rate[1] (% p.y)



Source: BCB

Active manipulation of interest rates by the central bank generated rising and volatile short-term interest rates, substantially increasing interest rate risk. In this regard, monetary policy has two basic impacts on the financial position of banks and financial institutions. It impacts the institution's net interest margin (NIM) and the institution's net worth. The first refers to bank's cash flows sensitivity (changes in net interest income) to changes in interest rates, and the latter is on the impact on the value of bank's assets and liabilities changing the net worth (immunization). Finally, it will be argued that the Brazilian approach to bank regulation and supervision, and the central role played by monetary policy, which resulted in high and volatile interest rates, shifted banks' portfolio towards short-term high-yield financial assets.





Source: BCB

As banks assets were heavily weighted by government debt, and Brazil's consistently high benchmark Selic rate, Brazil's official overnight lending rate, the full risk-adjusted return on liquid assets more than compensated the full return on less liquid assets, such as consumer and business loans. It shifted banks' portfolio composition towards high-quality short-term liquid government securities holdings. This period was characterized by large holdings of government securities on banks' balance sheets, and low exposure to traditional loan products.[2]





Source: BCB

Government securities played a major role in bank's portfolios. For instance, in 2002, more than one third of banks' assets were composed of Treasury securities.[3] This is what Minsky referred to robust finance (Minsky, 1986 p. 360). During this phase, banks' response to maximize profits was based on a model in which they allocated their portfolio towards short-term high-yielding liquid

assets[4] with a slower pace for consumer and business credit expansion. Historically, high Brazil central bank policy interest rate combined with high net interest rates margins and loan spreads, allowed banks to generate high returns by holding safe and liquid assets, such as government securities and low leveraged balance sheets compared to international peers, in spite of high operating[5] costs and loan loss provisions.[6] That is, during the new Millennium, Brazilian banks enjoyed a great situation by holding high-quality, high-yield, short-term assets. Due to Brazil's consistently high benchmark Selic rate, the risk-adjusted return on liquid assets more than offset the return on less liquid assets, such as consumer and business loans. It shifted banks' portfolio composition towards highquality short-term liquid government securities holdings and other high-yield, low-duration assets on banks' balance sheets. Moreover, corporate lending by private banks is expensive, so funding capital expenditure from private banks is not an option, and its high cost deters investment in capital assets. This period was characterized by large holdings of government securities on banks' balance sheets and low exposure to traditional loan products. This period is also characterized by extremely high loan spreads and net interest margin on their commercial lending portfolio.

Paradoxically, though a high interest policy imposed a significant barrier to economic development in Brazil, it also stimulated as a byproduct a financing profile of financial institutions that was less susceptible to financial instability[7]. That is, Brazilian banks hold government securities that are readily marketable at par or near par value for currency combined with high returns. Even though leverage plays an important role to maximize expected returns, Brazilian banks delivered high returns on equity (ROE) by using low leverage strategies, in spite of high operating and loan expenses compared to other major banking systems (Oliveira 2009, 254-259). High interest rates on government securities has discouraged risky lending to firms. As Roberto Setubal, chief executive of Itaú Unibanco, Brazil's largest private bank, pointed out "The financial crisis in Europe [had] "zero" impact on Itau, which does not hold any European sovereign debt, Mr. Setubal said. There is little need for Brazilian banks to buy overseas sovereign debt, when high interest rates are available in Brazil" (Cowley, Wisnefski and Roth, 2012). This injection of safe assets through government deficits into the balance sheets of private units, and banks in particular, has created an odd scenario. Large holdings of high-yielding and safe government securities by banks in Brazil is a double-edged sword that has on one of hand promoted financial stability, but it constrained the liquidity creation provided by private and public banks. It effectively discouraged the use of leverage and liquidity creation by banks. This dampened the liquidity of the liabilities of the household and business sectors. This is what Minsky called a robust financial sector with highly liquid assets.

Figure 4 and 4A: Total Gross Loans to total assets, Liquid Assets to total Assets, Liquid assets to short term liabilities





Source: BCB

However, the reduction in central bank's benchmark Selic rate to record lows encouraged banks to reduce government securities' holdings relative to their total assets. Private sector and public banks have sharply expanded lending to 56 percent of GDP in 2013, from 25 percent of GDP in 2003. As of August 2014, state-controlled banks were responsible for 53 percent of outstanding loans in Brazil, in while the share of local private-sector banks decreased to 32 percent as they have sharply reduced loan origination over the period after the crisis. However, when compared to international peers, Brazil shows a low ratio of credit to GDP.

Figure 5: Total credit outstanding, earmarked and non-earmarked loans, loan share (%)



Source: BCB

Much of the recent credit growth is due to the expansion in so-called earmarked loans. As of June 2014, earmarked loans which are subject to government mandates, account for 46 percent of outstanding loans, and freely allocated credit account for 54 percent of outstanding loans.[8]

Figure 6: Bank credit, percent of GDP, 2013



Source: World Bank, BCB

Figure 7: Earmarked and non-earmarked loan (yoy) growth



Source: BCB

In a declining interest rate environment, banks started working more as banks, allocating their assets towards claims on the private sector, and reduced their holdings of government securities. For instance, at Caixa Econômica Federal [CEF]– a State-owned multiple bank and the leading bank in Brazil's housing finance system– the share of its credit portfolio to total assets increased its importance relative to the treasury portfolio. Its loan portfolio increased to 57.1 percent of total assets in March 2014, from 27.7 percent in December 2008, while its treasury portfolio fell to 16.6 percent relative to total assets in March 2014, from 40.7 percent in December 2008.

Figure 8: CEF's credit portfolio and securities and derivative financial instruments portfolio as a share of total assets



Source: CEF, financial statements

This increase in credit is due to several factors, such as falling Selic rate, rising real incomes and formal employment, new bankruptcy law (World Bank, 2012). The growth of secured personal loans- including auto loans, payroll deductible loans[9] in which payments are made through deductions from workers' paychecks, thus generating relatively low-risk loans-and changes in mortgage loans, such as the fiduciary transfer of ownership of real estate property (trust deeds for collateral) reduced creditor risk, and costs associated with a borrower's default. Collateral-based lending, that is auto loans, payroll deductible loans, and real estate have increased substantially as perceived credit risk is lowered. As of July 2012, secured lending increased to 69 percent of personal loans from 46 percent in June 2004[10].


Figure 9: Secured personal loans vs. unsecured personal loans

Source: BCB

The short-termism of Brazil's financial market has been the subject of many studies[11]. It has been argued that Brazilian private banks' preference for high liquidity stems from the federal public debt profile (i.e., the existence of short-term public securities, such as floating rate securities indexed to the Selic rate, known as Letra Financeira do Tesouto [LFT]), and from the monetary authority's reliance on high interest rates as a policy tool. This allows banks and other institutions to hold safe and liquid government securities. These securities are an alternative to credit portfolios, in addition to easing the reallocation of banks portfolios at times of risk aversion. Therefore, it has been argued that private banks in Brazil still do not face the classical liquidity-versus-profitability trade-off (see, e.g., Freitas, 2009; Nakano, 2005).

In this regard, policy initiatives were implemented, aimed at the development of long-term financing to lengthen the maturity of fixed income instruments. For instance, a new tax structure with lower tax rates for longer maturities was introduced in 2004, a regressive taxation system for private pension products was implemented to lengthen the contribution period (up to two years at a rate of 35% and over ten years at a rate of 10%), in addition to a maturity extension (CMN resolution 4176). The creation of the so-called Letras Financeiras (financial bills)[12] issued by financial institutions with the purpose of extending bank's liabilities, which were not subject to reserve requirements and must have a minimum maturity of two years; tax incentives for the purchase of capital market instruments (capital expenditure and infrastructure bonds), which can be fixed-rate or inflation-linked with a minimum duration of four years (Project Bonds Law 12,431/11).

Though average maturity has lengthened over the past 10 years and credit has soared, banks' credit portfolios still concentrate on short maturities (with the exception of CEF and BNDES). That is, loans with maturity greater than 5 years represent a small share, relative to total loans outstanding among private bank institutions. For Brazil's large private bank, Itau-Unibanco, long-term loans represent 1,59% of its total loan portfolio. This is in sharp contrast with long-term loans holdings for public banks. For instance, at Federal Savings Bank (Caixa Econômica Federal), it represents 15%, and for Bank of Brazil it represents 15% of its total loan portfolio, while for the National Development Bank (BNDES) it represents 57%. Even though private banks have the ability to create long-term loans through the issuance of deposits, they have not been exposed to that segment.

Table 1: Long term credit operations greater than 5 years as a share of gross portfolio

Financial Institution	Long term credit portfolio – R\$ thousands	Share of gross portfolio -%	Cumulative distribution - %		
BNDES	168741329	56.94%	56.94%		
CEF	45484002	15.35%	72.28%		
BB	46055527	15.54%	87.82%		
BRADESCO	11213072	3.78%	91.61%		
SANTANDER	7291696	2.46%	94.07%		
BNB	3377153	1.14%	95.21%		
ITAU	4718402	1.59%	96.80%		
BRDE	1897986	0.64%	97.44%		
HSBC	1519636	0.51%	97.95%		
VOTORANTIM	5648	0.02%	97.97%		
BDMG	322266	0.11%	98.08%		
others	5687596	1.92%	100.00%		

Source: BNDES 2014

One of the main problems in the current private financial system is its failure to provide long term financing (Rezende 2015). The conventional argument is that the existence of interest rate-linked securities (e.g. one-day interbank deposit rate [DI] and Selic) hampers the development of long-term financing in the financial industry, and discourage trading in the secondary market.

Though the conventional approach has argued that the high level of the benchmark Selic rate is the main obstacle to the development of long-term financing, it has paid little attention to total expected and realized returns (yield plus price change) of portfolios. In this regard, this section aims to show that high and volatile interest rates are the main factors driving market participants to prefer securities portfolios with short maturities. It argues that both, the level and the volatility of short-term interest rates prevent the development of a long-term finance market.

Generalizing Keynes' breakeven method: duration and convexity effects

As argued elsewhere (Rezende 2015b), Keynes's theory of money demand, as presented in chapters 13 and 15 of the General Theory, presents a special case of the notion of duration applied to consoles (i.e., bonds), and this notion provides the basis for allocating wealth between money and bonds. Keynes implicitly used the concept of duration to analyze the impacts of expected changes in the interest rate on the price of perpetual bonds. That is, his task to analyze the impacts of rate changes on financial assets' total expected return. However, Rezende (2015b) restated Keynes's liquidity preference, and the speculative demand for money in terms of duration and convexity. This generalization of Keynes's breakeven condition updates the notion of liquidity preference for a broad range of financial assets and holding periods. This framework provides an alternative theoretical explanation for understanding the shorttermism in Brazil's financial market. For an illustration, we should look at a decomposition of bond portfolio holding period returns. For fixed income instruments, total returns equal the yield plus price changes. The calculation of the bond price generally has two components: the present value of coupon payments, and the present value of principal repayment at maturity:

$$PV = \sum_{t=1}^{M} \frac{CP_t}{(1+i_t)^t} + \frac{P_t}{(1+i_t)^t}$$

where it, or the yield to maturity, is the rate at which the current bond price is equal to the future stream of cash flows, that is, the internal rate of return.

Macaulay (1938) noted the difference between expected and realized yield, and the importance of an "adequate measure of 'longness'" to investigate the relationship between short- and long-term interest rates. He called this measure "duration" (Macaulay 1938, 44). Macaulay's duration is the weighted average of the number of years needed to obtain the present value of the cash flows from a given security. It can be calculated as follows (Macaulay 1938, 48):

$$\sum_{n=1}^{T} \frac{tOF}{P} = \frac{\frac{1C}{(1+y)^{n}}}{P} = \frac{\frac{1C}{(1+y)^{1}} + \frac{2C}{(1+y)^{2}} + \dots + \frac{nC}{(1+y)^{n}} + \frac{nM}{(1+y)^{n}}}{P}$$

where P equals:

$$P = \sum_{t=1}^{M} \frac{CP_{t}}{(1 + i_{t})^{t}} + \frac{P_{t}}{(1 + i_{t})^{t}}$$

The concept of duration measures the price sensitivity of an option free security to given changes in yields, and it is a linear approximation to small changes in yield. However, the bigger the change in yields, the bigger the effects of non-linear price changes. Convexity can be used to capture second-order effects of interest rate risk. Thus, the change in the security's market value using both, duration and convexity, can be approximated for the delta change in yields (y) as follows:[13]

$$\frac{\Delta P}{P} = -duration \times \Delta y + 0.5 \times P \times convexity \times (\Delta y)^2$$

So the new security's price is

$$\begin{split} P_{new} = & (P + (P \times -duration \times \Delta y)) + (0.5 \times P \times convexity \\ & \times (\Delta y)^2 \end{split}$$

Because investors are primarily concerned with holding period returns (HPR)— that is, income plus changes in market value— it becomes important to understand how changes in expected interest rates influence market participants' portfolio allocation. The decomposition of a bond's total expected return sheds light on the impact of policy rate changes on the HPR, in which interest rate expectations and the volatility of long-term rates determine the required bond risk premium, and short-term rates (Rezende 2015b). According to Rezende (2015b), the bigger the expected change in the interest rate for a given financial asset, the bigger the required bond risk premium to compensate for expected capital losses on bonds.

$E(Rn - y1) \approx n - 1fn - y1 + (1 + n - 1fn) * [-moddurn - 1 * E(\Delta yn - 1) + \frac{1}{2}$ $* convexityn - 1 * E(yn - 1)^{2}$

where equals the one-period forward rate and is the short-term interest rate. If one focuses exclusively on yield, then there is a risk of overlooking the potential sources of an option-free government bond's total return, which is given by the horizon return in the case of an unchanged yield curve (carry and rolldown returns), plus changes in the yield curve (approximated by duration and convexity). If the security's duration equals the investment horizon, this bond immunization strategy minimizes the interest rate risk, as it is equivalent to a zero-coupon bond held until maturity. Investors can adjust their portfolio durations relative to their horizons to hedge (or take more of) the interest rate risk. If an investor expects interest rates to fall (increase), then by extending the portfolio's duration beyond the investment horizon, it experiences net gains (losses). Even if two securities have the same duration, they might have different convexities. Moreover, the higher the interest rate volatility, the bigger the required bond risk premium to induce investors to hold securities with a longer duration.

Thus, the "greater the bond's duration, the bigger the negative impact on the bond total expected return, and the greater the required bond risk premium to provide a cushion against changes in the n-year spot rate" (Rezende 2015b, 23). That is, given investor expectations about future interest rate changes over the holding period, the bond risk premium has to be sufficient to provide an insurance cushion against potential losses in positions with a long duration. Implied forward rates represent breakeven rates, and contain expectations about future spot rates, however, this does not imply that they are good predictors (unbiased) of future spot rates, as forward rates (and futures prices) adjust periodically to reflect the changes in investor expectations about future rates. At the same time, those expectations are likely to affect current decisions. We can thus analyze rebalancing effects by looking at implied forward rates and the corresponding changes in the demand for financial assets.

Because expectations shift to adjust to new information and market events, this bond risk premium (BRP) continuously changes. For instance, a recent study by the Brazilian Central Bank (2014) found empirical support for the LPH [liquidity preference hypothesis] working with Brazilian interest rate data with both, traditional and survey methods. Our analysis with survey information strongly supports the idea that term premia monotonically increase with time to maturity. The term premium increases between two and four basis points for each additional month of maturity... The survey approach used in this paper may be used to evaluate the market sentiment regarding future steps in momentary policy. It also may be used to estimate the premium required by the market on Treasury bonds and bill auctions. (Ornelas and Silva Jr, 2014: 21).

Empirical evidence supports the notion of a time-varying risk premium, [14] —that is, as already anticipated by Keynes, Kahn, and Robinson, there is no reason to believe that forward rates are good predictors of future spot rates. Instead, longer-term interest rates reflect the expectations of future spot interest rates and the risk associated with longer bond positions (the bond risk premium [BRP]). This has been confirmed in central bank studies that suggest that the volatility of interest rates affects the BRP (Andrade and Tabak 2003), and other studies suggest that "the term premium is correlated to [the] interest rate" (Guillen and Tabak 2009). Costa, Nespoli, and Robitaille (2007) documented the existence of time-varying term premiums, and found that "futures-based forecasts systematically over-predict future policy rates" (p. 2) - that is, as current forward rates overestimate future interest rate increases, one can buy longerdated securities to take advantage of the term premium. As they noted, "a rise in hedging demand increases the term premium. But the entry from abroad of investors that are net supplies [sic] of the interest rate hedge puts downward pressure on the term premium component, all else equal." (Costa, Nespoli, and Robitaille, 2007, 13).

Recent evolution in the Brazilian domestic federal debt market

The main federal domestic debt instruments are floating-rate bills (LFT), fixed-rate bills (Letras do Tesouro Nacional [LTN] – a zerocoupon fixed-rate security), and coupon-bearing fixed-rate securities (Notas do Tesouro Nacional série-F [NTN-F], and inflation-linked bonds (Notas do Tesouro Nacional série-B [NTN-B]).

 Table 2: Domestic federal public debt

Security	Туре	Type of coupon	Maturity	Maturity	Frequency of auctions
Letras do Tesouro Nacional (LTN)	Fixed rate	Fixed rate zero coupon	Short and Medium- Term Up to 4 years (4 vertices)	Various	Weekly
Notas do Tesouro Nacional Série F (NTN-F)	Fixed rate	Fixed rate with coupon paid semiannually	Long Term 6 and 10 years (2 vertices)	January/ 2021 January/2025	Biweekly
Letras Financeiras do Tesouro (LFT)	Floating- rate	Par value indexed to Selic rate	6 years (1 vertex)	March/2021 September/20 21	Monthly
Notas do Tesouro Nacional Série B (NTN-B)	Inflation- Linked	Coupon and par value indexed to CPI (Índice Nacional de Preços ao Consumidor Amplo- IPCA)	Group I – Short and Medium Term 5 and 10 years (2 vertices)	May/2019 May/2023	Biweekly
Notas do Tesouro Nacional Série B (NTN-B)	(IPCA)	with coupon paid semiannually	Group II – Long Term 20 and 40 years (2 vertices)	May/2035 May/2055	Biweekly

Source: National Treasury 2015

During the implementation of the Real plan, a majority of Brazilian public debt was indexed to the U.S. dollar and to the overnight domestic interest rate (Kregel 1999: 35).[15] Brazil's fixed-income market was characterized by the short maturity of outstanding securities, such as LFTs. This should not be a surprise, because in an environment in which interest rates are high and volatile, market participants increase their holdings of shorter-term instruments and securities with a higher coupon or higher-yield, and LFTs tend to have shorter duration relative to securities with same maturity, but a lower-yield or a fixed rate. To reiterate fixed income, instruments provide two potential sources of return— yield and price changes— so the purchase of instruments with a higher yield increase the income component, which helps to offset the price change when interest rates are rising.[16] This scenario of high and volatile interest rates

influences investors to prefer a portfolio focused on securities with shorter duration.[17]

Figure 10: Average maturity (in months) of federal domestic public debt



Source: National Treasury

Figure 11: Fixed rate securities maturity breakdown



Source: National Treasury





Source: National Treasury

For instance, as of March 2003 the average maturity for LFTs was 20.68 months, while the average maturity for fixed-rate securities was 1.59 months! Between December 1999 and December 2003, the average maturity for fixed-rate securities remained less than eight months. That is, the purchase of LFTs reflected bondholders' desire to have limited exposure to interest rate risk[18]. The high and volatile interest rate environment that the Brazilian economy has experienced over the past three decades has left fixed-rate securities, such as LTNs, and longer-term securities such as NTN-Fs, at a disadvantage when compared to short term floating rate securities (such as LFTs). Because investors expect greater rate volatility and rising yields, they tend to weight their portfolios with short-term investments. Moreover, interest rate volatility spikes during times of economic stress change investors' attitude toward risk (Rezende 2015b). Investors can insulate their fixed-income portfolio in a period of rising interest rates and volatility, by shortening the portfolio duration relative to their investment horizon (Rezende 2015b). Money managers reduced the portfolio duration to minimize the risk of capital losses caused by active manipulations of the benchmark Selic rate. In this regard, LFTs provide protection against interest rate risk, the possibility of highincome returns, and liquidity.[19]

Because hyperactive changes in the benchmark Selic rate generates risk of capital losses, the higher the concentration of LFTs in a bank asset portfolio, the lower will be the price sensitivity of its interestyielding assets to interest rate changes (reducing its duration gap). That is, because the share of a bank's portfolio invested in shortduration assets, such as LFTs, are not exposed to interest rate risk, price volatility in the bank assets is reduced. In addition, shortduration floating-rate securities (e.g., LFTs) also play an important role in investors' risk management, because the mark-to-market value of the security pledged as collateral tends to have lower volatility. Though market participants shifted to short-term securities, the costs of forfeiting higher yields were minimized, as the monetary authority set abnormally high Selic rate targets. Thus, this concentration on short-term financial assets should be seen as a strategy designed to offset interest rate effects on the asset side of financial institutions' balance sheets.

As of February 2005, 61 percent of outstanding federal government debt was due to floating-rate securities, and 20 percent to fixed-rate securities. Floating-rate securities indexed to the benchmark Selic rate represented the lion's share of total marketable debt in Brazil—that is, in a highly volatile interest rate environment, both the public and the banks tried to avoid capital losses by shortening the duration of their portfolios by holding high-yield liquid assets. This increased concentration in the shorter end of the yield curve.



Figure 13 and 13A: Composition of marketable public debt



Source: National Treasury

Increasing duration exposure and lower volatility

Because Brazil benefited from extremely favorable conditions before the Great Recession, as well as greater financial stability, which led to exchange rate appreciation and rising asset prices (Kregel 2009) both, the benchmark Selic rate and rate volatility declined to historic lows. This resulted in an increasing share of fixed-rate securities (both LTN and NTN-F)[20] as market participants were willing to hold longer-term assets in their own portfolios to improve returns. Increased demand for fixed-rate government debt was accommodated by the federal government initiative to reduce floating-rate debt as a share of total outstanding debt (see Ministry of Finance, 2006).[21]





During this period, the Treasury's plan to take floating-rate and dollarindexed securities out of the market, significantly changed the composition of public sector debt. In 2002, floating-rate and dollarindexed securities represented 88 percent of total federal domestic marketable debt, while 1.5 percent of the Brazilian government's marketable debt[22] was at fixed rates.[23]

As of May 2015, fixed-rate and inflation-indexed securities comprised 75 percent of total federal marketable debt, compared with 10 percent in December 2002, and the proportion of Brazilian debt indexed to floating rates decreased from 42.4 % in March 2002 to 19 % in March 2015.

Source: National Treasury

R\$ billion	Dec-02	Dec-03	Dec-04	Dec-05	Dec-06	Dec-07	Dec-11	Dec-12	Dec-13	Dec-14	May-15
Stock of FPD (R\$ bn)	893	966	1,014	1,157	1,237	1,334	1,866	2,008	2,123	2,296	2,496
By Index (%)											
Fixed Rate	2	10	16	24	32	35	37	40	42	42	42
Inflation Linked	9	10	12	13	20	24	28	34	35	35	33
Floating Rate	42	47	46	44	33	31	30	22	19	19	20
Foreign Exchange Rate	46	32	24	18	13	8	4	4	4	5	5
Federal Public Debt Maturity Structure											
% Maturing in 12 months	35	31	39	36	32	28	22	24	25	24	21
Av. Maturity (years)	3.6	3.3	2.9	2.8	3.0	3.3	3.6	4.0	4.2	4.4	4.7
Av. Life (years)				4.6	4.9	5.3	5.5	5.7	6.4	6.6	6.8

Table 3: Federal Public Debt composition

Source: National Treasury

At the same time, the Treasury's policy of lengthening the average maturity of its debt increased the average maturity of the R\$2.4 trillion in outstanding federal public debt to 4.6 years in 2015, from 2.8 years as of December 2005.[24] In mid-2003, Brazil's central bank initiated a major monetary easing cycle,[25] in which its benchmark Selic rate was reduced by 1050 basis points from 26.5 percent in June 2003, but this cycle was interrupted in September 2004, when the central bank initiated a series of rate hikes that would continue until July 2005. The next monetary easing cycle took place from September 2005 until September 2007, in which the Selic rate was reduced by 850 basis points, to 11.25 percent. Between January and July 2009, the monetary authority reduced its target rate by 500 basis points and then, in an easing cycle from September 2011 to October 2012, the Selic rate target was reduced by 525 basis points, to 7.25 %, the lowest level in a decade.

Table 4: BCB's tightening cycles

Source: BCB

These declining rates encouraged investors to purchase fixed-rate securities—an increase in demand that was facilitated by the willingness of the federal government to improve the maturity structure of public debt and reduce interest rate indexing, which resulted in the replacement of floating-rate notes with fixed-rate securities. Moreover, declining Selic rates and lower volatility increased total returns on longer-term securities, outpacing those for shorter-term assets.



Figure 15: Yield curve for fixed rate government securities

Source: National Treasury 2012

Investor demand for longer-term securities increased for all instruments: securities that were fixed rate, inflation indexed, and floating rate. Their demand for these products reflected an increased tolerance for risk, and the Treasury's willingness to issue securities that would satisfy that demand.

Pension funds and insurance companies tend to adopt liability-driven investment strategies, such as a duration matching strategy, buying long-term government securities and inflation-linked bonds (see CGFS, 2011). They tend to be buy-and-hold investors, which helped increase demand for bonds with the longest duration that were linked to inflation (NTN-F and NTN-B).[26] Financial institutions also helped push demand for fixed-rate securities (LTN and NTN-F). For instance, the duration of the Anbima IRF-M 1+ Index of fixed-rate government securities with maturities equal to or more than one year increased substantially until 2008.

Figure 16: Average maturity of federal government securities traded in the secondary market



Source: National Treasury

Figure 17: Average maturity (in years) of new issuances of federal domestic public debt



Source: National Treasury

Figure 18 and 18A: IRF-M 1+ duration, monetary cycles, and portfolio market value



Source: Anbima

Because prices for long-term bonds move inversely with yields, the declining interest rates increased the attraction of longer-term bonds,

which managers snapped up to boost the total returns of their securities portfolios.



Figure 19 and 19A: Holders of government securities by type and maturity (as of May 2015)

Source: National Treasury





Source: National Treasury

The average maturity of federal public debt sharply increased, from 2.8 years in 2002 to 4.2 years in 2013. Moreover, the average maturity of fixed-rate securities increased, from 0.3 year in 2002 to 1.8 years in 2013[27].

Figure 21 and 21A: Federal public debt average maturity and average life (in years)



Source: National Treasury

Government's policy to increase the net issuance towards the long end of the yield curve, combined with market participants' increased holdings of longer-term assets, such as longer-term fixed-rate securities, exposed them to greater interest rate risk. An important financial innovation in Brazil's treasury market was the creation of zero coupon bonds by striping (STRIPS). The treasury issued National Treasury Notes - F series (NTN-F) with the possibility to separate the interest payment coupons from the underlying security, so that the stripped security became fixed-rate zero coupon bonds, thus equivalent to LTNs, thus helping eliminate reinvestment risk. Figure 22: Brazil's yield curve. Domestic (LTN and NTN-F) and Offshore (BRL) fixed rate bonds -Outstanding and Yields (as of 11/07/2014)



Note 1: Currently, only the NTN-F Jan/21 and Jan/25 are issued. Note 2: The yeld of the NTN-F is based on the 252-d standard while the yeld of the BRL is based on the 360-d standard.

Source: Bloomberg, Ambima

Figure 23: Inflation linked bonds (NTN-B as of 05/18/15)



Source: National Treasury 2015

Figure 24: DFPD Profile Held by The Public and Average maturity (% of total and BRL billion)



Source: National Treasury

Because the benchmark Selic rate declined over the past 10 years, yields on floating-rate notes were consistently below those of fixed-rate (LTN and NTN-F) securities. Thus, investors were compensated less for the interest component, as the coupon reflected the current Selic interest rate, and market value remained relatively stable, so hedging interest rate risk and lower income significantly reduced investors' total returns if they held floating-rate notes.

Figure 25: Federal domestic public debt average cost (12-month rolling average %)



Source: National Treasury

Moreover, a sharp decline in volatility reduced the BRP, so declining interest rates and volatility encouraged market participants to search for returns at the longer end of the yield curve.

Figure 26: Interest rate volatility (30-day Swap rate for the last day of the month) and fixed rate securities maturity profile



Source: Ministry of Finance

The policy to reduce dollar-indexed securities and the increasing amount outstanding of fixed-rate securities— in particular, the LTN, from R\$ 91 billion in December 2003 to R\$ 732 billion in May 2015, and the NTN-F, from R\$ 430 million in December 2003 to R\$ 301 billion in May 2015—indicates that those risks were initially shifted to market participants. For instance, a measure often used to calculate the value of a one-basis-point change in the yield, referred as a delta or DV01, shows that there was a significant increase in exposure to longer-term securities.[28]

Figure 27: Government's security price sensitivity (R\$ million)



Source: Ministry of Finance, 2006, 37

Although DV01 increased substantially, as market participants increased holdings of longer-term securities, so their security positions were more sensitive to interest rates, the value at risk (VaR) of the portfolio over time did not move in tandem. One reason for this difference was that even though exposure to yield changes in the underlying security increased, this risk was contained by the low realized volatility, thus mitigating the overall risk of longer-term fixedincome securities (see Ministry of Finance, 2006, 37). Because price fluctuations trigger the recalculation of the mark-to-market portfolio's total exposure to risk factors, when rates are low the stability of the interest rate yield curve in real time reduces the net portfolio exposure to risk factors. This, in turn, affects the price of the securities traded and pledged as collateral. Because financial institutions operate with short investment horizons, and are volatility constrained, [29] a low-volatility environment lowers their risk perception and thus encourages longer durations. Moreover, investors can use a hedge instrument, such as DI futures, to match their DV01 from the underlying security.

Estimates of realized interest rate volatility show a considerable drop, from mid-2004 until 2007, a period accompanied by increased investor willingness to take on risk. The increasing reliance on risk management techniques poses additional problems. One of the key inputs in risk management models is related to the distribution of asset returns and volatilities (BCBS 2013). If risk managers determine the portfolio risk exposure, using a given probability distribution, or based on the historical distribution of assets returns, then this approach is subject to fallibility and creates a Soros type positive reflexivity. This effect is augmented, in particular, when volatilities and correlations are estimated giving greater weight to recent information.

The global financial crisis of 2007-2008 and its aftermath deeply affected global and local market conditions, causing a sharp increase in rate volatility, which is one of the key inputs in VaR risk management models at financial institutions.[30] This sharp increase from 2008 to 2009 led to greater demand for longer-term securities, which by this point were in short supply, as investors had shifted their portfolios in favor of short-term securities.

Figure 28: 10-year Fixed-rate bonds (NTN-F 2017- R\$)



Source: National Treasury, 2009

During the period of large price swings, demand for long-term bonds was consistently below the supply, that is, bid-to-cover ratios were less than one. Throughout this period of rising volatility and sharp price swings, the government held several bond auctions that failed. In this environment of renewed higher volatility, market participants became less willing to hold positions in risky financial assets at given yields, and shifted demand to lower-term instruments. However, on the secondary market, trading activity for short-term securities was substantially lower than it was for longer-term fixed-rate securities, because the former had lower price volatility, thus reducing the secondary market's potential trading gains.

Note that the trading volume of floating rate securities relative to total trading has sharply decreased from 80 percent, of total trading in December 2002, to 14 percent in May 2015, indicating that market participants tend to buy and hold floating rate securities, as they

function as the reserve base asset in their portfolios and as a key source of liquid and stable collateral.

Table 5: Secondary market liquidity for Brazilian domestic federal government debt,

												R\$ billion
	LFT	/LFT-A/L	.FT-B	L	TN / NTN	I-F	NT	N-B/NT	N-C		Total	
					%			-%				
		% Total			Total			Total			% Total	
Date	Volume	trading	MoM %	Volume	trading	MoM %	Volume	trading	MoM %	Volume	trading	MoM%
Dec-00	2,38	35%	-10%	3,25	48%	21%	0,06	1%	-6%	6,79	100%	9%
Dec-01	2,94	32%	74%	3,77	41%	-4%	0,12	1%	85%	9,32	100%	28%
Dec-02	5,46	80%	13%	0,18	3%	-24%	0,62	9%	4%	6,81	100%	12%
Dec-03	7,05	66%	2%	2,68	25%	-5%	0,52	5%	101%	10,70	100%	4%
Dec-04	5,93	43%	4%	7,12	52%	22%	0,31	2%	-6%	13,67	100%	12%
Dec-05	4,77	37%	-9%	6,97	54%	-13%	1,22	9%	181%	13,00	100%	-5%
Dec-06	4,38	27%	6%	9,68	61%	57%	1,90	12%	9%	15,96	100%	32%
Dec-07	4,39	30%	55%	8,67	59%	48%	1,62	11%	9%	14,70	100%	44%
Dec-08	3,89	29%	68%	8,28	62%	77%	1,14	9%	38%	13,31	100%	70%
D ec-09	4,24	31%	69%	7,11	53%	3%	2,15	16%	53%	13,51	100%	25%
Dec-10	4,83	31%	57%	8,83	56%	20%	2,17	14%	-25%	15,83	100%	19%
Dec-11	4,55	27%	1%	9,28	56%	17%	2,77	17%	-34%	16,60	100%	-1%
Dec-12	3,57	14%	50%	13,27	52%	71%	8,57	34%	79%	25,41	100%	70%
Dec-13	2,43	8%	1%	14,36	48%	75%	12,97	44%	151%	29,76	100%	89%
Dec-14	2,66	16%	20%	10,81	63%	44%	3,59	21%	10%	17,09	100%	31%
Jan -15	3,47	19%	31%	10,85	59%	0%	3,97	22%	10%	18,28	100%	7%
Feb-15	3,05	17%	-12%	9,93	55%	-8%	5,15	28%	30%	18,16	100%	-1%
Mar-15	6,42	23%	111%	15,29	55%	54%	6,14	22%	19%	27,98	100%	54%
Apr-15	4,07	19%	-37%	12,12	57%	-21%	4,90	23%	-20%	21,09	100%	-25%
May-15	3,05	14%	-25%	12,41	56%	2%	6,51	29%	33%	22,29	100%	6%

Source: Ministry of Finance, 2015

However, fixed-rate securities which provide greater potential for gains in secondary market trading, are the most traded in secondary markets, as they have longer duration they tend to attract speculative investors searching for yield (Amante et al, 2007, 78).

The (short) experience of Brazil's central bank with forward guidance

Exposure to duration risk is a mixed blessing, though fixed income portfolios with longer durations provide higher returns in a declining rate environment, they tend to be accompanied by greater volatility.

	Duration (years)	Capital Gain or Loss (duration x 1 bp increase)	Yield	Total Return
Bond A	1	-1%	7%	6%
Bond B	2	-2%	8%	6%
Bond C	5	-5%	9%	4%
Bond D	7	-7%	10%	3%
Bond E	10	-10%	11%	1%
Bond F	15	-15%	12%	-3%

Table 6: Duration exposure and total returns

Lower realized interest rate volatility, and low risk perception encouraged investors to increase their portfolio's exposure to interest rate risk by shifting the mix towards longer duration bonds. Since the onset of the global financial crisis, interest rate volatility sharply increased albeit, not at the levels experienced during the early 2000s. However, rate hikes were more influenced by domestic factors, as inflation started to deviate from its target in 2008, rather than crisis contagion. However, the deterioration of global and domestic conditions forced the late response by the central bank, which cut rates as late[31] as January 2009.

Figure 29: Interest rate volatility and monetary tightening cycles



Source: BCB

In August 2011 the central bank initiated another monetary easing cycle that ended in October 2012, reducing rates by 525 basis points. The announcement of the new target for the benchmark Selic rate at 7.25 percent, an all-time low, was followed by the Monetary Policy Committee (Copom), signal that it would keep the Selic rate low for a "sufficiently long period of time". This announcement had an immediate impact on the short and long end of the yield curve as swap rates declined, generating an upward sloping yield curve.

Figure 30: Pre-DI Swap yield curve (%)



Source: BMF&Bovespa

Brazil's monetary policy committee's position, in its October statement, was reinforced in subsequent statements (November and January 2013) that the Selic rate would remain low and stable for a "sufficiently prolonged period". Note that this announcement was equivalent to forward guidance. As Keynes (1936) noted, "a monetary policy which strikes public opinion as being experimental in character, or easily liable to change, may fail in its objective of greatly reducing the long-term rate of interest, because M2 may tend to increase almost without limit, in response to a reduction of the r below a certain figure. The same policy, on the other hand, may prove easily successful, if it appeals to public opinion as being reasonable and practicable, and in the public interest, rooted in strong conviction, and promoted by an authority unlikely to be superseded...the rate of interest is a highly conventional, rather than a highly psychological,
phenomenon. For its actual value is largely governed by the prevailing view as to what its value is expected to be. Any level of interest which is accepted with sufficient conviction as likely to be durable, will be durable". (Keynes 1936: 203).

Market participants perceived this announcement from the central bank as a strong signal that the benchmark Selic rate would remain stable for the next 12 months, and created the expectation that volatility in the bond market would remain low. This market guidance provided by the monetary authority created a new interest rate structure, in which the perceived low-rate environment created a great opportunity to ride the yield curve by purchasing intermediate to longer duration government securities. However, the potential return advantage of a successful rolldown strategy requires that realized future rates are lower than that implied by current forward rates.

This reduction in the perceived rate risk level can be illustrated in figure 31, which shows that since 2008 investors increased their exposure to longer duration fixed-rate securities. DV01 hit a new high in December 2012, surpassing a level it last reached in 2007 at the height of the US housing bubble.

Figure 31: DV01 of the total fixed rate public security portfolio held by the public



Source: Ministry of Finance, 2012, p. 36

The Federal Public Debt Annual Report of 2012 highlighted market participants' complacency towards duration risk. It noted that "this greater propensity to risk is evinced in the evolution of the rates and premiums paid in fixed rate bond auctions during the year. The average rates accepted for long-term fixed rate bonds registered the lowest historical levels in 2012. That period also revealed a downward trend in premiums for such long-term securities, reflecting greater demand for fixed rate bonds. One should emphasize that longer-term bonds came to be negotiated with negative premiums, as early as the end of the first half of the year." (Ministry of Finance 2013, p.36, emphasis added)

Figure 32: Premium calculated by the difference between the Brazilian forward interest rate structure and futures interest contracts (DI Futures)



Source: Ministry of Finance 2013, p.36

Note: "copied from the original, including the error on the horizontal axis of the chart"

This low volatility environment combined with low risk perception further compressed the bond risk premium, thus reducing the insurance protection against rate changes, that is, long bond yields were too low to provide a cushion for their potential future volatility. As rates consistently declined, bondholders enjoyed a total return bonanza by holding longer-dated sovereign bonds.

Figure 33: Fixed-rate zero coupon term structure



Source: Anbima, 2013

Risk-free sovereign bonds[32]? Lessons from the taper tantrum

As investors are primarily concerned with total returns, we can use Anbima indices to effectively measure the performance of fixed income instruments. They can be divided into two categories: government securities and private securities. The first can be subdivided into two categories: fixed-rate securities (IRF family of indices) and floating rates (such as the Anbima Market Index (IMA-S), which represents a portfolio of floating rate government securities at market prices. The corporate bond category can be represented by IDA, which represents a portfolio of corporate securities (known as debentures) at market prices. For the corporate bond index (IDA) there are two sub-categories: IDA-DI (DI interest linked debentures) and IDA-IPCA (IPCA inflation linked-debentures).

To compare the returns of government bond funds versus other investment alternatives and their exposure to duration risk, we can use the ANBIMA indices for fixed rate government bonds (IRF-M), (IMA-B), government inflation-linked bonds interest-linked government bonds (IMA-S), interest rate-linked debentures (IDA-DI), and inflation-linked debenture (IDA-IPCA). Until 2013, securities portfolios were heavily exposed to interest rate risk to boost returns. The combination of declining interest rate volatility, and the search for yield encouraged market participants to buy longer duration securities. The benchmark Selic rate achieved its historical low levels by March 7, 2013. However, this process was reversed by unfavorable global and local market conditions. Bernanke's taper tantrums in May 22, 2013 raised global yields, and deeply affected securities' market value creating greater volatility of Brazil's local currency bond returns. The price of longer dated government bonds collapsed driving yields upwards.

Figure 34: Long-term real interest rate (NTN-B IPCA-indexed bonds, 2035, 2055 maturities)



Source: Ministry of Finance

Contrary to the myth that bonds are safe heavens, portfolio's duration extension increases the potential for negative returns if market rates suddenly increase more than those implied by forward rates. The increase in duration exposure caused longer duration portfolios to experience greater price volatility, and the total return for Anbima Market Index ("IMA geral") shifted to negative territory in 2013 to -1.4 percent, from 18 percent in 2012, while shorter durations securities suffered smaller price declines.

Figure 35: Government securities rolling 12-month return p.y % (IMA General[33])



Source: ANBIMA

Note that prior to the taper tantrum, both IRF-M (index of fixed rate bonds) and IMA-B (index of IPCA-linked bonds) generated annual returns significantly higher than interest rates on certificates of interbank deposit (CDI). As the IMA-B index has a higher duration compared to IRF-M bonds, it posted superior returns in a low rate environment, which was quickly reversed with the sharp increase in yields in 2013 to negative 10.5 percent return.

Figure 36: IMA return (p.y%) and CDI



Source: ANBIMA, BCB

Reacting to a bond market crisis

The taper tantrum in 2013 led to the rise in yields in fixed-rate and inflation-linked securities, and sharply increased interest rate volatility, so the National Treasury announced "buy and sell" auctions, acting as a market maker to provide liquidity and dampen government bond market volatility by sustaining securities prices.

Figure 37 and 37A: National Treasury auctions (Fixed rate: LTN, NTN-F) and Inflation-Linked: (NTN-F), vertical dotted lines represent auctions





Source: National Treasury 2014

Anbima Constant Duration Index (IDkA) shed light on the performance of investment alternatives with different duration exposures. Note that government bond funds with greater duration,

such as IDkA pre 5A, experienced large price swings over the period analyzed. It impacts investors' total returns exposing their portfolio to losses if rates rise more than implied by forward rates and potential gains, if rates fall. This is in sharp contrast to lower duration investment alternatives, such as IDkA pre 3M and CDI (Interbank Deposit Certificate), which show lower price variation to rate changes.

Figure 38: % Return (12-month moving average) for Anbima Constant Duration Indices (IDkA Pre 3A, Pre 5A) and CDI



Source: ANBIMA, BCB

As expected, higher duration bond positions show significant volatility, while lower duration portfolios exhibit low volatility. In a world in which financial institutions are volatility constrained, short duration

exposures play a major role influencing their portfolio composition towards more stable assets. Moreover, this increase in rate volatility also affects the market value of securities pledged as collateral.



Figure 39: Volatility of fixed rate government bond returns

Source: Anbima

The ex-post bond risk premium shows the historical excess returns of 6.5 years long-term bonds, minus the 6-month rate implied by the term structure of interest rates[34]. During periods of risk aversion, the term premium increases, while during periods of low volatility it decreases. It is worth it noting that it has reached negative levels since November 25, 2014.

Figure 40: Yield curve steepness (fixed-rate term structure of interest rates)



Source: Anbima

Table 7: Fixed-rate (IDkA pre) and IPCA inflation-linked (IDkA IPCA) portfolios

Indox	Index Number	Return		Volatility	Rates	Rates (% p.y.)		
index	Index Number	Daily (%)	Monthly (%)	Yearly (%)	12-Month (%)	(% p.y.) *	Bid (D-1)	Ask (D-0)
Fixed Rate								
IDkA PrÈ 3M	2,713.63	0.0564	1.0713	5.9336	11.7509	0.0884	13.9975	13.9771
IDkA PrÈ 1A	2,975.56	0.1019	0.59	5.0745	9.5937	0.9796	14.3421	14.2863
IDkA PrÈ 2A	3,195.73	0.1984	0.105	4.7941	8.2989	2.8155	13.6714	13.5875
IDkA PrÈ 3A	3,318.95	0.2711	-0.0393	5.0956	8.343	4.5499	13.1435	13.0598
IDkA PrÈ 5A	3,509.30	0.3069	-0.3806	5.2794	8.9101	7.4307	12.7017	12.6433
IPCA Linked								
IDkA IPCA 2A	3,479.99	-0.0087	0.8447	8.0104	12.3753	1.5177	6.5775	6.615
IDkA IPCA 3A	3,543.57	-0.0295	0.5133	7.6177	11.4503	2.4322	6.6505	6.683
IDkA IPCA 5A	3,550.58	-0.1363	0.1142	6.9072	10.7688	4.1257	6.564	6.6062
IDkA IPCA 10A	3,720.60	-0.2142	-0.6747	7.9872	13.2189	6.6312	6.2398	6.269
IDkA IPCA 15A	4,241.54	-0.2001	-1.5201	9.971	16.5693	8.939	6.1039	6.1223
IDkA IPCA 20A	5,009.40	-0.1817	-2.3594	12.1432	19.5916	11.399	6.0355	6.0483
IDkA IPCA 30A	7,155.74	-0.1473	-4.0302	16.7466	23.9984	16.4955	5.967	5.9743

Reference Date: 6/30/2015

* Standard deviation of daily returns calculated over 21 working days.

Source: Anbima

Annualized returns increase monotonically with duration for both, inflation linked (IDkA IPCA) and fixed rate securities (IDkA pre) portfolios. Note the returns from floating rate securities (IMA-S) outperformed intermediate and long duration exposures, with the exception of the 30 years bucket, but this return comes with significant more risk.

Figure 41: Annual Returns of inflation-linked securities (IDkA IPCA) versus floating rate securities (IMA-S)



Source: Anbima

As rates have declined until 2013, fixed rate securities portfolios benefited from strong tail winds. Realized excess returns over short duration instruments are too small to compensate for increasing risk due to duration exposure. Portfolios with higher curve duration (IDkA pre 5 years and IDkA IPCA 30 years) have greater exposure to changes in the interest rate, and show greater price volatility than short duration portfolios, such as IDkA pre 3-month. Duration extension increases the securities' sensitivity to changes in interest rates

Figure 42: Annual nominal returns of portfolios of Brazilian bills and bonds



Source: Anbima

Figure 43: Government fixed rate securities portfolio (IDkA) and floating rate securities (IMA-S) reward and risk



Source: Anbima

Another metric to calculate interest rate exposure uses the security's modified duration (MD) to calculate its DV01, that is, DV01 = [0.01x MD x price] x one-basis point change. Note that a 1 percent increase in market interest rates would cause a portfolio with duration of 9.5, to fall in value by 9.5 percent. The increase in interest rate volatility of the past year has significantly impacted the total returns of longer duration fixed-rate portfolios. Table 8 shows the modified duration for different securities and DI futures. For instance, for NTN-F Jan-25 its modified duration equals 5.2, thus for every one percent change in market interest rates, the market value of the security will move inversely by 5.2 percent. Note that for securities with shorter modified duration, such as LTN Oct-15, its modified duration equals 0.3, so if market interest rates in one percent, then the market value of the security will move inversely by 0.3 percent.

Thus, in a high rate volatility environment, investors shift their demand from longer duration assets to short duration securities (such as higher coupon bonds and shorty maturity instruments), relative to their holding period to minimize their interest rate risk. Portfolio immunization has been widely used by practitioners and fixed income managers, to speculate on rate changes and/or minimize the risk of losses, that is to match the portfolio's duration with the planed holding period. On the short end of the yield curve there has been a sharp increase in interest rates, reflecting the policy tightening cycle initiated in 2013.

Table 8: Modified duration of selected instruments (as of June 18, 2015)

Amount Outstanding (R) billion) Modified Duration vield (% p.y) Rate Rise Rate fail 15-Jul - 0 13.64 - - 0 13.64 15-Aug - 0.1 13.67 -0.1 0.1 0.1 0.1 0.1 15-Sep - 0.2 13.84 -0.2 0.2 0.3 0.3 16-Jan - 0.5 14.25 -0.5 0.5 1.5 16-Jan - 1.5 13.99 -1.5 1.5 1.5 18-Jan - 2.5 13.4 -2.5 2.5 1.5 18-Jan - 5.5 12.68 -5.5 5.5 2.5 19-Jan - 7.5 12.58 -7.5 7.5 2.5 23-Jan - 9.5 15.5 1.6.4pr 0 0 15-Oct 136.8 0.3 14.1 -0.3 0.3 16-Jan 116.6 0.5 14.24							Price Se	nsitivity
STATULE 13.64 IDI FUTURES (DI FUTURES 15-Jul 15-Aug - 0 13.67 DI FUTURES (DI RATE) 15-Sep - 0.1 13.67 0.1 15-Sep - 0.2 13.84 -0.2 0.2 15-Oct - 0.3 14 -0.3 0.3 16-Jan - 0.5 14.25 -0.5 0.5 16-Apr - 0.8 14.3 -0.8 0.8 17-Jan - 1.5 13.99 -1.5 1.5 18-Jan - 2.5 13.4 -2.5 2.5 19-Jan - 3.5 13.07 -3.5 3.5 21-Jan - 7.5 12.58 -7.5 7.5 25-Jan - 9.5 15-50 0.5 16-40 0 0 15-Oct 136.8 0.3 14.1 -0.3 0.3 14.1 -0.3 0.3 16-Jan 116.6				Amount Outstanding (R\$ billion)	Modified Duration	yield (% p.y)	Rate Rise	Rate fall
Image: Signature 15-Jul - 0 13.65 15-Aug - 0.1 13.67 -0.1 0.1 15-Sep - 0.2 13.84 -0.2 0.2 15-Oct - 0.3 14 -0.3 0.3 16-Jan - 0.5 14.25 -0.5 0.5 16-Jan - 0.8 14.3 -0.8 0.8 17-Jan - 1.5 13.99 -1.5 1.5 18-Jan - 2.5 13.4 -2.5 2.5 19-Jan - 3.5 13.07 -3.5 3.5 21-Jan - 7.5 12.58 -7.5 7.5 23-Jan - 7.5 12.58 -7.5 7.5 25-Jan - 9.5 12.56 -9.5 9.5 16-Det 136.8 0.3 14.1 -0.3 0.3 16-Jan 116.6 0.5 14.24 -0.5 <th></th> <td></td> <td></td> <td></td> <td></td> <td>13.64</td> <td></td> <td></td>						13.64		
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VIN-F IS-Sep - 0.2 13.84 -0.2 0.2 15-Oct - 0.3 14 -0.3 0.3 16-Jan - 0.5 14.25 -0.5 0.5 16-Jan - 0.8 14.3 -0.8 0.8 17-Jan - 1.5 13.99 -1.5 1.5 18-Jan - 2.5 13.4 -2.5 2.5 19-Jan - 3.5 13.07 -3.5 3.5 21-Jan - 7.5 12.58 -7.5 7.5 23-Jan - 7.5 12.58 -7.5 7.5 25-Jan - 9.5 12.56 -9.5 9.5 15-Oct 136.8 0.3 14.1 -0.3 0.3 16-Jan 116.6 0.5 14.24 -0.5 0.5 16-Apr 86.7 0.7 14.34 -0.7 0.7 16-Jul 62.5 0.9			15-Aug	-	0.1	13.67	-0.1	0.1
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Image: Signature DI FUTURES (DI RATE) 16-Apr 17-Jan - 0.8 14.3 -0.8 0.8 (DI RATE) 17-Jan - 1.5 13.99 -1.5 1.5 18-Jan - 2.5 13.4 -2.5 2.5 19-Jan - 3.5 13.07 -3.5 3.5 21-Jan - 5.5 12.68 -5.5 5.5 23-Jan - 7.5 12.58 -7.5 7.5 25-Jan - 9.5 12.56 -9.5 9.5 15-Oct 136.8 0.3 14.1 -0.3 0.3 16-Jan 116.6 0.5 14.24 -0.5 0.5 16-Apr 86.7 0.7 14.34 -0.7 0.7 16-Oct 33.7 1.1 14.19 -1.1 1.1 17-Jan 55.1 1.3 13.98 -1.3 1.3 17-Jan 48.8 2.2 13.39 -2.2 2.2			16-Jan	-	0.5	14.25	-0.5	0.5
Image: Barbon Matrix Image: Display barbon matrix Image:		DI FUTURES	16-Apr	-	0.8	14.3	-0.8	0.8
IB-Jan - 2.5 13.4 -2.5 2.5 19-Jan - 3.5 13.07 -3.5 3.5 21-Jan - 5.5 12.68 -5.5 5.5 23-Jan - 7.5 12.58 -7.5 7.5 25-Jan - 9.5 12.56 -9.5 9.5 15-Jul 48.3 0 14.04 0 0 15-Oct 136.8 0.3 14.1 -0.3 0.3 16-Jan 116.6 0.5 14.24 -0.5 0.5 16-Apr 86.7 0.7 14.34 -0.7 0.7 16-Jul 62.5 0.9 14.28 0.9 0.9 16-Jul 62.5 0.9 14.28 0.9 0.9 17-Jan 55.1 1.3 13.98 -1.3 1.3 17-Jul 48.4 1.8 13.7 -1.8 1.8 18-Jan 48.8 2.2 13.39		(DI RATE)	17-Jan	-	1.5	13.99	-1.5	1.5
Image: Second state 19-Jan - 3.5 13.07 -3.5 3.5 21-Jan - 5.5 12.68 -5.5 5.5 23-Jan - 7.5 12.58 -7.5 7.5 25-Jan - 9.5 12.56 -9.5 9.5 15-Jul 48.3 0 14.04 0 0 15-Oct 136.8 0.3 14.1 -0.3 0.3 16-Jan 116.6 0.5 14.24 -0.5 0.5 16-Apr 86.7 0.7 14.34 -0.7 0.7 16-Jul 62.5 0.9 14.28 -0.9 0.9 16-Oct 33.7 1.1 14.19 -1.1 1.1 17-Jan 55.1 1.3 13.98 -1.3 1.3 17-Jul 48.4 1.8 13.7 -1.8 1.8 18-Jan 48.8 2.2 13.39 -2.2 2.2 18-Jul 45.1<			18-Jan	-	2.5	13.4	-2.5	2.5
LTN 21-Jan - 5.5 12.68 -5.5 5.5 23-Jan - 7.5 12.58 -7.5 7.5 25-Jan - 9.5 12.56 -9.5 9.5 15-Jul 48.3 0 14.04 0 0 15-Oct 136.8 0.3 14.1 -0.3 0.3 16-Jan 116.6 0.5 14.24 -0.5 0.5 16-Apr 86.7 0.7 14.34 -0.7 0.7 16-Jul 62.5 0.9 14.28 -0.9 0.9 16-Oct 33.7 1.1 14.19 -1.1 1.1 17-Jan 55.1 1.3 13.98 -1.3 1.3 17-Jul 48.4 1.8 13.7 -1.8 1.8 18-Jan 48.8 2.2 13.39 -2.2 2.2 18-Jul 45.1 2.7 13.27 -2.7 2.7 19-Jan 68.6			19-Jan	-	3.5	13.07	-3.5	3.5
Image: Normal base in the second se			21-Jan	-	5.5	12.68	-5.5	5.5
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SITURE 15-Jul 48.3 0 14.04 0 0 15-Oct 136.8 0.3 14.1 -0.3 0.3 16-Jan 116.6 0.5 14.24 -0.5 0.5 16-Apr 86.7 0.7 14.34 -0.7 0.7 16-Jul 62.5 0.9 14.28 -0.9 0.9 16-Oct 33.7 1.1 14.19 -1.1 1.1 17-Jan 55.1 1.3 13.98 -1.3 1.3 17-Jul 48.4 1.8 13.7 -1.8 1.8 18-Jan 48.8 2.2 13.39 -2.2 2.2 18-Jul 45.1 2.7 13.27 -2.7 2.7 19-Jan 68.6 3.1 13.11 -3.1 3.1 17-Jan 73.4 1.2 14.01 -1.2 1.2 18-Jan 14.8 1.9 13.4 -1.9 1.9 19-Jan 10.7 <th></th> <td></td> <td>25-Jan</td> <td>-</td> <td>9.5</td> <td>12.56</td> <td>-9.5</td> <td>9.5</td>			25-Jan	-	9.5	12.56	-9.5	9.5
SIGN 13-Oct 136.8 0.3 14.1 -0.3 0.3 16-Jan 116.6 0.5 14.24 -0.5 0.5 16-Apr 86.7 0.7 14.34 -0.7 0.7 16-Jul 62.5 0.9 14.28 -0.9 0.9 16-Oct 33.7 1.1 14.19 -1.1 1.1 17-Jan 55.1 1.3 13.98 -1.3 1.3 17-Jul 48.4 1.8 13.7 -1.8 1.8 18-Jan 48.8 2.2 13.39 -2.2 2.2 18-Jul 45.1 2.7 13.27 -2.7 2.7 19-Jan 68.6 3.1 13.11 -3.1 3.1 17-Jan 73.4 1.2 14.01 -1.2 1.2 18-Jan 14.8 1.9 13.4 -1.9 1.9 19-Jan 10.7 2.6 13.08 -2.6 2.6 21-Jan 85			15-Jul	48.3	0	14.04	0	0
Image: Non-section 110.6 0.5 14.24 -0.5 0.5 16-Jun 16-Apr 86.7 0.7 14.34 -0.7 0.7 16-Jul 62.5 0.9 14.28 -0.9 0.9 16-Oct 33.7 1.1 14.19 -1.1 1.1 17-Jan 55.1 1.3 13.98 -1.3 1.3 17-Jul 48.4 1.8 13.7 -1.8 1.8 18-Jan 48.8 2.2 13.39 -2.2 2.2 18-Jul 45.1 2.7 13.27 -2.7 2.7 19-Jan 68.6 3.1 13.11 -3.1 3.1 17-Jan 73.4 1.2 14.01 -1.2 1.2 18-Jan 14.8 1.9 13.4 -1.9 1.9 19-Jan 10.7 2.6 13.08 -2.6 2.6 21-Jan 85 3.6 12.72 -3.6 3.6 21-Jan	Ś		15-Oct	136.8	0.3	14.1	-0.3	0.3
NTN-F 16-Apr 86.7 0.7 14.34 -0.7 0.7 16-Jul 62.5 0.9 14.28 -0.9 0.9 16-Oct 33.7 1.1 14.19 -1.1 1.1 17-Jan 55.1 1.3 13.98 -1.3 1.3 18-Jan 48.8 2.2 13.39 -2.2 2.2 18-Jul 45.1 2.7 13.27 -2.7 2.7 19-Jan 68.6 3.1 13.11 -3.1 3.1 17-Jan 73.4 1.2 14.01 -1.2 1.2 18-Jan 14.8 1.9 13.4 -1.9 1.9 19-Jan 10.7 2.6 13.08 -2.6 2.6 21-Jan 85 3.6 12.72 -3.6 3.6	TE		16-Jan	110.0	0.5	14.24	-0.5	0.5
LTN 16-Oct 33.7 1.1 14.19 -1.1 1.1 17-Jan 55.1 1.3 13.98 -1.3 1.3 17-Jul 48.4 1.8 13.7 -1.8 1.8 18-Jan 48.8 2.2 13.39 -2.2 2.2 18-Jul 45.1 2.7 13.27 -2.7 2.7 19-Jan 68.6 3.1 13.11 -3.1 3.1 17-Jan 73.4 1.2 14.01 -1.2 1.2 18-Jan 14.8 1.9 13.4 -1.9 1.9 19-Jan 10.7 2.6 13.08 -2.6 2.6 18-Jan 10.7 2.6 13.08 -2.6 2.6 21-Jan 85 3.6 12.72 -3.6 3.6 21-Jan 85 3.6 12.72 -3.6 3.6	R⊿		16-Apr	60.7	0.7	14.54	-0.7	0.7
NTN-F 10-Oct 53.7 1.1 14.19 -1.1 1.1 17-Jan 55.1 1.3 13.98 -1.3 1.3 17-Jul 48.4 1.8 13.7 -1.8 1.8 18-Jan 48.8 2.2 13.39 -2.2 2.2 18-Jul 45.1 2.7 13.27 -2.7 2.7 19-Jan 68.6 3.1 13.11 -3.1 3.1 17-Jan 73.4 1.2 14.01 -1.2 1.2 18-Jan 14.8 1.9 13.4 -1.9 1.9 19-Jan 10.7 2.6 13.08 -2.6 2.6 21-Jan 85 3.6 12.72 -3.6 3.6	Ļ	LTN	16-Jul	22.5	0.9	14.20	-0.9	0.9
NTN-F 17-Jan 33.1 1.3 13.53 1.5 1.5 1.5 17-Jul 48.4 1.8 13.7 -1.8 1.8 1.8 18-Jan 48.8 2.2 13.39 -2.2 2.2 2.2 18-Jul 45.1 2.7 13.27 -2.7 2.7 19-Jan 68.6 3.1 13.11 -3.1 3.1 17-Jan 73.4 1.2 14.01 -1.2 1.2 18-Jan 14.8 1.9 13.4 -1.9 1.9 19-Jan 10.7 2.6 13.08 -2.6 2.6 21-Jan 85 3.6 12.72 -3.6 3.6	N	LIN	10-000 17-lan	55.7	1.1	13 98	-1.1	1.1
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NTN-F 17-Jan 68.6 3.1 13.11 -3.1 3.1 19-Jan 68.6 3.1 13.11 -3.1 3.1 17-Jan 73.4 1.2 14.01 -1.2 1.2 18-Jan 14.8 1.9 13.4 -1.9 1.9 19-Jan 10.7 2.6 13.08 -2.6 2.6 21-Jan 85 3.6 12.72 -3.6 3.6	2		18-Jul	45.1	2.7	13.27	-2.7	2.7
NTN-F 17-Jan 73.4 1.2 14.01 -1.2 1.2 18-Jan 14.8 1.9 13.4 -1.9 1.9 19-Jan 10.7 2.6 13.08 -2.6 2.6 21-Jan 85 3.6 12.72 -3.6 3.6			19-Jan	68.6	3.1	13.11	-3.1	3.1
NTN-F 18-Jan 14.8 1.9 13.4 -1.9 1.9 19-Jan 10.7 2.6 13.08 -2.6 2.6 21-Jan 85 3.6 12.72 -3.6 3.6			17-Jan	73.4	1.2	14.01	-1.2	1.2
NTN-F 19-Jan 10.7 2.6 13.08 -2.6 2.6 21-Jan 85 3.6 12.72 -3.6 3.6			18-Jan	14.8	1.9	13.4	-1.9	1.9
21-Jan 85 3.6 12.72 -3.6 3.6			19-Jan	10.7	2.6	13.08	-2.6	2.6
		IN I IN-F	21-Jan	85	3.6	12.72	-3.6	3.6
23-Jan 55.3 4.5 12.59 -4.5 4.5			23-Jan	55.3	4.5	12.59	-4.5	4.5
25-Jan 56.9 5.2 12.55 -5.2 5.2			25-Jan	56.9	5.2	12.55	-5.2	5.2
16-Aug 75.9 1 7.12 -1 1			16-Aug	75.9	1	7.12	-1	1
17-May 41.5 1.7 6.57 -1.7 1.7			17-May	41.5	1.7	6.57	-1.7	1.7
18-Aug 52.4 2.7 6.62 -2.7 2.7			18-Aug	52.4	2.7	6.62	-2.7	2.7
19-May 47.8 3.3 6.65 -3.3 3.3			19-May	47.8	3.3	6.65	-3.3	3.3
20-Aug 51.5 4.1 6.46 -4.1 4.1			20-Aug	51.5	4.1	6.46	-4.1	4.1
22-Aug 79.6 5.4 6.28 -5.4 5.4	E SI	NTN-B	22-Aug	79.6	5.4	6.28	-5.4	5.4
23-Mar 0 5.8 6.22 -5.8 5.8	(AT		23-Mar	0	5.8	6.22	-5.8	5.8
23-May 36.7 6 6.31 -6 6	L		23-May	36.7	6	6.31	-6	6
24-Aug 44.3 6.6 6.21 -6.6 6.6	EA		24-Aug	44.3	6.6	6.21	-6.6	6.6
20-Aug 28.8 9.4 5.99 -9.4 9.4	R		30-Aug	28.8	9.4	5.99	-9.4	9.4
May-35 38.3 11.2 6 -11.2 11.2			May-35	38.3	11.2	6	-11.2	11.2
Aug-40 37.4 12.4 5.95 -12.4 12.4			Aug-40	37.4	12.4	5.95	-12.4	12.4
Wiay-45 /4.1 13.5 5.94 -15.5 13.5			Aug 50	74.1	14.1	5.94	-13.5	13.5
May-55 7.6 14.8 5.94 -14.8 14.8			May-55	7.6	14.1	5.92	-14.1	14.1

Source: ItauBBA 2015



Figure 44: Swap rates (ID vs. Fixed Rate)

Source: BM&FBovespa

Brazil's private fixed income market

The creation of new sources of financing and funding are at the center of discussions to promote real capital development in Brazil. It has been suggested that access to capital markets and long-term investors are a possible solution to the dilemma faced by Brazil's increasing financing requirements (such as infrastructure investment and mortgage lending needs), and the limited access to long-term funding in the country. There is a consensus in favor of the development of the debt securities and the securitization markets in Brazil, to foster its capital market and long-term funding. This argument is based on the assumption that traditional banks and the

existing financial structure are unable, due to funding constraints, to meet the growing financing needs of the Brazilian economy.



Figure 45: Brazil's fixed income market (R\$ billion)

Source: Anbima, BCB, Cetip

Though Brazil's private fixed income market has grown with a sharp increase in corporate debt securities (debentures), it developed towards floating rate instruments. As of November 2013, 89 percent of the private fixed income securities were indexed to the DI interest rate.

Figure 46: Brazil's private fixed income market (R\$ billion)



Source: Anbima

Figure 47: Local-currency Project Bonds: Debentures Outstanding volume (BRL million) and Yield (% p.y.) as of Feb 10th, 2015.



Though there has been growing efforts to develop the fixed income capital market in Brazil, in particular towards longer-dated instruments and private securities (see Torres Filho and Macahyba 2015), most of the discussion has overlooked the impacts of the level and volatility of interest rates dampening the issuance of private fixed income instruments with long maturities, to finance the acquisition of capital assets. For instance, the total return index for private fixed income instruments (debentures) displays a better measurement about its performance relative to other investment alternatives. If we look at the IDA-DI, the Anbima Debentures Index (IDA) linked to floating DI rates total returns, relative to the benchmark Selic rate in a few occasions, the returns of Brazil Corporate Bond Funds outperformed the benchmark Selic rate over the period analyzed.

Figure 48: IDA-DI rolling returns (% p.y), IDA-DI duration and Selic rate



Source: Anbima, BCB

To illustrate the relevance of interest rate and liquidity risks Table 9 demonstrates the price impact of a one basis point on the market value of different securities.

Table 9: Price sensitivity of selected fixed income instruments

	Market	Duration	12-	24-	Price Se	ensitivity
	value (R\$	(years)	month	month	100 basis	100 basis
	billion)		return	return	point rate	point rate
As of July 2015					increase	decrease
Government Securities						
Fixed rate government bonds (IRF-M)	1006	1.9	9.7%	20.6%	- 1.9%	1.9%
Inflation linked bonds (IMA-B)	720	0.4	13.3%	21.1%	- 0.4%	0.4%
Interest rate linked bonds (IMA-S)	499	0	11.8%	22.6%	0.0%	0.0%
IMA General Index	2322	3.6	11.4%	21.2%	- 3.6%	3.6%
Corporate Securities						
Interest rate Linked debentures (IDA-DI)	30	1.7	13.0%	25.1%	- 1.7%	1.7%
Inflation Linked debentures (IDA-IPCA)	25	4.3	11.6%	21.9%	- 4.3%	4.3%

Source: Anbima

Note that the greater the duration of the underlying instrument, the greater the price impact on the security affecting its total return. Corporate securities, such as inflation-linked debentures and interest linked debentures, show significant price sensitivity to interest rate changes due to their longer durations. On the other hand, inflation linked government securities and interest rate-linked government securities have lower price variations, which, not surprisingly, exhibit the lowest durations among the securities analyzed. Because market participants are interested in redeeming their total returns, greater interest rate volatility poses greater risks for longer duration positions. This has been the major obstacle for investors to extend their portfolios' duration.

Credit Risk Premium

Recent initiatives to foster the development of Brazil's private fixed income market pay little attention to the total return provided by corporate fixed income instruments. Active rate manipulations have

increased volatility of the bond risk premium required to compensate investors for duration exposure. If one adds credit risk to interest rate risk, then the development of the debenture market requires lower and stable interest rates. For instance, interest rate-linked debentures (IDA-DI with a duration of 1.7 year, provided a 12-month return equal to 13 percent, while fixed rate government bonds (IRF-M) with a duration of 1.9 year posted a 9.7 percent return. For longer-term instruments, such as inflation-linked debenture (IDA-IPCA), duration of 4.3 years, its 12-month total return was 11.6 percent. High and unstable Selic rate has created a tug-of-war between investors and issuers. As the total yield on a corporate bond must include a credit spread over a riskless sovereign bond, the yield required to induce investors to hold corporate instruments with longer durations would cause the project being financed to be unprofitable. From the issuer's perspective, not surprisingly, debenture issuance has been concentrated on the short end of the yield curve to minimize the interest rate risk component, thus reducing the overall yield.

In a developed fixed income market, we should expect to find excess returns (12-month rolling) of corporate over government bonds, to compensate for default risk[35] and a credit risk premium, that is, if investors are interested in greater credit-risk exposure, then we would expect to see excess returns of corporate bond positions over government securities with similar maturity characteristics to compensate for a potential default, plus a credit risk premium, that is, a credit spread. To further examine duration-adjusted excess returns of corporate securities versus government bonds, one can compare Brazil's Corporate Bond Funds indices versus Anbima interest rate-linked debentures Index (IDA-DI). For Brazil's Government Bond Funds, we can look at interest-linked government bonds (IMA-S) and fixed rate bonds (IRF-M).

Figure 49 and 49A shows the corporate bond-risk premium, that is, when corporate bonds outperformed government securities.

However, the number of periods in which corporate bond funds (represented by IDA-DI) outperformed government bond funds (IRF-M and IMA-B) is small. The bond risk premium plus the credit spread are not attractive to induce bondholders to take the risk. However, over the period analyzed, corporate bonds consistently outperformed government bond funds with short durations (such as IMA-S and IDkA Pre 3M).

Figure 49 and 49A: Corporate bond-risk premium (Excess returns 12month rolling over government securities)





Source: Anbima

Since excess returns might reflect duration exposure, it becomes important to calculate the corporate bond risk premium by comparing their excess returns with securities with similar duration characteristics. Over the period analyzed we observe large swings in the credit spread. Excess returns of corporate bond funds index over duration-matched government securities show that corporate bonds have either underperformed, or performed poorly government securities over the period analyzed.

The corporate bond index has consistently underperformed government bonds, and the annual excess return of corporate bond over the domestic fixed rate bond index (IRF-M) has been just 0.4. As investors expect higher returns to take on more risk (such as credit risk), investors typically require a risk premium, in addition to potential loss from default, however, the small realized credit premium might discourage increasing holdings of corporate debt.

	A	CN4.0/	(-1-1)
2009-2015	Average (AlVI) %	GIVI %	volatility (%)
IDKA IPCA 10A	14.4	13.6	13.2
	15.5	14.0	17.6
	16.7	14.0	21.8
	12.6	17.5	21.0
	10.9	15.0	20.1
	19.0	10.2	50.1
	12.5	12.7	5.5
	15.5	10.6	7.9
	10.7	11.2	2.5
IDKA Pre ZA	11.4	11.3	4.4
IDKA Pre 3A	11.9	11.7	6.1
IDKA Pre 3IVI	9.8	9.8	1.4
IDKA Pre 5A	12.8	12.5	8.9
IMA-S	18.8	18.8	1.6
IRF-M	10.2	10.1	3.4
IMA-B	11.7	11.3	8.9
IMA-B 5	11.3	11.3	3.6
IDA-DI	10.6	10.6	1.3

Table 10: Corporate bond funds index over government securities

Source: Anbima

Figure 50: Excess returns of corporate bonds (IDA-DI) over durationmatched government securities (2009-2015)



Source: Anbima

Thus, debenture issuance has been concentrated on the short end of the yield curve and, according to Anbima, as of 2012, 45 percent the proceeds of debenture issuance have been used to repay outstanding expensive obligations (such as bank loans), 19 percent for equity capital, 19 percent for working capital, 9 percent in project implementation, 5 percent was used for redemption or repurchase of previous issuance, 2 percent in infrastructure investment, and 1 percent was allocated in fixed assets. From the issuer's perspective, debentures have lower funding costs compared to bank loans, but its yield is still expensive to fund productive capital assets. Moreover, corporate bonds total returns have not attracted institutional investors nor banks to take advantage of regulatory arbitrage, which have purchased most of the debenture issued. Note that Federal Law 12,431/11 introduced the so-called infrastructure debentures grating tax benefits, and as of December 2014, the total amount outstanding was R\$ 15 billion and banks' holdings exceeded 50 percent[36].



Figure 51: Corporate debenture holders as of December-14

Source: Ministry of Finance 2015

Without a reduction of the benchmark Selic rate towards zero, the overall costs (including the credit spread) of debentures issued by corporations would be too high, which would require a higher expected return on capital assets. At such high rates, fewer investment projects would be profitable. Thus, it is not surprising that the proceeds of debentures issuance have been used primarily to repay expensive outstanding bank loans. Reduction in yields and rate volatility on government securities will push investors to add credit risk, in addition to duration risk, to their portfolios. That is, market participants would seek to boost their total returns by taking credit risk.

Derivatives and interest rate risk

When managing overall interest rate exposure, a financial institution can use on-balance sheet adjustments by changing its duration gap, that is, by adjusting the underlying duration of assets and liabilities, and using derivatives, in particular interest rate swaps. In this regard, the growth of the fixed income market combined with the volatility of interest rates have also encouraged the development of the derivatives market to deal with interest rate risk (table 11). That is, the federal government's initiative to increase the share of fixed rate debt has increased domestic hedging activity in the futures market (Costa, Nespoli, and Robitaille 2007, p.13).

Table 11: Derivatives markets are increasingly active

OTC interest rate derivatives turnover,¹ by currency

,				
	2007	2010	2013	Growth 2010–13
		In billions of US doll	In per cent	
All currencies	1685.5	2053.7	2343.0	14.1
EUR	655.8	833.9	1145.8	37.4
USD	532.4	653.6	656.9	0.5
GBP	172	213.5	186.8	-12.5
AUD	18.7	36.6	76.1	107.7
JPY	136.7	124	69.6	-43.9
SEK	32.9	20.2	36.2	78.7
CAD	15.5	48.3	29.7	-38.4
BRL	1.7	3	16.3	450
ZAR	3.2	5.4	15.8	191.3
CNY	0.2	1.9	14.5	652.8
CHF	18.6	20.4	14.4	-29.3
KRW	4.8	16.4	12.1	-26.2
MXN	5.3	4.6	9.6	109.9

Net-net basis,² daily averages in April

¹ Forward rate agreements, interest rate swaps, interest rate options and other interest rate products. ² Adjusted for local and cross-border inter-dealer double-counting.

Sources: Triennial Central Bank Survey; authors' calculations.

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Table 1

Source: Gyntelberg and Upper (2013)

Increasing interest rate risk has sharply increased over the counter interest rate derivatives turnover in Brazil, from US\$ 1.7 billion in 2007 to 16.3 billion in 2013. As foreign investors increased their holdings of sovereign debt, their participation in the total value of interest rates derivatives contracts denominated in R\$ increased to 39 percent at the end of 2014.

Figure 52: Investor's Participation in interest rates denominated in BRL Volume - BM&F Segment



Source: BM&FBovespa

High and unstable interest rates have also driven a significant turnover growth in interest rate derivatives. For instance, the notional amount of interest rate derivatives contracts traded at BM&FBovespa has sharply increased.

Figure 53: Interest rate derivatives and FX futures BM&F Segment (ADV in number of contracts)



Source: BM&FBovespa

DI futures are the most traded future[37] in Brazil. According to the 2013 FIA survey, as of 2013, the one day inter-bank deposit futures at Brazil's BM&FBovespa "was the second most actively traded interest rate contract in the world." (Acworth 2014 p.17). Both, the volume and the number of open contracts, have increased substantially. By 2001, virtually all contracts in DI Futures on the BM&FBovespa were less than one year, while in 2013 the average monthly volume in DI interest rate futures contracts traded less than one year represented 62 percent of all contracts in DI Futures on the BM&FBovespa. Note that by using this contract, one can swap from floating rate into fixed rate, and it is like a zero-coupon bond, with the exception of daily settlement.

Figure 54 and 54A: Volume of DI interest rate future contracts (R\$ million) and number of open contracts by time to maturity at BM&FBovespa



Source: Credit Suisse 2014

One day DI futures and option on the average one-day interbank deposit rate index (IDI) options are highly active and liquid showing increasing trading volume in the Brazilian market. Due to the characteristics of the IDI options contract, that is the payoffs depend on the average one-day interbank deposit rate over the contract period, they have been of the main instruments to manage interest rate risk. Foreign institutional investors have played the role of net suppliers of DI futures, while banks and domestic institutional investors have not.



Figure 55: Interest rate derivatives position by market participant

Source: BMF&Bovespa

Non-resident investors increasingly taking positions are in government securities to take advantage of carry trade incentives, they increased their holdings from around 5 percent of domestic sovereign debt in 2007, to 21 percent in May 2015. As a recent BIS report concluded, in this period the total returns for carry trades[38] using the US dollar as a funding currency and the domestic currency, the Real, as a target has been high (BIS 2015). Foreign investors with short trading horizons have taken advantage of high government bond yields, in which "the most usual (onshore) carry trade has involved the purchase of long-tenor nominal government bonds (2021, 2023 and 2025 NTN-Fs. An alternative is to purchase shortterm LTNs, or credit-linked notes (CRIs and CRAs) with no hedge. All products related to carry trades are accessible, since most of them are transacted on stock and derivatives exchanges, with one- to sixmonth trading horizons." (BIS 2015, p.6). Macroprudential measures
to curb capital flows to Brazil[39] since the global crisis has also encouraged the development of off shore transactions using derivatives, in particular off shore non-deliverable forwards[40] (NDFs), that is, "For the Brazilian real non-deliverable derivative instruments are the main driver of the foreign exchange market, and are the most liquid instrument for BRL FX trades. As a result, the daily volume traded in derivatives is also very large. For the BRL, derivatives (especially offshore NDFs) are thus the main vehicle for investors looking to implement carry trades. Foreign investors use NDF markets as a reference for local swaps and forward curves. While the bulk of carry trades involves the acquisition of financial instruments such as government bonds, derivatives play a very important role in Brazil. (BIS 2015, p. 7-8)

Note that with the development of the derivatives market, this strategy can be replicated by taking futures positions in US dollars at BM&FBovespa. As the BIS report noted, a similar currency carry trade strategy can be implemented in the onshore Brazilian derivatives market, as an investor taking a short position in USD futures at BM&FBovespa. The main difference is that this contract requires daily cash settlement for the change in its price. Alternatively, the (non-deliverable) "cupom cambial" is an interest rate future for which the underlying asset, the "cupom cambial" is calculated from the ratio between the capitalized interbank deposit rates (in the period between the trade date and the last trading day), and the exchange rate variation (in the period between the business day preceding the trade date and the last trading day). There is no exchange of the underlying asset. An investor long BRL will gain in the event of an interest rate shock (increase), and lose in the event of an exchange rate shock (depreciation)." (BIS 2015, p. 7-8).

The government policy to reduce floating rate and dollar-indexed securities in total domestic federal marketable debt means that these risks were transferred to market participants. Though there was a

sharp increase, the demand for derivatives contracts as market participants can use DI futures to switch from fixed to floating interest rate exposure (these contracts are equivalent to swapping fixed-rate interest payments for floating-rate interest payments), the costs associated with reducing dollar-indexed government securities-that is, the provision of foreign exchange hedge- were transferred from the National Treasury to the Central Bank's through its interventions using spot, short-term forwards, and foreign exchange swaps[41]. When the BCB auctions foreign exchange swaps, this is equivalent to selling US dollars at a future date as it pays the foreign exchange variation plus the "cupom cambial" (onshore dollar interest rate), while it gets the interbank deposit rate (CDI) on the other leg while reverse foreign exchange swaps are equivalent to buying dollars on a future date, that is it pays the interbank deposit rate (CDI) and receives the foreign exchange variation plus the "cupom cambial". In spite of this shift from the Treasury to the BCB in providing foreign exchange hedge, ironically, BCB's end year results are transferred back to the Treasury.

Banks' interest rate risk

Banks are liquidity creators, but not all liquidity is created by banks (Kregel 2014, Rezende 2011). Banks buy assets through the issuance of liabilities. Contrary to the conventional wisdom that banks need prior reserves to increase bank lending, when a bank extends credit purchasing a loan, it simultaneously creates a deposit liability. That is, a bank loan corresponds to a liability swap. The bank accepts the borrower's liability in exchange for banks deposits. Banks are liquidity creators. They buy illiquid IOUs from firms and households, and issue their own IOUs that are more liquid and can be used to buy financial and real assets, goods and services, and even to pay taxes. From this point of view, banks operate from assets to liabilities. When

a bank makes a mortgage loan, say a 30-year fixed rate mortgage loan, it issues a demand deposit.

Thus, a bank is not constrained by existing funds (deposits or reserves) to increase lending as they can operationally finance long term assets by issuing government insured deposit liabilities and profit, from a steep and normal shaped yield curve. However, the financing of long-term assets by them would impose significant asset liability mismatches on banks' balance sheets. The important question is related to the costs of carrying a mismatch between the duration of assets and liabilities on banks' balance sheets, as long as interest and funding risks are carried on banks' balance sheets.

During the early 1990s, Kregel, building on Minsky, developed a framework to analyze how different financial structures develop financial fragility over time. In his writings, in particular (Kregel 1992a, 1992b, 1993a, 1993b), on financial fragility and the structure of financial markets, Kregel rather than characterizing financial systems as market based or bank based, pointed out that one should distinguish between the risks that are carried on the balance sheets of banks and other financial institutions (Kregel 1993). Ongoing discussions about the creation of long-term funding instruments for Brazilian financial institutions miss the point of banking, by ignoring the fact "maturity mismatching and liquidity creation are usually linked together" (Kregel, 1993, p.3).

From this perspective, fragility is inherent in the successful operation of the capitalistic economic system, and results from changes in the liquidity preferences of bankers and businessman, as represented by changes in the margins of safety required on liquidity creation produced by maturity transformation. Thus, fragility could result even in a perfectly stable financial system, as defined under the traditional terminology, because of changes in the extent of the creation of liquidity for a given degree of mismatching. In this case, a fall in liquidity preference could take place, the maturity mismatching would remain constant, as bankers become willing to lend against more risky assets. (Kregel 1993, p.3)

The acceptance of 30-year fixed-rate assets by banks is inherently risky. A change in the yield curve, such as changes in short-term rates and an inverted yield curve, have the potential to create losses (such as a squeeze in net interest margins and insolvency, such as the US Savings and Loans crisis in the 1980s). The difficulty from the bank's perspective, in the absence of an active secondary mortgage market to pledge illiquid assets as collateral or official sources of liquidity, is the concentration towards less liquid higher yielding assets, bringing about the potential for a liquidity problem and substantial interest rate risk.

Though interest risk exposure is part of the banking business[42], traditional private banks are unwilling to be exposed to the interest rate risk by financing 30-year mortgage loans, particularly when the macroeconomic policy brings about high interest volatility to fight inflation. Not only high and volatile interest rates have a negative impact on domestic investment, but they are also one of the main obstacles to the development of long-term financing. This maturity mismatch exposes banks to interest rate risk, which can be managed in a variety of ways. To insulate the net interest margin against changes in rates, banks use interest-sensitive gap management to protect their earnings and more sophisticated models, such as economic value of equity and earnings simulation models. (See for instance Bierwag 1987; Clair, Touhey, and Turbeville 2009). This led to the development of hedging strategies, such as immunization[43] and use of derivatives such as interest-rate swaps, future and forward rate agreements, interest-rate options, caps, floors, collars, and securitization (Shaffer 1991).

Comme	ercial banks Liabilities
Interest bearing assets Fixed-rate assets (loans, securities, etc)	Non-interest bearing liabilities (demand deposits)
Floating-rate assets (loans, securities, etc)	Interest bearing liabilities saving, time, and interbank deposits, deposits received under repurchase agreements, funds from acceptance and issuance of securities, borrowings and onlendings, subordinated debt, derivative financial instruments
Non-interest bearing assets Currency Reserves	Loans from the centrak bank
Other assets	Equity

Table 12: Simplified bank balance sheets

A bank can adjust its portfolio by shortening its asset duration purchasing adjustable rate mortgages and other instruments, such as asset backed securities, futures, options and swaps (Shaffer 1991, 22-23). It can shorten its portfolio duration by buying variable rate loans and short duration securities. For instance, during a monetary policy tightening cycle, banks can increase the proportion of adjustable-rate loans relative to fixed rate assets. Note that fixed-rate mortgage loans have greater interest rate exposure, compared to adjustable-rate mortgage loans. If the institution expects that interest rates will increase, then it can shorten the duration of its assets (buying higher coupon or floating rate securities), or enter into a derivative transaction (such as forward, futures, and swaps) to pay fixed and received floating rates. This shift in the portfolio preference changes the demand for assets with longer durations, causing their price to fall. It also opens the possibility to generate destabilizing effects due to portfolio immunization, if investors speculate in the wrong direction, or in the event of a monetary policy surprise.

It can also use derivatives contracts such as financial futures, interest rate options and swaps, to either shorten or lengthen its portfolio's duration (Shaffer 1991). In a rising rate environment, a financial institution can enter in a swap transaction to pay fixed rate, and receive floating rate. In addition, it can shorten the bond by selling futures contracts and cancel out the position at the delivery date. Alternatively, the purchase (sale) of interest-rate futures contracts increases (decreases) a portfolio's duration.

A bank can use off-balance-sheet derivative contracts based on interest rates, to control interest rate risk. The notional amount outstanding of over-the-counter (OTC) interest rate derivatives sharply increased. By moving assets off balance sheets, a bank not only augment its earnings due to fee income, but also reduces its asset duration and interest rate risk. However, as Shaffer (1991) argued, "[t]he success of this method requires, among other things, a demand for the securitized asset" (Shaffer 1991, 24).

To protect earnings and funding costs against interest rate risk, financial institutions use interest-sensitive gap management to shield their net interest margin. The latter is affected by the shape of the yield curve, the volume, and mix -floating and fixed-rate instruments, maturity structure, and high-yield and low-yield instruments- of interest-bearing assets and liabilities.

Using the basic gap model, if the manager of a financial institution expects an increase in interest rates, it can increase the amount of rate-sensitive assets (such as variable rate loans) relative to ratesensitive liabilities, to generate a positive gap so that the expected net interest income is increased. On the other hand, if an institution wishes to preserve its net interest income, then the gap should equal zero. (The timing of rates repricing has an important impact on NIM, for more details see for instance Toevs 1983)

During the past decades, duration has been used as a riskmanagement tool to protect the financial institution's net worth against interest rate risk[44]. The duration gap analysis is used to protect their cash flow against interest changes and repricing of assets and liabilities. On the other hand, as exposed by Redington (1952), changes in market rates impact the surplus position of intermediaries requiring the use of immunization techniques to offset the impacts on their net worth[45]. The impact on the net worth depends on the asset-liability duration gap. If the duration of assets (DA) matches the duration of liabilities (DL), the institution is immunized against changes in interest rates. That is,

$$\Delta \mathbf{NW} = \left[-\mathbf{D}_{A} * \frac{\Delta \mathbf{i}}{(1+\mathbf{i})} * \mathbf{A} \right] - \left[-\mathbf{D}_{L} * \frac{\Delta \mathbf{i}}{(1+\mathbf{i})} * \mathbf{L} \right]$$

Bierwarg and Kaufman (1985) developed duration gaps assuming a parallel shift of a flat yield curve for target accounts, such as net income and capital. They also computed the effects of changes in interest rates on target accounts (Bierwarg and Kaufman 1985:69).

They have shown that in order to calculate the impacts of interest changes in net income, the following formula can be used:

 $\Delta Net \ Income = -DurGap_{NI}NI\Delta i$ $\Delta Net \ Worth = -DurGap_{K}A\Delta i$ This means that if interest rates are expected to increase (decrease) more than the market's consensus, then a bank should have a negative (positive) duration gap to profit from the interest rate increase (decrease) (Bierwarg and Kaufman 1985, 69). The degree of confidence of the forecast will determine the size of the corresponding duration gap.

The measurement of the impacts of changes in interest rates on cash flows, and the balance sheets of financial institutions have important impacts on the decision to hedge against interest rate risk. Interest rate exposure and the expected behavior of the yield curve will lead to portfolio adjustments, and a financial institution may also use derivatives to hedge changes in future interest rates. This results in changes in the portfolio preferences of banks and financial institutions, impacting prices of financial and real assets, and the structure of market interest rates. Hence, the impact of rate changes on net interest margin and on net worth affects the demand for securities and, therefore, the price of those financial instruments.

In this regard, Brazilian regulations requiring banks to mark assets to market have changed banks' preference to bear price risk. Interest risk is significantly increased by the lengthening of the portfolio's duration. For instance, during the second quarter of 2013, the three largest privately controlled banks –Itau-Unibanco, Bradesco, and Santander- experienced massive losses, about R\$ 11,7 billion, due to a negative adjustment to the market value in their portfolio of securities, classified as available for sale caused by changes in the yield curve[46]. These positions in longer term assets show greater short-term volatility. It is, thus, a high and volatile interest rate environment, due to active manipulations of the central bank's policy rate, known as Selic rate, and the effects of mark-to-market volatility, have shifted portfolio preferences of long-term private domestic fixed income investors towards low duration, short-term assets.





Source: BCB, REF, 2014

Brazil's largest private bank experienced a 68.4 percent reduction on its financial margin with market, which is defined as treasury transactions for proprietary portfolio management and ALM purposes, due to increases in the yield curve during the second quarter of 2013, when compared to the third quarter of the previous year. It triggered the negative adjustment in the market value in the portfolio of securities available for sale, affecting capital ratios and shareholder's equity.

Figure 57: Itau financial margin with market (R\$ million)



Source: Itau company disclosures, 2014

As the benchmark Selic rate hit its lowest levels in 2012, due to the sensitivity of balance sheets, it also impacted the cash flows of financial institutions[47]. For instance, at ItauUnibanco, Brazil's largest private bank, this decline in the policy rate had a negative impact on its net interest margin with clients 12 months out, reflecting Itau's asset sensitivity gap, that is, the sensitivity of its assets to changes in the interest rate.

Figure 58: Itau Net Interest Margin



Source: Itau financial statements, 2014

Bank net interest margins tend to follow movements in the benchmark Selic rate, that is, rising (declining) Selic rate is followed by increases (decreases) in bank net interest margins. Net interest margins over the past decade have been affected by the reduction in the policy rate and, over this period, banks' exposure to interest rate risk increased. On the asset side, banks have extended the duration of their assets, and on the liability side, the sensitivity of banks liabilities to interest rate changes have increased. This was followed by increasing use of derivatives to hedge their exposure to interest rate risk. Thus, a prudent banker might not undertake increasing risks of maturity mismatches, such as financing long-term assets by issuing short-term liabilities in a volatile interest rate environment. Bankers are unwilling to be exposed to increasing maturity mismatch, particularly when the current macroeconomic policy brings about high interest volatility to fight inflation, as in the Brazilian case. This is the view of Roberto Setubal, chief executive of Itaú Unibanco, he points out that:

"[Mortgage funding] will need to be developed in Brazil, but in a different way. We will not be financing long-term assets with short-term deposits in the way it was done elsewhere in the world...Since we are facing this liquidity perspective, and let's assume mortgages will grow at 40% a year, because today they are less than 5% of the total portfolio, and let's also consider Basel III's liquidity requirements, [then] it's obvious we cannot use savings or demand deposits to close this gap. That is why there is a big discussion in Brazil about what the right funding for mortgages would be...Given the high level of interest rates, this is a problem, and this is why Brazil has never developed it before. A lot of current proposals, such as covered bonds, will help, but if we do not have single-digit interest rates it will not happen" (Caplen 2011)

High and volatile interest rates and the threat of a liquidity crisis limit banks operation in the short-end of the yield curve. It generates high interest rate risk on banks' balance sheets, changing banks' portfolio allocation preferences towards high interest rate-low duration assets. In this regard, banks hold shorter-term less volatile liquid assets to hedge their risks due to central bank policy. As a result, Brazilian bankers have shown no revealed preference for increasing interest rate risk, and limit their exposure to low duration liquid assets and short-term lending. It resulted in a plain vanilla balance sheet for the 5 largest banks in Brazil.

There has been increasing reliance on short-term noncore funding sources relative to the deposit base, to close the duration gap and avoid reserve requirements. Noncore funding, such as Financial Bills, represents an important source of funding for financial institutions, and it is more volatile and rate-sensitive than traditional deposits. The search for alternative funding instruments is an attempt to minimize interest rate risk and economize on costs imposed by high reserve requirements on traditional deposits. In this regard, Brazilian bankers are unwilling to increase the duration of assets relative to liabilities and carry this risk on their balance sheets. For instance, as of June 2010, roughly 60 percent of banks liabilities were less than one year. The average maturity of the credit portfolio has slowly increased during the past years, as outstanding mortgage debt has grown almost twentyfold since 2002. Even though maturity matching by bankers is a source of banking stability, it limits investments capital financing of in long-term assets and infrastructure-type products.



Figure 59: Maturity structure of funding

Source: FSR BCB, sep, 2010, 20

Recent efforts by policymakers directed to lengthen the duration of bank liabilities –such as the development of Financial Bills (Letras Financeiras), which have a longer maturity than core deposits to fund their operations, and are currently exempt from reserve requirements, should be seen as an asset liability management (ALM) strategy to increase the duration of banks liabilities- to match the lengthening of duration of banks assets rather than an attempt to raise a long term funding option to finance assets. Even though the conventional view of banking assumes that banks are constrained by liabilities and financing mechanisms to extend credit, the primary role of Financial Bills is to reduce the mismatch between assets and liabilities rather than source of funding long-term investment.

Figure 60: Brazilian Banks Maturity Mismatch: average maturity of funding costs and credit portfolio (years)



Source: BCB

This mistaken view of banking leads to erratic policies, such as the use of reserve requirements to constrain credit creation. The existence of remunerated and non-remunerated reserve requirements lowers the return of bank earning assets. It works as a "reserve tax" on banks. Reserve requirements in Brazil are substantially higher than international peers, and impose a significant cost on bank's operations. Moreover, it encourages banks to find alternative sources of funding to minimize the burden of reserve requirements (Rezende 2009). Contrary to normal central bank operations, reserve requirements are the main tool used by the

Brazil's Central Bank (BCB) to provide reserves to the banking system (e.g., Mesquita and Toros, 2010; Robitaille 2011). Moreover, banks have avoided the discount window due to perceived stigma. The central bank should eliminate reserve requirements, including remunerated and non-remunerated balances, and adopt a system of paying interest on reserve balances (Rezende 2009).

The adoption of the inflation target regime, combined with active manipulations of the overnight lending rate, resulted in high interest rate volatility that banks responded to, by reducing the duration of their portfolios and having a preference for working on the short-end of the yield curve. Hence, interest rate risk in banks' portfolio can be substantial if they decide to extend their portfolio maturities.

				Reserve Requirement Rates		
			Before the 2007- 2008 Global Financial Crisis	During the GFC	Current	Current Remuneration on Reserve Balances
		Reserve Requirement Additional Reserve Requirement	45% 8%	42% 5%	45% 0%	0% Selic rate
Demand Deposits	Minimum lending requirements	Rural Loan Microcredit	25% 2%	30% 2%	34% 2%	
		Reserve Requirement Additional Reserve Requirement	20% 10%	20% 10%	24.50% 5.50%	6.17% p.y. + TR Selic rate
Savings Deposits	Minimum lending requirements	Real Estate Financing	65%	65%	65%	12% p.y. + TR
Time Deposits and Repurchase Agreement (Debêntures)		Reserve Requirement	15%	14%	25%	Selic rate
		Additional Reserve Requirement	8%	4%	11%	Selic rate

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Source: BCB

Policy Recommendations

There are several areas that policy should focus to foster long-term financing. First, transfer risks to parties more able to bear them. Following Kregel (1993), different financial structures are created to provide a reduction in price risks, such as the risks associated with financing investments in long-term capital assets. In the US compartmentalized financial system, short-term project finance comes from the bank, and long-term takeout finance comes from floating the completed project in the capital market. This is where the rest of the financial system comes in. Investment bankers underwrite the floatation of the project by a primary distribution of securities in the capital market. There is no legal restriction to prevent them from being direct investors, but they usually only act as brokers between firms and investors. There is thus an implicit financial structure in which firms' short-term financial liabilities are held in bank portfolios, and firms' long-term liabilities are held in household portfolios, along with banks' short-term demand deposit liabilities.

The ability of the banks to lend to business to finance investment depends on there being buyers in the long-term capital market, to provide the funds which the firms use to repay the banks' short-term lending to fund investment. The buyers are predominantly households, who thus finance the capital stock holdings of the economy. (Kregel 1993, 3.4)

He then characterized the US financial system, which was subject to Glass-Steagall restrictions, during the pre-1970 era as a two-stage process.

system thus intermediates between firms The financial and households, in a two-stage process. This is rather different from the textbook description, which often presents the financial system as the intermediary, which makes the requirements of firms for long-term lending to fund fixed capital investment compatible with the desire of households to hold short-term liquid assets. In fact, commercial banks provide sight and other short-term deposits against secured short-term commercial and industrial lending. Investment banks short-term borrowing long-term convert into borrowing. bv underwriting long-term primary securities distributions. But since they do not normally take position themselves, there is no "natural" longterm demand for these securities, unless it comes from other banks, firms (as it is the case in many systems outside the US), or from institutions, such as insurance companies or pension funds receiving non-discretionary savings which they invest on behalf of the general public...It is thus the liquidity provided by the financial institutions operating the secondary market, not the intermediary function of financial institutions, which provides the maturity transformation by which the publics' demand for relatively short-term liquid assets is matched to the firms' requirement for permanent sources of finance (Kregel 1993 3-4).

The important question is related to the costs of carrying a mismatch between the duration of assets and liabilities on the bank balance sheet, that is, if interest and funding risks are carried on banks' balance sheets. Kregel (1993) pointed out that,

When the volatility of short-term interest rates is modest, the [balance sheet maturity mismatch] adjustment can be made by cutting back on new lending, reducing net margins and drawing down secondary reserves; this was the method of monetary control in the post-war period. When the movement in short-term rates is substantial, loans must be called and forced sales of assets may take place leading to downward pressure on prices. Such instability can be reduced in a number of ways. One is to limit maturity mismatching by institutions.

This would require a range of different institutions operating in markets for assets of different maturities, limited to issuing liabilities of the same maturity, which would imply regulation via the imposition of financial market segmentation. Alternatively, one could have an infinite number of institutions, each operating with an imperceptibly small mismatch, which could be covered by a buffer of liquid reserves. Finally, long-term assets could have interest rates indexed to short-term liabilities; this would eliminate the interest rate risk of maturity mismatching by financial intermediaries, but shifts it onto the borrower who is forced to forego the presumed preference for fixed interest liabilities. Credit risk here replaces maturity or interest rate risk. (Kregel 1993, 2).

For instance, instruments can be created for asset-liability management (ALM) purposes to allow banks to manage short-term volatility in asset prices. The policy choice to lengthen the duration of bank liabilities —such as the recent development of Letras Financeiras- is a step in this direction to match the lengthening of duration of banks assets.

Figure 61: Liability Structure of Brazilian Banks (R\$ billion)



Source: FSR, BCB, Sep, 2013

In this regard, new sources of bank funding, such as Letras Financeiras (Financial Bills), LCAs (agricultural credit bills), LCIs (real estate credit bills), DPGE, and covered bonds have been created to allow asset and liability management to better control the impact of changes in interest rate, on margin and on bank's net worth. Even though maturity matching by bankers is a source of banking stability, it limits financing of investments in long-term capital assets and infrastructure-type products. The German banking regulatory experience imposes matching between assets and liabilities on banks' balance sheets (Burlamagui and Kregel 2005), so that "banks issued long-term bonds, which were held within the financial sector, and then slowly started to be held by the public. In this way, fixed interest liabilities matched the term lending of the banks to firms, and the reliance on bond finance may be seen as a structural result of the way in which price risks are hedged in the German system, and as a substitute for the pre-war use of the equity market. The German mixed bank system is thus no less dependent on capital markets to reduce risk than segmented bank systems, both require the provision of a reduction in price risks." (Burlamaqui and Kregel 2005, p. 45).

More recently, Brazilian authorities allowed Brazilian banks to sell Letras Imobiliarias Garantidas (i.e., guaranteed real estate letters of credit, a financial instrument like covered bonds), which are exempted from reserve requirements and provide tax exemption on interest income to institutional investors, for maturities greater than two years. Though this policy initiative provides a reduction in price risk, it fails to deal with structural problems with the existing central bank policy. This brings us to the need for institutional reform.

The need for institutional reform: adjustments to existing central bank policy frameworks.

High liquidity and low volatility are the basic requirements for an asset to serve effectively as a benchmark. The characteristics of LFTs, such as lower realized volatility, have provided stability to investor's portfolios and have served as a collateral to secure financial transactions. The Basel Committee on Banking Supervision's report noted that "Brazilian banks do not have significant or complex trading books. The key source of market risk relates to Brazilian sovereign bonds held in the trading book...For exposures in fixed interest rates denominated in local currency, the BCB has developed an approach that is different from the Basel standardized approach, and built on the concept of being a hybrid between the Basel standardized and approaches. Following this approach, the modelled capital requirements are equal to the sum of a parametric VaR and a parametric stressed VaR (SVaR), where coefficients such as volatility, correlation parameters and multiplicative factor are estimated by the BCB. This is done on a daily basis for the VaR, and when necessary for the SVaR." (BCBS 2013, p.14).

The chapter assessed that fixed interest rate exposure is "is the main market risk factor in Brazilian trading books accounting for 85% of all exposures." (BCBS 2013, p.14, note 13). Regarding market risk, the report concluded that:

"The main reason given by the BCB for developing their own approach is conservatism: the Basel standardized approach was considered by the BCB to be relevant for countries with less volatile financial markets than Brazil. The BCB has then chosen to design a new methodology that is more conservative and more risk-sensitive. It has been modified to incorporate a "stressed VaR" component, which can be considered as a floor: even if the volatility of the Brazilian capital markets declines, the capital requirements cannot fall below this quantity." (BCBS 2013, p.33).

In an attempt to capture the volatility of local capital markets, Brazil's central bank approach to measure interest rate risk "is more conservative and more risk-sensitive", however, this interest rate volatility is created due to its monetary policy actions, that is, hyper active manipulations of the benchmark Selic rates, combined with its policy decision to let long-term rates to be determined by markets. Thus, the central bank's failure to coordinate the regulatory framework with monetary policy objectives has imposed higher capital requirements, thus discouraging exposure to long-dated fixed-rate securities.

If the monetary authority wants to encourage market participants to move out the yield curve, it should adopt a policy to provide investors with sufficiently low volatility. Active manipulations of the benchmark Selic rate and the central bank's political decision to let intermediary and long interest rates to be market determined, have created high rate volatility and uncertainty. One approach that can be taken is to target the entire risk-free yield curve by announcing target ceilings at bid, and ask rates for specific maturities. This policy will provide significantly liquidity and lower volatility, which will encourage market participants to increase their holdings of long-dated sovereign bonds. Moreover, central bank control of the entire risk-free yield curve "is a key element of the macroprudential tool-kit." (Turner 2014, p.8).

The recent experience has shown that declining interest rates and volatility encourage market participants to move out the yield curve, thus increasing duration exposure to their portfolios.



Figure 62: Market Participants government securities holdings by maturity (as of Jan 2007 and May 2015)

Virtually all market participants have lengthened the maturity of government securities in their portfolios; the only exception is for non-residents that increased their holdings of short-term securities relative to their position in 2007. As global major central banks have reduced policy rates towards zero, non-residents are seeking to boost their returns with relatively low duration exposure given the risk reward profile in their home country.

Periods of declining interest rate and volatility led banks to increase exposure to interest rate and credit risks. Thus, if the central bank announces target ceilings for different maturities at levels that encourage investors to be exposed to credit risk to boost their total returns, then market participants will increase the acquisition of longer-term private securities. For instance, the 10-year Brazilian government bond yield target could be set at Brazil's Long-Term Interest Rate (TJLP). In this proposal, in addition to the central bank controlling the overnight Selic rate, it would also control longer rates along the yield curve at the announced bid-ask rates. As the US experience has shown, the central bank can effectively control the entire risk-free yield curve (Turner 2013, 2014; Rezende 2015, 2011). In this framework, the BCB can adopt a policy of market forward "guidance"[48].

As Keynes observed, "a monetary policy which strikes public opinion as being experimental in character, or easily liable to change, may fail in its objective of greatly reducing the long-term rate of interest because M2 may tend to increase almost without limit, in response to a reduction of r below a certain figure. The same policy, on the other hand, may prove easily successful if it appeals to public opinion as being reasonable and practicable, and in the public interest, rooted in strong conviction, and promoted by an authority unlikely to be superseded (...) Perhaps a complex offer by the central bank to buy and sell at stated prices gilt-edged bonds of all maturities, in place of the single bank rate for short-term bills, is the most important practical improvement which can be made in the technique of monetary management" (Keynes 1936, 203-206)

Another major adjustment to existing central bank policy frameworks is using the discount window as the main tool to satisfy liquidity needs of both, depository and non-depository institutions.

As Minsky noted, "In the discount-window technique, the Federal Reserve uses paper that arises as business is financed to create reserves. The Federal Reserve both, creates a market for this paper by its purchases, and assures that it will have a protected status in financial markets. Such paper will therefore be in a preferred risk class." (Minsky 1986: 362).

If the central bank accepts as a collateral private fixed income instrument (such as corporate bonds used to finance investment in productive assets, it will have a 'protected status' in investor's portfolios. He then goes on to say that the guidance of the structure of financing relations will run from the Federal Reserve portfolio to a favored interest rate in the market for the eligible paper... Each bank should have a line of credit at the discount window, and be able to borrow up to its line at a preferred rate; borrowings above the line of credit will be at a penal rate. The bank's line of credit at the preferred rate might very well equal its capital and surplus account, thereby inducing banks that have high asset-capital ratios to retain earnings" (Minsky 1986: 362) Hyman Minsky favored the use of the discount window as secure source of funds for financial institutions. Minsky's idea was that central banking policy should, among other things, guarantee orderly conditions in financial markets (Minsky 1972: 80). He argued that central banking policy should be directed to provide a cushion of liquidity to market participants. That is, "[m] maintaining orderly conditions in some markets serves to protect position takers in the instrument traded in these markets. This protection of position takers may be a necessary ingredient for the development of efficient financial markets." (Minsky 1972: 80).

As Minsky noted, if the central bank "is willing and is able to introduce claims on itself into the economy, by purchasing such instruments and thus refinancing such borrowers, then a limit or floor price to such instruments is set." (Minsky 1986, p. 55). Moreover, if the central bank "protects a financial instrument, it legitimizes the use of this instrument to finance activity." (Minsky 1986, p. 55). In the absence of regular central banking lending facilities, then "[the central bank] will not have working relations with market participants, and it will not be receiving first-hand and continuous information as to conditions in the market." (Minsky 1972: 83). For instance, "As an alternative to openmarket operations, the Federal Reserve can furnish bank reserves by discounting bank assets. In the discount technique, bank reserves are furnished when the central bank buys or lends on specified, eligible types of paper that are a result of financing business. The Bank of England money market relations prior to World War I can serve as a model for an apt relation between the Federal Reserve, commercial banks, and money-market institutions. In this model, the reserve base of banks (as well as the currency supply) would be largely the result of the Federal Reserve's discounting bank loans (or open-market paper) that arise in the financing of short-term business activity. The preferred or eligible paper for Federal Reserve discounting would be to-the-asset paper that reflects commercial or manufacturing inventories. The discount window method for creating the reserve base induces favorable terms for the hedge financing of short-term positions, and blunts the tendency towards fragile financing structures." (Minsky 1986, p. 361)

The funding structure of the new financial architecture should be based on regular access to the central bank lending facilities. Opening the discount window to qualified financial institutions, favoring hedge financing, and eligible paper arising in financing productive capital development would decrease the need to rely on private funding markets. As Minsky proposed, financial institutions should have access to reliable and official sources of funds, such as the discount window.

In addition to setting bid-ask targets for the entire risk-free yield curve, the central bank should adjust its policy framework to lower the benchmark Selic rate to zero, that is, lower and stable benchmark interest rates will encourage maturity extension and credit risk in investors' portfolios. The recent experience has shown that pension funds and insurance companies face challenges, when interest rates remain low for an extended period of time (CGFS 2011). Moreover, a low interest rate environment has shown conflicts inside Brazil's financial system for traditional banks, mutual funds, pension funds and insurance companies. The impacts on banks is primarily through declining net interest margins, which can lead to rising leverage to sustain ROE to shareholders, and search for yield towards riskier assets. In addition, the search for yield can lead to underpricing of risk and the buildup of asset price bubbles. The reduction of interest rates inside the banking system is also limited by the inefficiency of Brazilian private banks, which have high operating costs and loan expenses, and the existence of high reserve requirements on demand, saving, and time deposits. There are two basic impacts of lower interest rates on pension funds balance sheets. On the liability side, it increases the value of their obligations. On the asset side, it lowers the yield on assets, making it difficult to meet regulatory returns.

As the financial industry has become used to high yielding real returns, during the period of low short-term real rates in 2012-2013, markets participants expressed angst about the end of high real returns. Mutual funds, hedge funds, and pension funds experience difficulties to either justify high fees and commissions, given their poor performance and pension funds could not beat their actuarial targets.



Figure 63: Pension funds quarterly returns (%)

An interest rate hike campaign was initiated combined with an increasing political pressure to raise the benchmark Selic rate, to ease inflationary fears. It reflected a sense of entitlement, reinforced

Source: Abrapp

in recent decades by government policy, to an elastic supply of default-free high-yielding government securities. For instance, as of May 2015 investment funds total assets equal R\$ 2,7 trillion and 65 percent of assets under management by investment funds are allocated towards federal public debt, while pension funds allocated more than 65 percent of their R\$ 684 billion assets towards fixed income instruments.



Figure 64: Investment Funds AuM (R\$ billion)

Source: Anbima

Figure 65: Pension Funds Total Assets (R\$ billion) - Asset composition (%)



Source: Abrapp

If the government decides to change the course of policy, that is, its reliance on high real interest rates as a policy tool, the financial industry will have to eventually adjust to a low real rate environment by learning how to proper manage interest rate and credit risks, and exposure to nongovernment instruments to boost their returns and of their clients.

Note that there is no reason to believe this process will necessarily be accompanied by an increase in investment in fixed capital assets to allow for the real development of the economy, if the liabilities issued by the private sector in capital markets are not being used for the acquisition of productive assets. A recent study by the IMF has shown that following Brazil's investment grade status, and low rates in global financial centers have pulled non-financial companies to tap international markets. They increased dollar denominated bond issuance abroad since 2008, the IMF report found "that stepped-up bond issuance was mostly aimed at re-financing, rather than funding investment projects, as firms extended the average duration of their debt while securing lower fixed-rates, reducing roll-over and interest rate risks. The shift towards safer maturity structures has come at the expense of a leveraging-up in foreign-currency-denominated financial debt" (Bastos et al 2015).

Though it has been argued that the development of long term capital market might provide a solution to Brazil's funding requirements to support productive investment, it is interesting to note that the development of the private fixed income market has not been associated with rising investment in capital assets. As traditional bank loans are still expensive, in a relatively low rate environment companies have issued securities in capital markets, and most of the proceeds were allocated towards repaying outstanding obligations. On the buy side, banks have purchased these instruments to take advantage of current capital requirements regulations and minimize loan costs.

Final Remarks

Brazil's central bank reliance on the interest rate, as the policy tool and its decision to let longer-rates to be determined by markets, have created volatility and instability in the bond market. In this regard, the Brazilian approach to bank regulation and supervision, and the central role played by monetary policy, shifted banks' portfolio towards high-yielding financial assets. The resilience of Brazilian banks seems to be more linked to a high interest rate environment, high costs of credit, and abnormally high loan spreads relative to international peers. During the declining interest rate period, Brazil's Central Bank benchmark Selic rate was reduced to historical lows and put pressure on banks' profitability, driving them to change their portfolio and liability mix as the return on traditional assets, such as high-yielding government securities, held by banking institutions declined. In this environment both, banks and the public have been trying to avoid capital losses by holding liquid assets.

There exists a strong influence of the high and volatile Brazil's central bank benchmark Selic interest rate in banks portfolio allocation. Among the legacies of past macroeconomic policy designed to reduce inflation are the belief that open trade and capital markets are required for development. As a result, though Brazil's central bank operates with a Selic rate target (see Rezende 2009), its rate-setting deliberations are strongly influenced by exchange rate movements (see Prates and Biancareli, 2009) driven by the belief it needs to attract the capital of foreign investors. The outcomes of this dysfunctional macroeconomic policy are high and volatile interest rates, and a highly volatile and overvalued real exchange rate in Brazil (see Prates, 2010, 2015), that not only have impacted banks' portfolio allocation, but it has failed to support productive investment and the domestic industry, because the returns generated by holding financial assets are greater than private rates of return, which deters investment. In addition to depressing the value of real investment, as government debt pays more than private investment, this policy made the Real a "positive carry" currency that attracted speculative capital flows (see Kregel 2009). In the latest monetary tightening cycle, the BCB has hiked the benchmark Selic interest rate to 13.25 percent, in against further aggressive move to defend the Real an depreciation[49] and presumably fight inflation.

Increased volatility has hampered the development of the longer end of the yield curve, and reduced liquidity in Brazil's fixed income market. Investors have maintained holdings of Brazilian government floating rate debt to protect their portfolios against interest rate risk. It is the price volatility caused by monetary policy in Brazil that has created a substantial interest rate risk, and a preference for instruments to insulate against interest rate movements.

In recent years, market participants have sharply increased the duration of all major federal government securities traded. A reduction of interest rate volatility since 2004 has encouraged market participants to move out the yield curve, but it also exposed them to greater price risk in the event of a sharp change in interest rates. First, traditional private banks are unwilling to be exposed to the interest rate risk by financing 30-year mortgage loans, particularly when the macroeconomic policy brings about high interest volatility to fight inflation. Interest risk is significantly increased by the lengthening of the portfolio's duration. This also hampers the development of capital markets. Second, active manipulations of the benchmark interest rate have generated instability and capital losses in longerdated securities. Much of the discussion about the development of long-term financing has been centered around the development of the Brazilian capital market, and blaming BNDES for hampering the development of the financial sector rather than emphasizing the causes of banks unwillingness to be exposed to long term credit, unusually high and dysfunctional loan spreads, and concentration on short term loans.

For multiple banks, commercial banking activities generate returns far higher than investment banking operations. The primary weakness of a system that issues long term fixed interest rate mortgage with short term funding is its vulnerability to an inverted yield curve. So, this financial architecture implicitly requires the coordination of the impacts of monetary policy on the balance sheet of financial institutions. Hold to maturity long-term investments should receive favorable terms to encourage a buy and hold strategy. Moreover, lower regulatory capital charges for long-term assets and credit enhancements by BNDES to support long term funding would provide additional incentives for institutional investors to be exposed to long-term assets.

Not only financial institutions have little incentive to be exposed to longer maturities of government debt, but they have shown no preference to be exposed to corporate credit risk. It is, thus, a high and volatile interest rate environment, due to active manipulations of the central bank's policy rate and the effects of mark-to-market volatility, that have shifted portfolio preferences of long-term private domestic fixed income investors towards low duration, short-term assets. That is, high and volatile interest rates are one of the main obstacles to the development of long-term financing.

While others have discussed the role of conventions in central bank's conservative interest rate policy deliberations (see, for instance, Modenesi et al 2013; Seabra and Dequech, 2013), providing interestrate stability is consistent with BCB's mission to 'ensure the stability of the currency's purchasing power, and a solid and efficient financial system'. So, policy should aim to reduce interest rate volatility to minimize capital losses assets of longer duration in the portfolios of the public and the banks. By controlling the entire risk-free yield curve, and by holding the Selic rate low for an extended period of time, and communicating to markets that rates would remain low, encouraged investors to move out the yield curve towards longer duration assets and increased their exposure to credit risk. This policy will substantially reduce interest rate risk in the Brazilian fixed income market. The central bank should shift its current policy by using the discount window as the main policy tool to satisfy liquidity needs of both, depository and non-depository institutions. These elements call for a major reform of Central Bank of Brazil's existing institutional framework to ensure transparency and accountability to citizens.

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Chapter 2 Notes

[1] The Selic rate is the overnight repo rate collateralized by government securities. It is the benchmark rate for monetary policy.

[2] Large holdings of government securities relative to banks' total assets have hidden the lack of access to official liquidity facilities that are required for the normal operation of banking institutions. For instance, "liquidity in the cash market for government bonds remains relatively low." Amante, Araujo, and Jeanneau, 2007, 76). There is a sharp demand for good collateral in Brazil as government securities are used for transaction between the BCB and market participants and most derivatives transactions pledge government bonds as collateral.

[3] Note that in as of October 2013 in France, Germany, Italy, and Spain, banks' holdings of domestic government bonds as a percentage of total assets were equal to 3.4, 4.5, 10.3, and 9.4 respectively (Turner 2014).

[4] Including letras financeiras do tesouro – [LFT] – financial treasury bills, bonds indexed to the Selic rate.

[5] Administrative and personnel expenses are particular high and reflects the costs associated with opening branches to attract local deposits. Brazilian banks have historically operated with low leverage ratios and high returns on equity during periods of hyperinflation and relatively low inflation. See for instance Oliveira (2009).

[6] Brazil adopts stricter regulatory criteria for loan-loss provisions, which are not tax deductible. They depend on the loan risk level assessed by banks' risk, that is, "Brazilian banks are required to make provisions for loan losses based on the initial credit standing of the borrower as soon as the loan is granted. During the lifetime of the loan, the level of provisions has to be adjusted if the credit standing of the borrower deteriorates. These provisions are not taxdeductible and will only be recognised for tax purposes once the borrower has actually defaulted on the loan. This means that Brazilian banks have a tendency to build up large amounts of deferred tax assets (DTAs). The Basel III framework requires banks to deduct DTAs from CET1 to the extent that those DTAs rely on the future profitability of the bank to be realised. However, Brazil's Law 12,838, passed in July 2013, allows banks to convert DTAs relating to loan loss provisions into a tax credit when the bank reports a loss, is liquidated or becomes bankrupt." (BCBS 2013, p.12) see for instance Galindo, and Rojas-Suarez (2011)

[7] For further details see Oliveira (2009).

[8] In Brazil's banking system, there exist both earmarked and nonearmarked loans. The government directs minimum lending requirements, so-called earmarked loans, at capped rates to certain sectors such as the agricultural and housing sectors, which are calculated by a fixed share of deposit liabilities. For instance, banks are required by law to lend at least 65 percent of their savings account balance in the real estate sector at capped rates. Failure to meet the minimum lending amount implies penalties. See for instance Lundberg (2011). [9] Payroll deductible loans are a financial innovation introduced by the Brazilian government (see for instance, Prates and Biancareli, 2009). This type of loan has lower default rates and a lower interest rate compared to other loan products such as overdraft loans and credit card loans.

[10] Secured loans refer to payroll loans, mortgage, and auto loans divided by total loans to individuals. Payroll and mortgage loans typically have low delinquency rates compared to auto loans and unsecured loans such as credit cards and overdraft credit lines.

[11] See for instance Prates and Freitas (2013) and Torres Filho and Macahyba (2012).

[12] Law No. 12,249, of July 11, 2010 later amended by the provisional measure n. 608/13.

[13] See Rezende (2015b) for further details.

[14] For more details on the bond risk premium see (Rezende 2015b and 2015c).

[15] Note that the increasing reliance on high domestic interest rates to attract foreign investments and the return of foreign capital to Brail resulted in an increasing share of Brazilian federal debt owned by non residents "these interest earnings appear as a debt item on the services, or liquid balance of payments. They represent the same threat of instability as the unremitted profits of foreign direct investments." (Kregel 1999: 35).

[16] During the New Millennium, the expectation that interest rates would decline increased the appeal of fixed rate securities.

[17] Other instruments with shorter duration include overnight deposits, short-term bond funds, term deposits, and money market funds.

[18] Note the concept of average maturity used by the national treasury discounts cash flows (principal and coupon payments) using issuance yields while duration uses market yields.

[19] To further illustrate how the interest rate environment influence portfolio decisions, since Volcker's monetarist experiment, the U.S. market experience a declining interest rate environment, which increased the appeal of fixed rate bonds. With the Fed's policy decision to reduce the federal funds rate close to zero to deal with the Global Financial Crisis and its aftermath and with the expectation that interest rates will soon rise have increased the demand for floating rate notes issued by the U.S. Treasury. As market participants fear potential bonds losses due to rising rates, floating rate notes offer protection against interest rate risk. [20] LTN is a zero coupon fixed rate security while NTN-F, which is a standard coupon-bearing fixed rate security (see table xx).

[21] Is it any surprise that the increase in fixed rate debt led to a sharp increase in demand for market-based hedges (see Costa, Nespoli, and Robitaille, 2007) against interest rate risk?

[22] It is worth noting the federal government's effort to reduce external financial fragility by repaying its external outstanding debt and by decreasing its reliance on external debt denominated in foreign currency and by reducing US dollar-indexed securities (NTN-D). By 2007, it became a net external creditor to the world.

[23] Periods of greater exchange rate volatility increase private sector demand for hedging exchange rate risk. It is worth highlighting that the issuance of dollar-indexed securities attempted to contain the exchange rate depreciation (see for instance Figueiredo et al 2002) allowing the private sector to hedge its positions. However, as the Brazilian currency depreciated this had a direct impact on the government balance sheet increasing government deficits and outstanding public debt, that is, "it was the Government and the central bank which were most exposed in foreign currencies through the issue of dollar-linked debt to both foreigners and residents, in particular to banks which used it to hedge their exposure when providing forward cover to commercial clients." (Kregel 2000: 8). With the reduction in the share of dollar indexed public debt, the government still provided exchange rate hedge through foreign currency swaps (see for instance Kohlscheen and Andrade 2013; Silva Jr. 2010). Note that as the central bank distributes all of its profits (as well as its negative results) to the national treasury, the impact of foreign currency swaps on the government balance sheet, ultimately, are operationally equivalent to dollar-indexed securities.

[24] To put it in perspective, weighted average maturity of U.S. marketable debt outstanding reached a record of 68.7 months as of March 31, 2015 above its historical average of 58.9 months from 1908 to present.

[25] A monetary tightening (easing) cycle refers to periods of rising (declining) Selic rate.

[26] Note that institutional investors can also use derivatives to hedge their exposure to various risks and to adjust the duration of their assets and liabilities. See for instance, CGFS (2011).

[27] There are alternative ways to measure the length of the marketable debt. Note that the National Treasury measures the length of the marketable debt using the concept of average maturity and average life. The first discounts both principal and coupon payments using issuance yields (as opposed to market yields as calculated in duration) while for average life considers only the principal flows of the underlying security are discounted, in which the discount rate used is the underlying securities issuance yield. (see for instance the National Treasury 2012 special report for further details on methodological differences among maturity indicators commonly used such as average term to maturity, duration, average life, and average maturity).

[28] One can use the security's modified duration (MD) to calculate its DV01, that is, DV01 = [0.01x MD x price] x one-basis point

change. Market participants often use DI futures so that their portfolios are DV01 neutral.

[29] For instance, as Brazil's Private Insurance Supervisory Office (SUSEP) minutes have shown there has been a great deal of discussion about models used to calculate the risk-free term structure of interests rate, which are then used to calculate the present value of obligations. One of the concerns is related to the volatility of market rates, which brings about volatility for the present value of future cash flows and to the balance sheet structure.

[30] For instance, at Itaú Unibanco holding its internal VaR (Value-at Risk) model used to estimate the expected maximum potential economic loss under certain scenarios and parameters such as a one-day holding period (in which the composition of the portfolio does not change) and a 99% confidence level. In addition of interest rate risk, there exists risks related to operations subject to foreign currency coupon rate and foreign exchange variation; price index coupon rates, and changes in share prices. Market risks are assessed using VaR - Value at Risk; Stress Test in conjunction with Gap analysis; Sensitivity (DV01); sensitivity to options 'greeks'.

[31] The federal government introduced a series of measures to deal with the consequences of the crisis. For further details see for instance Barbosa (2010), Ferrari-Filho and Bichara (2014), Rezende (2015), Silva and Harris (2012).

[32] Note that sovereign governments, like Brazil, cannot become insolvent on liabilities denominated on its own currency, that is, solvency risk is not an issue (Rezende 2009). Thus, this section

refers to inherent risks associated with long-dated sovereign securities. For instance, in addition to duration risk one must take into account curvature, volatility, and inflation risks.

[33] IMA-General is the weighed average of IRF-M (index of all fixed rate bonds outstanding, e.g. LTN and NTN-F), IMA-S (floating rate index), IMA-C (NTN-C) and IMA-B (index of all inflation-linked bonds outstanding (NTN-B).

[34] Note that there are alternative ways to measure the bond risk premium. The most commonly used are the following: yield curve steepness, using term structure models, and survey-based. Note that yield curve steepness estimates the BRP with noise since it reflects future spot rate expectations plus the required bond risk premium. See Rezende (2015c) for further details.

[35] Note that for bonds funds with different maturity/duration characteristics excess returns are also influenced by other factors such as capital gains or losses, low liquidity. Disentangling these effects from historical excess returns over government securities

[36] Note that differential taxes can also influence credit spreads, however, among other things, to be eligible for this tax benefit the bond issued cannot be indexed to the interbank deposit (DI) rate.

[37] Followed by IDI index option contract, and forward rate agreements.

[38] See Prates and Farhy (2015) for further details on foreign exchange derivatives.

[39] See for instance Pereira da Silva and Harris (2012) and Soares and Barroso (2012).

[40] The report also notes that "foreign banks operating in Brazil are the main counterparties of leveraged fast money accounts implementing unfunded carry trades through offshore NDFs. These banks typically hedge their BRL exposure in offshore NDFs by taking a short position in USD futures at BM&FBovespa, which is settled in BRL. Domestic banks, and to a lesser extent corporates, are also active in the derivatives markets and carry trades." (BIS 2015, p. 12)

[41] For further details about BCB's interventions on the foreign exchange market see Prates (2015).

[42] This is not to say that it is the only risk that banks face. There are various sources of interest rate risks such as basis risk, yield curve risk, repricing risk, reinvestment rate risk, option risk, etc.

[43] Toevs (1982, 30-31) develops a model that simultaneously protects the net interest margin and the net worth.

[44] See for instance (Toevs 1983; Bierwag, Kaufman and Toevs 1979, 1983; Bierwag and Kaufman 1985). The literature focuses on the impacts of interest changes (and changes in the term structure of

interest rates) on the net interest income of financial institutions (see for instance Bierwag 1987 and references therein and Staikouras 2006 for a review of the theories and literature on interest risk management).

[45] The basic immunization strategy protects an investor against interest movements only if is expected a parallel change term structure of interest rates. For a proof of the immunization condition see (La Gradville 2000, 149-164). More advanced models are needed to account for non-parallel changes in market rates across maturities (see Fisher and Weil 1971; Bierwag 1977; Bierwag and Kaufman 1977) such as single- (Cox, Ingersoll and Ross 1979) and multi-factor immunization models, key duration (Ho 1990 and Reitano 1990, 1991).

[46] According to BACEN Circular 3,068/2001 the securities portfolio is classified in three categories: trading securities, available-for-sale securities, and held-to-maturity securities. Depending on how they are classified, gains/ losses should be matched against the P&L for the period or recorded as income or expense. According to BACEN Resolution No. 3,464 of June 26, 2007, and Circular No. 3,354/07, of June 27, 2007, and the– Basel II the Trading and Banking portfolios, CVM Instruction No. 475 of December 17, 2008.

[47] Against this background, banks have been focusing on feebased revenue sources and attempting to improve operating efficiency to boost profitability.

[48] For further details on Fed's use of forward guidance see Rezende (2015, 2015c) [49] The real is facing pressure on several fronts from widening current account deficits to increased perception that global interest rates will soon rise.

3. Long Term Corporate Financing in Brazil – Is Brazil Becoming "Normal" ?

Ernani Teixeira Torres Filho and Luiz Macahyba

Introduction

The Brazilian long-term credit market was regarded as small and shallow for many decades after the World War II. These characteristics were considered two of the main hurdles of the Brazilian economic development. Other emerging countries in Asia and in Latin America also shared these same limitations at that time. This was different from how financial markets already worked in industrialized countries, where private credit for longer periods was abundant, intermediated by capital markets in the US or by banks in Europe or Japan.

Since the 1990's, the profile of the credit markets in many of the most important emerging markets (Agnoli and Vilan, 2008; IADB, 2005; Borensztein, 2008) has rapidly changed. National treasuries, as well

as large local companies, started issuing long term bonds denominated in local currency. This was a consequence of important macroeconomic and institutional changes and, particularly in Latin America, of the reintegration of the region to the international financial system, after the external debt crisis of the 1980s and 1990s.

In this scenario, Brazil was a laggard country. Those reforms took place later than in other countries of the region, such as Colombia, Peru or Chile. High inflation came to a halt only in 1994. Fiscal and exchange rate stability had to wait until the initial years of the next decade to become a reality. Only then, local financial markets started to grow steady and at high rates at the same time, as the real interest rates declined and the average maturity of the corporate debt rose.

The Brazilian long-term credit market was positively affected by the financial reforms introduced from 1994 on. The public debt decreased when compared to GDP, and was dedollarized as the Brazilian government became a net creditor in foreign exchange. The average maturity of the public offers of treasury bonds was extended from 2.8 years in 2002 to 4.2 years in 2013 (Tesouro Nacional, 2014). The public bond and the exchange markets were restructured in order to provide more liquidity and more confidence to investors, along with the creation of a term structure of the interest rate.

After 2004, the banks began providing mortgage loans for families, for maturities up to 15 years or more, and loans for the acquisition of automobiles reached 8 years. The bond corporate market [50] also grew, following the modernization of the public debt market. Private funds, although still scarce and costly, became more and more available.

The long term corporate credit market is supplied by three sources of funds. The main source is the loans provided with funds from the development bank – Banco Nacional do Desenvolvimento Econômico e Social (BNDES). Half of them is loans which are extended directly by BNDES' and the rest – indirect operations - is long term credits extended by commercial banks, and refinanced with the development bank. This funding is earmarked by the government. It is long-term – average maturity is over seven years – and priced according to the TJLP rate – Long Term Interest Rate or "Taxa de Juros de Longo Prazo" – which is fixed every quarter by the government.

The second source is the funds of the banks used for the acquisition of non-financial corporate bonds debentures. They are a special form of loan extended by the commercial banks with their own funds (treasury operations). The third source is the money invested by families and institutional investors in debentures. Those funds are priced according to the Central Bank basic interest rate (SELIC), although indexation to the main price consumer index (IPCA) has increased in the last few years. Their maturity ranges from two to seven years, but it may reach over ten years.

Those three sources of funds, although their singularities, operate in a harmonized way. They have different focus, transactional costs and tax incentives. They are combined to provide the most efficient options for the banks and their clients. The commercial banks have a leading role in the market. However, the BNDES is a decisive agent when the credit is related to fixed investments and involves a large amount of money, or needs very long-term maturities.

In this chapter, the Brazilian long term corporate financial markets will be assessed by three different perspectives. The first is comparing its size with other relevant countries. This dimension illustrates the aspects of the local financial development as part of a global integrated system. The second is following the evolution of the long term corporate market in Brazil and of the financial system as a whole. This will allow us to examine the recent evolution of corporate debt with the other components of the domestic credit market. The third shows light on the sources of long term funds for corporations, and on their main providers and managers. This is a way to identify the role of different investors on the decision-making process.

This chapter is organized as follows. Its first part gives an overview of the bank credit market after the 2000s. This was a period in which the Brazilian market had grown at very fast rates and, differently from the past decades, where it had not shown any real signs of instability. The private banks took a leading position in the beginning of the cycle, but lost ground to the state-owned banks after the 2008 Financial Crisis because of their countercyclical role.

The second part deals with role of the development bank BNDES, in the long-term market. It is a very large bank which is mainly funded by the National Treasury, directly or by means of government Special Funds. Its loans are long term and indexed to a special rate, the TJLP, which is fixed by the government, independently from the basic rate of the Central Bank. BNDES loans are earmarked to fixed investment projects of non-financial corporations. Half of them are lent by BNDES directly, and the rest is lent by the commercial banks and later refinanced with the development bank. There is a long tradition of information and risk sharing between BNDES and the other banks.

The third part analyses the corporate bond market, which has rapidly grown after 2004. This was not a result of a traditional disintermediation process, as it was seen in many other countries. It was part of a strategy of the commercial banks to lend more efficiently, in terms of cost and regulations, by means of acquiring debentures from their clients instead of holding their long-term loans on their own books. After 2008, families and institutional investors started buying a small part of the offers, particularly those which were exempted of income tax.

The fourth part gives a picture of the long term corporate credit market in Brazil. It has reached 16% of GDP in 2013. BNDES is the main source of funding, with 70% all credits outstanding. However, the commercial banks command 70% of the market, as they manage their own funds, plus half of BNDES credits and almost all of the funds of households and institutional investors which are allocated in debentures.

Policy recommendations and conclusions are the main issues of the last two parts of the paper. They focus on the regulatory changes that should be implemented in order to boost the access of households and institutional investors, and the offers that are open to all investors, the registered ones. Families will be the basis of investors of a secondary market in the future. They, along with pension funds, will increase competition and the size of the market, while lowering the spreads. BNDES will hold an important position in the market in the long run, but commercial banks and other private investors will have a larger share of the market in the future. The speed of these changes will depend heavily on the course of the Central Bank interest rate (Selic) and the BNDES rate. Whenever the Selic will be set on a low basis - under two digits - for a long period, and its difference to the BNDES rate is minimum, the companies will be encouraged to issue directly to the families and the institutional investors, which will be willing to increase the yield of their portfolios.

1. The Bank Loan Market: An Overview

Until the beginning of the 2000's, Brazilian credit market was characterized by five salient features. The first two were scarcity and high volatility. The evolution of the bank loans and the corporate bonds illustrate those two aspects. Between the beginning of 1996 and the end of 2004, the total bank loans to GDP fluctuated between a minimum of 24.3% and a maximum of 33.3%. The average was 27.5%. This was a low level, compared with the figures of other countries, particularly industrialized nations.

The third striking feature of the Brazilian credit was the high cost. Throughout the 1990s and 2000s, interest rates were maintained at very high levels in nominal, as well as real terms. For example, the Brazilian Central Bank's basic rate (Selic) accumulated in 12 months held, from 1995 to 2008, a difference of 12 percentage points ahead of inflation, on average.

The fourth characteristic was the high concentration on a small number of financial institutions, and the large participation of stateowned banks. From 1995 to 2014, the participation of the 10 largest banks in the total assets of the banking industry increased from 71% to 86%, as a result of consolidation and concentration. After the 2008 Crisis, the share of state-owned commercial banks in the total loans grew from 34% at the beginning of 2008, to 54% by the end of 2014 (Banco Central do Brasil, 2015).

Finally, the last major feature was tight regulation. Credit operations financed with funds raised through the classic market instruments - time and savings deposits, for instance- were severely controlled by

the Central Bank through traditional instruments of liquidity management. Reserve requirements are 45% for demand deposits, and 20% for time deposits. Banks have to follow capital to loans requirements that are higher (11%) than the levels of the Basel Accords (8%). The maturities of the loans were also affected by banking regulation and by tax incentives. Thus, the average term of these operations was always short and volatile, since they used to vary, according to anti-inflation policies or to domestic adjustment to external shocks (Torres and Macahyba, 2014).

Since 2004, some of those striking features are no longer present. According to the World Bank (2015), Bank credit to the private sector reached 63.5% of GDP in 2011. This figure was much above the world average of 37.6%. This is a higher level than seen in other major economies in Latin America (Mexico, Argentina and Colombia). The exception was Chile with 65.5%. It is, however, well below the percentage observed in higher-income countries (93%), and even in emerging nations, such China (121.5%). Credit to the private sector in Brazil was 27.1% of GDP in 2004, and since then it has grown by 16.4 % per year in real terms. This trajectory did not give in, not even during the International Financial Crisis of 2008, having been supported by the demand from companies and households. As a result, scarcity is no longer a dominant phenomenon, although there are still some supply constraints in specific segments. Volatility has disappeared (Figure 1)

Figure 1: Private Credit by Deposit Money Banks to GDP (%)



Source: World Bank (2015)

The rapid expansion of bank lending in recent years was mainly sustained by strong decompression in the household sector. Families debt initiated the expansionary credit cycle, and had grown quickly and steadily since 2004. The indebtedness of Brazilian families would not budge even during the global financial crisis. As a result, one can see in Figure 2 that the ratio of credit to households, compared with the GDP, increased from 5.8% to 15.9% between 2004 and 2014. The same phenomenon can be seen in the housing market. Despite being a very small portion of the market, around 1.5% of the GDP by 2004, loans for properties grew in leaps and bounds. Since then, it has increased six-fold, reaching 9.8% of GDP at the end of 2014.

Figure 2. Outstanding Bank Loans for Corporations, Households and Housing (in % of GDP)



Source: Banco Central do Brasil, 2015

The decompression of the households and the housing sectors were stimulated by different factors. From the supply side, the main reason was that the banks were low leveraged and well capitalized. This rapid growth would not have been achieved if the banks had not fully recovered from the years of economic crisis of the 1980s and 1990s, and if the new regulatory framework was not robust enough to avoid the deterioration of credit standards, or the start of financial bubbles. Since 2004, the banks introduced many new financial products for families.

From the demand side, as real wages increased and the unemployment rate reached very low levels, consumers become more confident about increasing their indebtedness. At the same time, the Central Bank cut interest rates, which made installments more affordable to families, many of which were accessing bank credit for the first time. Institutional innovations like payroll loans also helped decrease the risk aversion of banks.

Corporate loans also grew fast, but at a slower pace. The expansion of the corporate loans started later, in 2006. The total corporate loans increased from 15.4% of the GDP in January 2006, to a peak of 30.8% in December 2014. Differently from the household or the housings sectors, there was no strong "diffusion of new financial products" and growth was concentrated in two periods: from August 2005 to December 2008 - from 16.3% to 24% of GDP - and from January 2011 to December 2012 – from 24% to 28.2% of GDP (Figure 2).

The first surge had three main motivations. The first one was the rapid increase in economic activity starting in 2005. The sharp recovery and subsequent devaluation of the exchange rate - the second factor - explains the behavior of export related operations. Finally, the most important reason was the liquidity preference of corporations as a response to the uncertainty generated by the international scene. The experience accumulated by Brazilian companies over two decades of economic instability showed that high levels of cash was the best way to face any turbulence, if the crisis deepened (Torres and Macahyba, 2012).

This behavior is demonstrated by the liquidity and debt indicators of non-financial corporations. According to the consolidated balance sheet data for 311 public companies, in the period extending from the third quarter of 2007 - when the surge stated - until the third quarter of 2008 - when financial crisis hit the markets - these companies increased their cash holdings by 50%. Their total debt increased, but not the net debt. Thus, while the net balances of these companies

increased from R\$ 122 billion to R\$ 189 billion, net debt remained stable at around R\$ 75 billion.

From the supply point of view, the rapid growth of the credit market in the first surge was led by the local private banks (figure 3). They were liquid and capitalized enough to match the demand. The state-owned banks lagged behind. They were financially healthy, but too slow to introduce new financial products in time to compete with the private sector. State-owned banks and their local private competitors held almost the same market share in 2004. In September 2008, the difference for the private banks reached four percentages point of GDP.

Figure 3: Outstanding Loans by Ownership of Commercial Banks (In % of GDP)



Source: Banco Central do Brasil, 2015

Lehman's bankruptcy had an important impact in the domestic credit market. Although the Brazilian private banks were not exposed to foreign assets, they became more cautious, and decided to curb the rate of expansion of their loans. Actually, the rate of growth of nonearmarked credit fell from 46.5% per annum in October 2008 to just 1.0% at the end of 2009. (Banco Central do Brasil, 2015). In the beginning, this was led by uncertainty related to the derivative and credit operations of some large export oriented companies. Due to the sharp devaluation of the Brazilian currency, no bank knew for sure how much the loss of their clients would amount to, and how that would impact its own balance sheet. Liquidity in the interbank market dried up, and the Central Bank had to intervene to save the smaller banks from a severe liquidity shortage. Export credit lines became scarce and had to be substituted by new lines from the Central Bank and from BNDES.

In the last quarter of 2008, the state-owned banks began to compensate the "sudden stop" of their private competitors, and expanded their operations aggressively. They saw the crisis as an opportunity to recover part of the market share they had lost along the last five years. They increased their loans in the markets they were already relevant, and started offering new financial products in new areas, like auto loans. In the corporate sector, BNDES had a particular role compensating the shortage of short and long-term funds from the local banks, as well as from the international market. This reversed the trend of the credit market in favor of the state-owned banks (Figure 3). Different from the first surge, the second one was led by the state-owned banks, with the support of earmarked funds (Figure 4).

Figure 4. Growth of Corporate Bank Loans by Source of Funding in 12 Months (In percentage points of GDP)


Source: Banco Central do Brasil, 2015.

2. The Role of the Development Bank (BNDES)

The Brazilian Development Bank (BNDES) is a state-owned bank which manages the long term earmarked credit system for investments in industry and infrastructure. It is one of the largest development banks in the world. In 2013, the loans disbursed by BNDES amounted more than four times the World Bank's, even though total assets for both banks were similar (see Table 1).

Table 1: Main Financial Indicators of BNDES, Inter-American Development Bank and World Bank (In US\$ million)

ltems	BNDES 2013	IADB 2013	World Bank 2013
Total Assets	333,835	97,007	324,367
Equity	25,880	23,550	39,523
Net Income	3,479	1,307	218
Disbursement	81,285	10,558	16,030
Capitalization (%)	7.8	24.3	12.2
ROA(%)	1.1	1.4	0.1
ROE(%)	14.5	5.9	0.6

Source: BNDES, 2014b.

BNDES is the largest provider of long term funds for the corporate sector in Brazil. The development bank lends through two different channels[51]. The most important one is directly. These loans are extended by BNDES, and the risk is held in its books. The second channel is indirectly. A financial intermediary – usually a commercial bank - structures a loan to one of its clients, hold the risk it in its books and refinance it with BNDES. Most of these loans has to be related to specific fixed investments and must have the same financial terms in the asset and in the liability side of the intermediary, except for a markup over the cost of the funds.

According to Figure 5, direct operations hold a larger proportion of BNDES' outstanding loans, but the difference from the indirect operations is very narrow, around 1.5% on average, and the market shares are quite stable. The two channels, however, rarely compete with each other. There is a rule that fixes a boundary between them. Loans that amount under R\$ 20 million (US\$ 7.5 million) are extended by the commercial banks. The rest is extended by BNDES[52].

Because of this "division of labor", the volume and the maturities of the loans of the two modalities are quite different. The number of indirect operations was close to 1 million in 2013, and their maturity usually is set from 5 to 7 years. The number of direct operations was estimated in 50.000 in 2013 and it may reach 25 years of maturity, although it usually ranges from 7 to 15 years.



Figure 5. Outstanding BNDES Loans: Direct and Indirect Finance (%)

Source: Banco Central do Brasil, 2015

BNDES has always been the leading bank of long term lending in local currency in almost all the major sectors, except housing. According to Torres and Macahyba 2012, the development bank concentrated in 2009 more than two-thirds of all bank loans over 5 years. In July 2014, more than 20% of all the bank loans in Brazil

were funded by BNDES. This participation, however, had not been stable over time. For example, BNDES's share in the total credit fell sharply between late 2004 and mid-2008, a period of rapid growth of the credit market. It dropped from 21.9% at the beginning of 2005 to 15.7% at the end of the first half of 2008 (Figure 6).



Figure 6: BNDES Loans to Total Bank Loans and to GDP (In %)

Source: Banco Central do Brasil, 2015

However, BNDES's loss of market share was not due to competitive pressure from other banks. It was mainly a consequence of the slower pace of demand to finance productive investments while household and housing credit were booming. The funds that are managed by the development bank are earmarked for the acquisition or the exporting of machinery and equipment, for the construction of new plants, or for the building of infrastructure works. Thus, the boom in household and housing demand for credit in recent years had no direct impact on the performance of BNDES. Another factor that affected the growth of credit from BNDES in recent years was the role this bank played in the countercyclical policies. As witnessed during the crisis of 2008, BNDES helped sustain investment and offset the credit crunch from the domestic and foreign private banks. As it can be seen in Figure 6, the participation of BNDES in the total bank credit increased at a fast rate, from 15.6% in August 2008 to 21.1% in the same month of 2010. In that period, the total of its loans to the GDP jumped from 6.0% to almost 9.3%. Special Funds from the National Treasury (SF), such as PIS–Pasep and the Workers' Assistance Fund (FAT), used to be the main sources of funds for BNDES until 2008 (Figure 7). They supply loans to the development bank on a concessional basis: very long periods and charge TJLP, interest rates which are lower than the Central Bank rate (Selic). The SFs are supplied by compulsory contributions from corporations, which are very stable.



Figure 7: BNDES's Main Sources of Funds (in %)

Source: BNDES, 2014b.

Since 2008, the Treasury took the position of leading supplier from the SFs. In order to compensate the impact of the international financial crisis of 2008, BNDES needed large amounts of money in a very short period of time, to play a relevant countercyclical role in the credit market. However, as the supply of the SFs is very inelastic, the National Treasury had to step in and issue large volumes of debts in order to give massive new loans to the development bank.

BNDES could have instead sold its own bonds to private investors, but this market was not large and deep enough to supply the large amounts needed at the appropriate time. The Central Bank could have been another possible buyer for those bonds, but that would have had a negative impact on monetary policy and in the expectations of the financial market. The public debt was the only local financial market that, after the 2008 crisis, was large and deep enough to supply the large amount of money needed by the development bank[53]. Due to this strategy, the National Treasury, in the beginning of 2010, became BNDES's main supplier of funds. From 2007 to 2010, the federal government participation in the total sources of the development bank increased from 6% to 46%. In 2012 and 2013, they reached 53%. In the meantime, the share of the SFs decreased to 27%.[54] Therefore, the strategy to fund BNDES with Treasury loans was also a response to structural limitations of the domestic bond market.

As the development bank is 100% state-owned, there was no legal impediment to make direct loans from the Treasury. This mechanism already existed since the 1970s. The difference was that until 2008 it was not used on a regular basis, and the amounts of money involved were much smaller.

3. The Long Term Corporate Bond Market

Until the 1980s, the United States was the only country to have a relevant private bond market. This was mainly due to the characteristics of the financial regulation adopted in that country from the 1930's on a strict segregation between the activities carried out by commercial banks - short-term loans - and by other financial institutions - long-term credit, intermediated by the capital markets. This regulatory framework was very different from the models adopted in other advanced countries. In Europe and in Japan, as an example, long term credit was intermediated by universal banks[55]. Their capital markets were not so important as in the US.

The globalization of the financial markets had a deep impact in financial markets. One of the most important changes was the disintermediation of credit as capital market operations became more accessible and less costly for corporations. In Japan, some important reforms were adopted after the 1970s, to develop the local bond market. Japanese government and financial institutions wanted to bring back to Tokyo brokering bonds in yen, that large companies and banks were already issuing abroad. Europe had a later development due to the importance that banks have always had in financing services in that continent. Corporate bond markets had grown faster since the start of the euro in 1999. The process of financial liberalization, that followed the introduction of the single currency, led to more competition and flattened intermediation spreads.

Table 2. Outstanding domestic private debt securities to GDP (%)

Country	1990	1995	2000	2005	2011
United States	68.2	77.2	94.6	105.7	91.9
South Korea	27.9	37.0	50.7	53.0	59.3
Malasia	18.2	30.5	32.8	47.4	58.1
France	49.4	45.6	34.2	38.3	56.3
Japan	38.5	41.9	48.1	41.0	37.2
Germany		52.5	57.1	34.9	24.0
China	3.3	2.5	7.1	10.7	23.1
Brazil		8.3	8.4	12.7	21.7
Mexico	1.3	1.2	9.8	13.9	15.7
Chile					14.8
U.K.	12.8	12.9	18.3	15.1	12.3
India	0.3	1.0	0.4	0.9	4.9

Source: World Bank, 2015

In Asia, local corporate bond market expanded more rapidly from the mid-1990s onwards, in countries like Malaysia and South Korea. In both cases, the Asian Crisis of 1997 deeply affected the ability of local banks to extend credit. As a reaction, companies started issuing bonds in the local financial market. In India and China, this trend became more visible in recent years.

The development of corporate bond markets in Latin America has in general been later and slower than in the advanced countries and in Asia[56]. Only in the 2000s, the region completely recovered from the long period of high inflation and scarcity of external liquidity. The crisis of 2008 gave new impetus to the Latin American corporate bond market. The bankruptcy of Lehman Brothers closed the access

of the large companies in the region to the global financial market. However, despite the crisis, some Latin American capital markets remained open for new placements in local currency, by companies which were well rated. Institutional investors, particularly pension funds, played an important role in sustaining the demand for private papers Latin Americans. In the middle of the last decade, these institutions held 80% of all such emissions in countries like Chile, Colombia and Peru.

Differently from what happened in industrialized and in some emerging countries, Brazil still has a very shallow and limited long term credit market. This specificity can no longer be easily explained by "structural factors inherent to developing economies" or by "particular economic conditions that are shared by Latin American countries". The reasons why Brazil is still a late comer have to be searched in the characteristics of the development of its own local financial markets.

According to Table 3, the Brazilian non-financial corporate bond market only grew fast after the second half of the 2000s. It increased from 6.6% in 2006 to 13.1% of GDP in 2014. The data also shows that this trend was not followed by proportional issuance from financial corporations or the Treasury. This picture could indicate that Brazil was, at last, following the international trend. Corporate private debt was rising at fast rates, and banks were losing ground for capital market operations.

 Table 3. Brazil: Outstanding Domestic Financial Assets (In % of GDP)

Financial A	ssets	2006	2007	2008	2009	2010	2011	2012	2013	* 2014
Non [Financial Corporate Bonds 1	Debentures	6.6	7.9	8.2	8.7	9.0	9.6	11.6	12.0	12.8
	Others	0.1	0.1	0.6	0.5	0.3	0.3	0.2	0.3	0.2
	Total (a)	6.6	8.0	8.8	9.2	9.3	9.9	11.8	12.2	13.1
Financial Corporate - Bonds	CDs	14.5	14.9	24.1	25.6	22.6	18.2	14.8	13.2	11.0
	Bonds	0.0	0.0	0.0	0.0	0.8	3.6	5.4	7.0	6.8
	Others	0.1	0.3	0.2	0.6	1.5	0.7	0.7	0.6	0.6
	Total (b)	14.6	15.2	24.3	26.2	24.1	22.5	20.9	20.8	18.4
Corporate I	Bonds (a+b)	21.2	23.2	33.1	35.7	33.4	32.4	32.7	33.0	31.5
Covered Bo	onds(c)	1.2	1.0	1.4	2.3	2.6	3.3	4.6	6.1	8.1
Private Bonds (a+b+c)		26.3	22.3	24.6	35.4	38.0	36.6	37.0	38.8	41.1
Public Bond	ds (d)	54.5	46.1	46.0	41.7	43.2	42.5	43.0	43.6	41.9
Total (a+b+	c+d)	80.8	68.4	70.6	77.1	81.1	79.2	80.0	82.4	82.9

Source: ANBIMA, 2014 (*) Figures for September 2014,

However, the aggregate data tends to underestimate the role that the banks have had on the expansion of the corporate bond market. According to Figure 8, between 2005 and 2008, the rapid expansion of debentures was mainly due to the issuances of the leasing industry. These companies, which at large belong to financial conglomerates, were only a way for their owners - the banks - to access the debenture market as financial institutions are forbidden to issue debentures in Brazil.

Figure 8. Outstanding Debentures (In % GDP)



Source: ANBIMA, 2014

Almost all of the debentures issued by leasing companies were bought by the banks of the same conglomerate. After receiving these funds, the leasing company relent them back to their owner's bank through the interbank market. In fact, it was only a booking operation within the same financial conglomerate, with the only purpose to originate a security that could be used to carrying out "reppo" operations between the banks and their clients. The debenture of the leasing company replaced the traditional Certificate of Deposit issued by the banks. The reason for that was to avoid the taxes and the reserve requirements that affected CDs, but not the "reppo" of debentures, which were supposed to be "long term securities". Therefore, the fast growth of the corporate bond market in Brazil in the second half of the 2000s was not a real development of the nonfinancial corporate bond market, but just a way for the banks to intermediate funds on a more efficiently. From 2008 onwards, the outstanding of leasing debentures to GDP has been almost flat. The reason was that the tax and regulatory arbitrage between CDs and debentures almost disappeared for two reasons. First, repurchase agreements with debentures of leasing companies became subject to reserve requirements. Second, long-term bond of the banks – called "Letras Financeiras" - were exempted from reserve requirements by the Central Bank. The aim of those measures taken by the government was to make the banks stop using the debenture market as a way to fund themselves.

Since then, the expansion of the debentures market was driven by non-financial corporate issues. The stock of securities of these companies rose from 1.9% of GDP to 4.6% in 2013. In order to access this market, the companies have to hire the service of the banks to structure and distribute their bonds. However, instead of simply copying the model adopted in the international markets, Brazilian banks also provide firm guarantee, acquire most of the bonds issued and hold them to maturity. The money from the sale of the debentures is used to repay the short-term debt of companies with the bank, which at the same time releases new short-term credit lines on the same amount.

The main reason for this behavior is again arbitrage. The acquisition of debentures is the best way for banks to lend large amounts of money for corporations for longer periods. It avoids the payment of IOF, a transaction tax, which is only applied on bank loans. Besides that, corporate bonds are also more flexible to allocate than loans. They can be easily sold and bought, and therefore be easily transferred within different portfolios managed by the financial conglomerates - investments funds, treasury operations, etc. So, the recent boom of the non-leasing debenture market in Brazil, as the one before, is not a real disintermediation process. It is just a more efficient way to extend longer term bank loans using a security instead of a contract. It is different from the earlier one because it has not been driven by arbitrage between the different ways the banks can fund their own operations. However, it is still mostly a consequence of tax incentives which affect the way banks extend credit to corporations.

The importance of the banks in the debenture market has a large impact on the composition of the demand for this asset. In Brazil, differently from other countries, the banks are the main holders of long term corporate bonds. In August 2013, they had 79% of the outstanding of debentures in their portfolios (Figure 9). In the rest of the world, this position is taken by institutional investors, such as pension funds and insurance companies.



Figure 9 - Demand for Debentures in August 8, 2013 (In %)

Source: ANBIMA, 2014

In 2010 and 2011, the government again tried to reform the debenture market. This time, the aim was to stimulate private long-term funding from local families and foreigners for investment projects in infrastructure. A new law created the "infrastructure debentures" or "debentures 12431"[57] and guarantees income tax exemption if this asset is held by families or foreign investors. To be eligible for this tax benefit, these debentures must have different financial characteristics from the bonds that are usually sold or bought by banks. Interest rates cannot be indexed to the interbank market rate (DI), the minimum average maturity is four years and repurchased agreements are forbidden within 24 months following the launch. Moreover, the issuer has to allocate these funds in specific investment, mostly energy infrastructure projects, already approved by the government.

By December 2014, there were 14 of these "infrastructure debentures" totaling R\$ 14.8 billion. Of this amount, US \$ 5.0 billion was allocated exclusively to non-residents and were privately placed. In fact, they were just a way for foreigners to avoid paying the income tax on interest, which is applied to any kind of loan from overseas, except if intermediated by "debentures 12.431".

There were also 46 issuances, totaling R\$ 9.8 billion, for local investors. The power sector originated most of these operations, followed by highways. The maturity of the operations reached up to 17 years, which shows that these bonds have more suitable to funding investment projects.

4. Long Term Corporate Financing in Brazil: What are the news?

Brazilian credit market has grown very fast in the last few years. The long term corporate credit market is one of the dimensions of this process. As a late comer, the Brazilian experience is not just a copy of the more advanced countries. As usual, this process has many singularities due to the actions and interests of the different local agents that operate on it.

From the demand point of view, Brazilian corporations seems to have a behavior which is similar to what is observed in other developed and emerging countries. According to Figure 10, Brazilian nonfinancial corporations follow a very stable pattern in terms of long term funding.

The retained earnings are their main source and had supplied on average 45% of their demand for long term funds along the period 2002-2013. The only exception was in 2009 because of the global financial crisis. The second main source of long term funding is BNDES, with 27%. This figure includes both, the development bank's direct loans and the ones refinanced by the commercial banks. Cross-Border funding holds the third position with 12% along with corporate bonds. The issuance of shares is the least important source of funding, with 4%.

This means that the Brazilian long-term credit market is led by the banks, and not by the capital markets. Therefore, it is more similar to the models adopted in Europe and Japan. What is specific in the Brazilian experience is the large size of the development bank (Zysman, 1983).

Another interesting picture of the Brazilian long-term credit market comes out of the combination of data of Figures 9 and 11, for the different source of funds of long term credit for corporations[58]. Unfortunately, this is only available for the year 2013. The results are shown in Table 4

Figure 10. Source of long-term funding for corporate investments in industry and infrastructure (%)



Source: BNDES, 2014b.



Sources	GDP	Total
BNDES Direct Op.	5.8	36.1
BNDES Indirect Op.	5.6	34.9
Banks ex Leasing	2.3	14.1
Investment Funds	1.7	10.5
Others	0.7	4.3
Total	16.0	100.0

Source: BNDES and ANBIMA

In 2013, the size of long term credit market in Brazil reached 16% of GDP. From this amount, 71% was funded by BNDES, half of which was on its own books. The other banks held the other half of BNDES loans plus a portfolio of debentures, which amounted 14% of all long-term credits for non-financial corporations. Investment funds held 10%. These vehicles gather the savings of families, non-financial corporation and institutional investors[59] but are mostly managed by banks. The rest (4%) includes the debentures which are owned directly mostly by pension funds and families. Therefore, from the funding point of view BNDES is the central pillar of the corporate long-term credit market in Brazil. However, its almost monopolistic position of the past is little by little being challenged by two new groups of investors, the commercial banks and the large investors such as pension funds and rich families.

This same data could be rearranged to make clear the structure of the long-term credit market in Brazil from a different perspective: what amount of funding is commanded by the different agents (Table 5). We estimated that 70% of the total portfolio of the investment funds are managed by the banks, and 30% by independent managers.

Commanding Agent	In % of GDP	In %
BNDES	5.8	36.2
Other banks	8.8	55.0
Non Banks	1.4	8.8
Total	16.0	100.0

 Table 5. Commanding Agent over long term funds

Source: BNDES and ANBIMA

Table 5 shows that although BNDES is the largest provider of long term funds, the commercial banks are much more important in commanding the extension of these credits than the development bank. The commercial banks manage their own funds, the resources from the investment funds and half of the portfolio of the earmarked operations of BNDES.

These results also indicate that in fact the leadership in the long term corporate market in Brazil is a condominium between BNDES and the commercial banks. They dominate different areas, and have a long tradition of risk and information sharing in large credit loans. BNDES has an important influence in very large investment projects for industry and infrastructure, and in consumer credit for capital goods with high local content. This is due to the long maturity, low cost and large annual of its budget (R\$ 190 billion or US\$ 70 billion). The development bank also plays a very important countercyclical role that helped stabilize the corporate credit market in moments of crisis, as in the 2008-2009 episode.

The commercial banks long term credit for corporations is a byproduct of their normal short term (up to 2 years) lending activities. When the credit lines to large companies are full, due to demand or changes in the regulatory framework, the banks ask their clients to issue debentures because it is a more efficient and less costly way to provide large amounts of credit, on account of tax and regulatory incentives, if the client can access the capital markets, and if the amount of the credit is large (over R\$ 250 million or US\$ 100 million).

This business model does not compete with BNDES loans, which follow a different tax and regulatory framework. As a matter of fact, the two sub-systems are mostly complementary. The commercial banks deal with the "long term working capital" of the companies and they complement BNDES on the funding of the long maturity investment operations of the corporations. Sometimes, there are frictions between them when a large client is involved. For example, when BNDES extended a large loan to Petrobras during the 2008-2009 crisis, the commercial banks complained that they were not allowed to take part in this credit operation, because they wanted to increase their exposure to the well rated state oil company.

Despite this division of labor, the two sub-systems compete for the global demand of credit of the corporations. There is a Ricardian price structure in the market. BNDES usually offers the cheapest loans. Therefore, when investment projects are structured, the companies try to maximize the access to BNDES loans and use the commercial bank market as a complement. Therefore, there is some substitution between the two-subsystem, depending mostly on the difference between BNDES rates (TJLP) and the rest of the markets' (Selic).

kind of competition started recently between the A second commercial banks and some of their largest clients. Those companies have long experience of issuing overseas, and want to be more independent from the banks and access directly the non-bank investors. They want to build an interest rate term structure of their own and a secondary market. The most important barrier they face at this stage is regulatory. There are two ways to make a public offer in Brazil. The usual one called "restricted" [60] because the bond can only be sold up to 50 investors. There is no need to be pre-approved by the regulatory body (Comissão de Valores Imobiliários - CVM) and, therefore, transaction costs are very low. The second way is by means of a "registered" offer[61]. There is no limitation of the number of buyers, but it has to be pre-approved by CVM. This can take a long and unpredictable time and is very costly. The growing preference for "restricted" offers is illustrated on Figure 11. It shows that after the possibility of Restricted Offers was enacted in 2009, the volume of "registered" offers diminished severely.



Figure 11: Public Offers of Debentures by Distribution

Finally, the households and institutional investors are newcomers to this market. They prefer to operate through investment funds managed by banks, and concentrate their direct operations on public bonds. However, whenever the Central Bank brings the nominal Selic rate under 10% a year, they are encouraged to carry on more private risk buying debentures directly on public offers. This was a clear phenomenon in 2012 when the Selic rate fell to its lower ever level, 7,5% a year. There was a run for yield both, from the closed pension funds and the rich families. At the same time, some well rated companies started issuing in the domestic market and tried to access those non-bank investors.

A more "normal" market started to develop, but its pace will always be tied, on one side, to the difference between the Selic rate and the expectation of inflation and, on the other side, to the difference between the TJLP and the Selic rate. The higher the real rate paid by the public bonds, the less the rich families and pension funds will be willing to diversify their portfolio towards private bonds. At the same time, the higher the Selic rate is, the less stimulated the corporations will be to issue in the domestic market. Also, if TJLP is much lower than the Selic rate and BNDES has a lot of funds, the corporations will try to maximize the borrowing with the development bank, and there will be less demand for the rest of the market.

5. Policy Recommendations

Brazil has a small corporate long-term bond market. The relative size and depth of the Brazilian market is still behind those of developed countries, but also of developing nations from Asia and even from Latin America. The main reason for this "relative backwardness" is that interest rates have been kept high for a very long period. This, on one hand, inhibited the corporations to issue bonds and, on the other hand, concentrated the demand for long term assets of investors on the public debt, which also guarantees very low risk and high liquidity. In addition, the regulatory bylaws still discourage the issuance of corporate bonds for non-financial investors.

Given this situation, we suggest that the government changes the emphasis of their work. So far, their efforts have focused in creating a fiscal and regulatory framework that encourages the release of private securities long-term oriented for fixed investments. In the next future, despite the perspective that the Central Bank will maintain the base rate at levels over two digits, the government should initiate a program to foster the issuance of "infrastructure bonds". This program should have the goal of R\$ 50 billion of these debentures until the end of 2018, the last year of the administration of President Dilma Rousseff.

In order to encourage the market, the state-owned banks - BNDES, Banco do Brasil and Caixa Econômica - would offer a firm commitment to a substantial portion of the offers of "infrastructure bonds", which would only be exercised if emissions were not fully distributed to investors. Besides that, all financial institutions would have a tax benefit of 10 percentage points, if they have to hold them in their portfolio up to two years.

The infrastructure debentures purchased by the public financial institutions should be financed by borrowing from the market, through the instruments already available, such as Financial Bills ("Letras

Financeiras"). There would be no need for additional supply of scarce fiscal and quasi-fiscal funds for meeting this goal.

At the same time, these portfolios of the public banks would be subject to periodic auctions, through electronic platforms. This mechanism would allow portfolio managers, other than the banks, to buy such securities at any time and, therefore, to establish sales strategies to their clients, particularly abroad, without being dependent on the primary market.

Regarding the liquidity of the bonds with income tax benefit, the most important measure would be to extend the exemption from income tax to foreign investors' portfolios, which hold assets that have the same incentive in any proportion. Currently, there is a legal requirement that such funds, to be tax free, have a very high percentage of government bonds or, alternatively, private papers.

The "infrastructure bonds" faces competition from other securities backed in real estate and agricultural receivables that offer the same benefit to investors and are not subject to the same restrictions as the "12431 debentures". They can offer shorter maturities, indexation to the Selic rate and be issued by the banks. We suggest that the regulatory framework of the tax benefits for long term securities should be consolidated in one only level playing field, for any issuer of any sector. This new regulation should be based on the rules for "infrastructure debentures". At the same time, the banks would not be allowed to issue bonds with tax benefits.

The approval process for registered bonds under CVM Resolution 400 should be liberalized, and this kind of offer should be stimulated. The program of the companies should be pre-approved by CVM., so

that when a market window opens, the company only supplements the information with the final financial conditions, without having to undergo the approval process again. Also, the advertising material would not have to be approved in advance by CVM anymore. This Authority, instead, would set strict penalties for issuers who failed to meet a number of obligations previously determined. Among them, the responsibility to disclose to investors if any relevant information is changed during the registration and distribution process.

6. Final Remarks

Over the last decade, the long-term credit market in Brazil has undergone a major transformation in terms of scale and structure. Long term credit supply for non-financial corporations remains segmented and dominated by BNDES, with the support of special public funds and loans from the National Treasury. However, the funds intermediated by the private sector, virtually nonexistent before, have had a more important role.

The commercial banks have been the leading actors of this structural change. They have been extending large amounts of long term credit to non-financial corporations through the acquisition of debentures, instead of using its own balance sheet. Financial institutions linked to the distribution processes acquired most of the public offers. This strategy is completely in line with the legal apparatus. Buying debentures instead of offering traditional credit operations is cost efficient for their clients, and gives the banks more flexibility to deal with credit limits, and to diversify risks. However, these transactions cannot be considered as typical capital market operations, as the underwriters, in most cases, did not make any sales effort. It is, in

fact, a traditional bank loan transaction extended by means of a debenture.

Thus, to understand the actual role of banks in the long term of credit market is not enough to analyze their balance sheets where traditional credit operations are booked. One must also follow their role as capital market investors and managers of investment funds for institutional investors and families.

Alongside the banks, the relevance of these other local investors has grown in the last few years. They were attracted by the higher yield offered by corporate bonds, a phenomenon that intensified during the period in which nominal interest rates fell below two digits. Private bankers, family offices, wealth management firms are becoming important players in the debentures market.

However, it's important to note that the development of this market will essentially depend on the evolution of interest rates. There is no doubt that high interest rates retract away investors who prefer to buy and hold public bonds that, under these circumstances, offer a better risk-return benefit. Similarly, when BNDES rates are kept well below to those applied in the private market, there is a natural tendency of the companies not to consider other sources of funding, and try to finance most part of their projects with funds from the development bank.

In this context, the adequacy of investment financing mechanisms in Brazil remains on the top of the agenda of Brazilian policy makers, to sustain a reasonable growth path without depending too much on BNDES funds. In this scenario, is the capital market prepared to supply, even partially, these funds for fixed investment? From the point of view of regulatory, tax apparatus and market infrastructure, the answer to this question is positive, although there is a regulatory framework that can be improved.

Therefore, it seems that the financing structure for investment in medium-term horizon, two important changes. Brazil will face. in a First, it is expected that the public banks loans portfolios will not continue to grow at the path observed in the recent years. Rather than that, it is likely to suffer some contraction relatively to the private sources of financing. Second, another phenomenon to be confirmed is that private agents will be able to compensate that structuring, distributing and even investing in corporate debt securities, with characteristics that are favorable to companies in terms of maturities and indexation. However, it seems that these two phenomena will not occur at the same speed and intensity, what could hurt the level of fixed investments. The government has to act quickly to foster the development of the long-term market to accommodate the lack of BNDES funds. The response of the corporate bond market, however, will depend mainly on the levels of interest rates and on the expectations of economic agents around the trajectory of the Brazilian economy in the coming years.

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Chapter 3 Notes

[50] Financial Corporations issue Financial Bills ("Letras Financeiras") as only non financial corporations are allowed to issue debentures in Brazil.

[51] BNDES may also buy debentures of non financial corporations on public placements, but the scale of these operations is small compared to loans.

[52] Commercial banks also play an important role in the BNDES direct loans as guarantors.

[53] Another possible way to finance BNDES needs in 2008 was to increase taxation or compulsory funding, but those measures would have had a negative impact on the economy

[54] Other sources of funds for BNDES have always accounted for a relatively small part of its budget. External funds have supplied less than 10% of the total funding. Most of these loans are very stable and are lent by multilateral agencies or export credit agencies. In 2012, foreign loans had dropped to 3% of the total liabilities. The same applies to bonds (corporate bonds) in the local market. In this case, participation is even lower.

[55] In addition, there was also the facilities offered by the American bankruptcy law

[56] The major exception to this picture was Chile.

[57] This is the number of the law that created the tax incentive for these debentures

[58] All debentures of leasing companies were purged from this sample.

[59] Mostly pension funds

[60] It is based in CVM Resolution 476

[61] It is based in CVM Resolution 400

4. Foreign Exchange Derivatives, Banking Competition and Financial Fragility in Brazil

Daniela Magalhães Prates and Maryse Farhi

Introduction

Financial innovations have spread across Latin American and Asian economies since the 1990s, when these formely called developing countries joined the process of financial globalization, becoming emerging economies. Yet, due to domestic macroeconomic and institutional factors, this movement has been uneven, and came out with different results.

While in Asia securitization has risen at a rapid pace[62], it has been quite the opposite in Latin America[63] which still trails on, unable to develop a liquid secondary market. In most emerging countries, financial derivatives are mostly traded in over the counter markets (OTC), while in Brazil a significant share is traded at the organized exchange, Bolsa de Mercadorias e Futuros (BM&FBovespa).

Despite their differences, these markets have an important common aspect : the importance of foreign exchange rate (FX) derivatives. This does not necessarily mean that these derivatives are traded in higher volume than the ones linked to interest rates or stock indexes. This peculiarity of emerging economies stems from the position of their national currencies at the lower end of the international hierarchy of currencies.[64] Foreign exchange rates have always been at the core of all emerging countries' crisis. Thus, FX derivatives have the potential to allow hedging risks, mitigating the crisis, or to exacerbate its depth due to leveraged bets that turn sour.

Furthermore, its paramount importance assert itself not only in times of crisis, but all along the cross-border finance cycles[65]. For instance, in the 2000s, the so-called derivatives carry trade has had a key role in the behavior of some EMEs' currencies, among which the Brazilian real (BRL). In FX derivatives markets, the carry trade expresses itself as a bet which results in a short position in the funding currency and a long position in the target currency (Gagnon and Chaboud 2007). Therefore, it is a different kind of currency speculation strategy from the canonical carry trade through spot market operations – that is, borrowing low-interest-rate currencies and lending high-interest-rate currencies (Burnside et al. 2006; Gagnon and Chaboud 2007; Kaltenbrunner 2010).

Brazil stands out among the emerging countries' FX derivatives market because of the greater liquidity and depth (i.e, higher number of trades and turnover) of its organized segment (i.e, the foreign exchange futures market, called BM&FBovespa[66]), in comparison with both, the foreign exchange spot market and the FX Over-the-counter market (OTC)[67]. This specific feature of the Brazilian FX derivatives market is linked to a set of regulatory, institutional and macroeconomic factors, which have reinforced each other since the mid of the 1990s[68].

Concerning these previously mentioned factors, three attract special attention. Firstly, the institutional framework of the Brazilian currency market, wherein foreign currency accounts (bank deposits) are prohibited, with only a few exceptions[69]. Consequently, non-banks residents and nonresidents can't hold foreign exchange spot positions (positions in USD). Only banks authorized by the BCB to have foreign exchange portfolios can hold these positions. This same institutional feature underlies the non-deliverable character of the foreign exchange derivatives markets, namely, gains or losses in this market are settled in domestic (BRL). Precisely because these operations are settled in BRL, any agent can hold positions in the foreign exchange futures market, as long as they fulfill the minimum standards required by the Brazilian exchange. Secondly, institutional traits of the Brazilian financial system have also contributed to the growth of the FX derivatives market, among which, the increase in banking internationalization in Brazil since the mid-1990s. After the banking crisis in 1995, the government fostered the entry of new foreign banks, which had expertise in derivatives trading. These banks contributed with the growth of the secondary government bond markets, shares (stock exchanges), and especially derivatives, acting as brokers (on behalf of clients) and on their own account. They also became the leader underwriters or intermediaries of offshore bond issuance by local banks and companies. Yet, their entry has not been accompanied by a deepening of the domestic capital market, either securities or equities, as a source of business financing, unlike the trend observed in several emerging countries according to BIS (2003a and b). Thirdly, the unrestricted access of foreign investors to the foreign exchange futures market since January 2000.

With regards to macroeconomic factors, the adoption of a floating exchange rate regime in 1999 has increased the demand for foreign exchange hedge and the opportunities to earn arbitrage and speculative gains through foreign exchange derivatives. And, even after the price stabilization and the change in the exchange rate regime, the interest rate differential has remained high.

This specific feature of the FX derivatives in Brazil has reinforced their dual role (hedge and speculation) in distinct occasions, be it to smoothen the impact of a crisis as relevant agents had hedged their FX risks (as in 1999) or to enhance the impact of a crisis as a high number of agents hold a leveraged position that resulted in heavy losses (as in 2008). Yet, another specificity of the Brazilian derivatives market has contributed to the policy response, aiming at mitigating this impact, namely the obligation to register all derivatives operations carried out in the onshore market. More specifically, those conducted both in the organized (the BM&FBovespa) and the over-the-counter (OTC) markets (which are registered in Cetip, a publicly held company that offers services related to registration, depository, trading and settlement of assets and securities).

Many studies have already shown that due to its higher liquidity, the first dollar future contract (30 days between each settlement date) has become the locus of formation of the BRL/USD exchange rate. (Kaltenbrunner, 2010; Ventura and Garcia, 2012; Chamon and Garcia, 2013; Fritz and Prates, 2014; Prates, 2015; Rossi, 2012). Yet, unlike these authors, the focus of this background paper is not the central role of the FX derivatives market in the Brazilian exchange rate dynamic, but the relationship between this market, banking competition and financial fragility in Brazil from 1995 to 2014. The aim herein is to analyze how banking competition has intertwined with the aforementioned factors underlying the specificity of the country FX derivatives market since the mid-1990s.

Besides this introduction and the final remarks, the arguments are organized chronologically in three sections, as follows: (i) 1995-1999:

banking competition and currency crisis; (ii) 1999 to mid-2008: new macroeconomic regime, further financial openness and the first cross-border finance cycle; (iii) Mid 2008 on: The contagion effect of the global financial crisis, the new cross-border finance cycle and the regulatory response.

I. Financial openness, banking competition and foreign exchange crisis

At the time of the adoption of the Real Plan, in July 1994, Brazil received high inflows of foreign capital, attracted by expectations of monetary stabilization and higher assets prices. In the following first months, the Brazilian Central Bank (BCB) fixed only the ceiling of the nominal exchange rate at BRL/USD 1,00, neglecting to set a floor. This "asymmetric free floating" alongside the surge in foreign capital resulted in the appreciation of the Brazilian currency in nominal and real terms.

In response to the contagion effect of the Mexican crisis, a managed foreign exchange policy was instituted in March 1995. The monetary authority determined a narrow band with a floor and a ceiling, in which the exchange rate was allowed to float. Implicit in this policy was the engagement of the BCB to buy any amount offered at the floor price and sell any amount bided at the ceiling price.

Hence, from March 1995 to January 1999, the Brazilian version of the exchange rate anchor was not a radical fixing of the exchange rate (as the case of neighboring Argentina), but rather a fixing of the nominal exchange rate within a crawling band. Ex post, devaluations
of the crawling band appeared to be rather constant (0.7% p.m.), but were handled discretionarily.

Yet, this policy did not prevent further currency appreciation in real terms due to inflation rate differentials that constantly outstripped nominal devaluation. Together with trade liberalization, this real appreciation turned around trade flows. After having shown a slight surplus for some years, the current account experienced sharply increased deficits between 1995 and 1999. Indeed, the mix of currency appreciation, restrictive monetary policy, financial openness and trade liberalization was at the heart of the Real Plan success in promoting the fall of inflation and maintaining it at low levels[70].

The introduction of the real fostered the financial volume of derivatives traded at the BM & F. Futures contracts rose from a notional amount of USD 532 billion in 1993 to USD 1,576 billion in 1994, despite the adoption, in December 1993, of measures aiming at limiting foreign investors' access to the domestic derivative markets. Resolution n. 2634 of the National Monetary Council (CMN), dated 12/17/1993 approved the creation of Fixed Income Funds to Foreign Capital (FRFCE). In the context which the government sought to discourage the short-term inflows, the FRFCES were prohibited to invest in mutual funds and private bonds, as well as in operations with options. Their operations in the futures market became restricted to hedging purpose (Prates, 2015).

In that same period, the first supervisory measures and regulations specific to OTC derivatives markets were taken. Hitherto, supervisory tasks were simpler, as long as derivative operations were concentrated in organized markets. The growth of OTC markets was triggered by monetary stabilization and banks taking a bolder approach of these operations seen as a new source of revenue.

Prudential measures were taken in early 1994 (CMN Resolution n. 2042) to enforce the register of swaps operations either at BM&F or at the Central Clearing and Depository of Private Securities (CETIP). These measures lead to the creation of a relatively organized OTC market, unusual in other financial centers (including those from advantages of registering countries). The developed OTC transactions are: a) from the participants' view point, it reduces the legal risk of the contract between counterparts; b) from the supervision's point of view, it is useful to follow the intricate web of relationships and commitments made between financial institutions to make it more transparent and increase the security of the whole system. Since then, at least with respect to the transparency of OTC markets, it can be said that the supervision and regulation of derivatives in Brazil have been more advanced than elsewhere.

The price stabilization had negative impacts on parts of the financial system. In 1995, a banking crisis unfolded, as some public and private banks were unable to balance their books in face of the end of inflationary revenues and of the sharp decrease of nominal interest rates (still high in real terms). This crisis was perceived as a threat to monetary stabilization and promptly led to government measures. In November 1995, the Program of Incentives to the Restructuring and Strengthening of the National Financial System (Proer) was launched. Through Proer, the Central Bank funded the acquisition of insolvent institutions, absorbing their non-performing loans while transferring liabilities and performing assets to the acquiring institutions. At the same time, with the aim of easing up the restructuring of the domestic banking system, the norms relating to the entry of foreign banks was loosened. In 1997, the Incentive Program for Reduction of the State Public Sector in Banking Activity (Proes) was established to promote privatization, extinction and/or restructuring of State and local public banks. Federal banks were kept out of this program.

The banking crisis and the measures adopted opened the way to a much higher internationalization of the Brazilian banking system, as foreign banks entered the country through acquisitions within Proer and Proes or mergers with national banks. At the same time, despite their high cost (estimated at 9.7% of GDP), public and private banks programs reduced financial fragility and potential systemic risks. Their benefits were brought to light in 1999, when a foreign exchange crisis was not accompanied by a banking crisis, thus reducing its macroeconomic effects. Indeed, among the emerging countries that faced financial crisis in the 1990s, only Brazil did not have a "twin crisis" (foreign exchange and banking crisis). The design of these programs showed that the government intended to reduce the extremely elevated lending rates by introducing more competition in the banking system. Yet, it was only partially fulfilled. Competition was fierce on proprietary trading, but not on extending credit. Thus, lending rates remained almost unchanged.

Foreign banks introduced innovations in big banks' portfolio management and proprietary trading, in particular the use of derivatives, either for hedge or speculation purposes. Having acquired Brazilian banking institutions, they were legally considered "local banks" not subject to the restrictions imposed on foreign capital in the derivative markets.

Until then, the major national banks had been very shy in the use of these instruments. Their mimetic reaction was extremely quick. The average daily volume of futures contracts trading on the BM&F rose from a notional amount of USD 23,658 billion to 75,163 billion, from January-August 1996 to January-August 1997. Many smaller banks and financial institutions also adopted the recently introduced kind of money management, and leveraged their portfolios. With open interest equivalent to several times their equity, their risks were also multiplied and their losses could turn out to be higher than the equity.

In November 1996, the Brazil's Central Bank (BCB) started to shorten the dollar/real future contracts – in other words, the BCB was selling dollars against real - in order to defend the managed foreign exchange policy adopted soon after the Real Plan. These contracts are "non-deliverable" due to the particularities of the Brazilian legislation (see Introduction). Hence, BCB is allowed to provide the equivalent of foreign currencies without having to make use of international reserves to settle its operations. However, their financial results are reflected in government accounts, either as revenue when the Central Bank obtains profits in its operations, or as an expense, when the result of BCB's operations in the futures markets is negative. The same legislation applies to the government bonds indexed to the foreign exchange rate. Those bonds were already issued and negotiated in large volumes before the monetary authority operations in the derivatives market.

During the 1997 Asian crisis, Ibovespa stock index plunged, public bonds fell and capital flight built pressure on the exchange rate. BCB short position in forex future contracts swelled. The situation in FX derivatives markets signaled the occurrence of a speculative attack against the real. The daily average of forex futures contracts traded on the BM&F fell from 227,495 in September 1997, before the speculative attack on the stock exchange of Hong Kong and Korea crisis, to 172,955 in October, 123,691 in November and 67,489 in December. The reduction in volume revealed the vanishing of expectations' divergence required for the liquidity of these markets. It showed that most participants had no confidence in the possibility of exchange rate stability, and therefore sought a long position and/or liquidate short positions in BRL. The exception was the BCB, who continued to sell large volumes of futures contracts. The differential between the spot exchange rate and the future (basis) increased suddenly and sharply, indicating expectations of exchange rate change in the future. In other words, the increase in the basis reveals that agents are embedding high expectations in future prices, greater than those indicated by the current interest rate on the money market for the period. The rise in interest rates during this speculative attack contributed to further boost the differential between the spot and future exchange rates. These high interest rates led to higher future values of all financial derivatives, including the exchange rate, causing losses to those with short position, among which the BCB, and increasing the buying pressure from those who wanted to cover their short positions.

In all periods of unusually high volatility, participants in derivatives markets know that while some won large sums, others lost the same consolidated amount. To the extent that the derivatives positions are not transparent to all the participants, rumors of financial stress came up from the derivatives transactions previously made by those participants, on the assumption that they were not covered by the opposite position in the spot market. In 1997, heavy losses of mutual funds managed by various banks were disclosed, with a leverage equal to up to twenty times their equity, heightening the turmoil. Assets prices fell more than 30%, in response to the Asian crisis, which means that it was sufficient to be leveraged in three times to lose all the equity. Insolvency fears of financial institutions rose further with a doubling of interest rates. The open positions in derivatives markets were very large, and the margin calls to be paid after such abrupt change in monetary policy exceeded the value of the pledged collateral.

Rising interest rates and the adoption of a fiscal austerity program, in November 2007, allowed the authorities to tackle the first serious speculative attack against the real. As the impact of the Asian crisis started to wear off, the Central Bank made a profit on short positions in futures contracts on the BM&F. This was the first episode in which derivatives played an important part in the heightening of financial instability.

On the other hand, it is important to point that it also constituted a learning process (at least, for a while, as market participants' memory tend to be short lived). The leverage levels decreased and a Chinese wall, separating clearly the management of cash resources of financial institutions from the management of third party resources, was adopted. That Chinese wall was first introduced by foreign capital banks' and copied by the national ones. At the same time, discussions started about a more accurate and comprehensive regulation of the various types of mutual funds, that would bear fruits a few years later.

A short period of relative calm following the Asian crisis ensued. The privatization of the telephone system and the return of foreign capital flows contributed with the strengthening of foreign reserves. Then, in mid-2008, the Russian crisis came up, which led to a more lasting negative perception of international investors towards emerging economies, causing more severe impacts than those recorded in the Mexican and Asian crises. International capital flows decreased significantly and capital flight, speculative attacks on currencies and bonds and stock prices decreases were more pronounced.

In face of the announcement of the Russian moratorium in August 1998, international investors panicked and carried out massive selloff of emerging countries assets. Many of them had substantial losses, including German and American banks. In Brazil, markets tumbled once again. Pressures on foreign reserves by capital flight started to mount. The proximity of presidential elections and the perceived weakness of the exchange rate policy contributed with the deterioration of expectations. Risk aversion and the lessons from the previous crisis reduced leverage levels. Less and less agents kept betting in the maintenance of the exchange rate regime, with the notable exception of the BCB. Information provided by the operators of these markets indicates that the Central Bank intervened towards the end of the session, to influence the settlement prices[71]. The number of contracts sold was determined by the amount needed for those prices to be within the parameters considered appropriate by the monetary authority.

The short positions in FX future contracts got more and more concentrated in the hands of the BCB, as it took a more aggressive stand to try to ensure the survival of the exchange rate policy. It is worth it remembering that the non-deliverable status of Brazilian derivatives on foreign exchange provided an extremely flexible instrument to the BCB, which allowed it to sell, regardless of the country's foreign reserves.

An important vector of contagion was the exposure of major international banks to the economies in crisis. The Bank for International Settlements (BIS, 1999, pg 9) points out that "Available data provides evidence of an international credit squeeze for most emerging market borrowers in the third quarter of 1998. Reporting banks' claims on Asian countries declined for the fifth consecutive quarter (by \$23 billion), bringing the outstanding exposure to the region at end-September back to its end-1995 level. At the same time, banks began to retreat from Eastern Europe and Latin America, with credit flows to Russia and Brazil being particularly affected".

International market participants sought to designate the next country or region to fell in crisis. The choice was easy. The same BIS report (1999, pg 10) highlights that "The repercussions of the developments in Russia, on international banking flows to other emerging market economies were particularly severe for Brazil, which accounted for virtually all of the \$8 billion reduction in outstanding claims on Latin America. Brazil's vulnerability to a new round of risk reassessment in the international market had been exacerbated by its rapid accumulation of short-term debt and, in the period under review, by the uncertainty surrounding the policy stance before the October elections and discussions concerning the IMF-led support package. The series of measures adopted by the authorities in August, to protect the country's foreign exchange reserves did not prevent international banks from scaling back their credit lines. This, together with some evidence of capital flight, resulted in significant drops in the country's official reserves."

Upcoming presidential elections, and the sudden stop of capital inflows made imperative an agreement with the IMF which provided resources for the continuity of the pegged foreign exchange rate. In late September 2008, international reserves had lost \$ 24.4 billion and financial flows remained negative. The agreement with the IMF took place in November. It included an adjustment program in exchange with an international aid of USD 41,5 billion from the IMF, IBRD, the BID and a set of industrialized nations articulated by the BIS.

The crisis, which began with the Russian default, had profound effect on the Brazilian economy. Even when the international scenario brightened, especially with the cuts in US interest rates on November 17, 1998, Brazil remained immersed in a situation of severe financial instability, with agents demanding securities indexed to the exchange rate and seeking to transform their holdings in BRL to USD. As soon as the perception that the crisis had acquired national features, instead of reflecting other emerging countries problems became dominant, the daily average of contracts traded on the BM&F waned. This decrease revealed both, the risk aversion of agents and a convergence of expectations incompatible with a high liquidity in the derivatives markets. Sharp falls in open interest indicated that the agents were not rolling their positions, as their contracts reached settlement day. For the whole year of 1998, the daily average of contracts traded on the BM&F fell 26.6% in 1998, and trading volume declined by 12.3%. The most significant fall was recorded by exchange rate derivatives contracts: -51.5%, while the interest rate derivatives saw a much lower reduction: -2.7%.

On the other hand, futures contracts traded on the International Monetary Market (IMM) of the Chicago Mercantile Exchange (CME) had a sharp and sudden increase in volume, as of August 1998. Not getting massive sale orders from Brazil's Central Bank, the quotes of the BRL exchange rate contract in Chicago were higher than those on the BMF. By acquiring liquidity and signaling higher devaluation than in the Brazilian market, operations in Chicago aroused interest of those who wanted to bet in a FX regime change who, without the BCB interventions, could more easily take positions, those who believed that the exchange rate policy would be maintained, that it could have potential higher profits due to higher prices than in the BM&F, and of those who performed arbitrage operations between the two markets by buying contracts on the BM&F and selling them on the CME. Foreign capital Brazilian banks' had the upper hand in those arbitrage operations, as their international network is much more extended than the national capital banks.

Transactions amounted also in international markets of OTC derivatives through the non-deliverable forwards market (NDF). This market is not transparent and it is impossible to obtain accurate information about it. Business journals reported that at the beginning

of September 1998, the premium paid to those who accepted the risk of a devaluation of the BRL reached 20%, after trading at 2% before the Russian crisis[72].

In all of those markets, the most outstanding participants were financial institutions with a very specific profile - large international banks with major operations in Brazil and in New York. Moreover, most non-financial companies sought protection from currency devaluation, through operations on the derivatives market. They can be distinguished in two categories: those who had liabilities in foreign currencies and were actually hedging their exposure, and those without liabilities in foreign currency that were objectively taking a speculative position to profit from a currency's regime change.

At the time of the Russian crisis, the general atmosphere of tension was given by international events, but contrary to previous crisis, the Brazilian financial markets were mostly driven by internal uncertainties. In other words, the financial instability following the Russian default quickly acquired its own dynamics, dictated by internal factors. This dynamic included a higher deleveraging of financial institutions, and a much higher percentage of agents that sought hedge of their foreign exposure or "the maintenance of their international buying power".

If at the microeconomic level, these movements were logical and rational, its macroeconomic impact was a huge increase in the demand for foreign currencies or assets, linked to the exchange rate that culminated in the currency crisis. In the managed exchange rate regime in force, all the spot market demand had to be met by the foreign currencies reserves that were depleted in few months after the Russian crisis. The level of the adjusted net foreign reserves (i.e, non-borrowed reserves) was \$34.497 billion on 31 December 1998. More than USD 5 billion left the country in the first two weeks of January 1999. The reserves level was well below the floor of USD\$ 33.2 billion, established in the agreement with the IMF. By the agreed mechanism, it should trigger a compensatory monetary tightening.

As the macroeconomic situation continued to deteriorate, the government's room for maneuver became extremely narrow. To apply the terms of the agreement with the IMF and raise interest rates in a context already frankly recessive, could be politically disastrous, and possibly contribute with the formation of even more negative expectations, as it would show that monetary policy had lost efficiency against speculative attacks. Not applying the terms of the agreement with the IMF would, at best, cause another massive outflow of dollars and, in the worst case, the need to renegotiate the agreement.

In middle January 1999, soon after the inauguration of the recently reelected government, a new foreign exchange policy was adopted. The process was tumultuous, characterized by great nervousness, intense fluctuations in the exchange rate, pricing difficulties for government bonds and pressures on interest rates. The devaluation of 62% in two weeks was a typical case of overshooting in a speculative attack, in which speculators accentuate their pressure, taking advantage of the reluctance of other financial agents to sell the hard currency or anticipate their purchases for fear of additional pressure on the rate.

These factors were not the only ones responsible for the magnitude of the devaluation of the real during the January. On one hand, the BCB 's actions were perceived as shy and insecure by the financial markets. The BCB avoided, in its meeting of January 18, to raise the interest rate aggressively, as expected by the market and recommended by the IMF, as this measure was supposed to stimulate the repatriation of foreign exchange and reduce inflationary pressures arising from the devaluation. But, most of all, its operations in the foreign currencies market (either spot or derivative markets) stalled.

On the other hand, news and rumors about losses incurred by financial institutions, investment funds and companies with debt in foreign currency played a role in the overshooting. For fear of systemic risk, the BCB rescued some of these financial institutions. They were small, but maintained highly leveraged short positions in FX futures contracts. The lack of liquidity in the derivatives market, locked at the allowed upper limit of prices fluctuation, made their situation desperate. With no liquidity at all, it was impossible for them to cover their position and to measure their losses. The BCB provided that much needed liquidity in derivatives to avoid having those institutions demanding spot dollars. This decision eventually led to the resignation of the new BCB's president, and the installation of a Congress inquiry.

From the Russian crisis to the adoption of the floating rate policy, the BCB's short position grew rapidly. On the eve of the change in foreign exchange rate policy, it's position was around 59% of total open interest of the foreign currencies contract at the BM&F. After rescuing the above-mentioned institutions, that participation rose to around 70% of total open interest.

Those short positions in derivatives resulted in a loss superior to USD 1,30 billion to the BCB. Some pointed out that the BCB was the "loser of last resort" in the foreign exchange derivatives market. Others considered that it "acted as guarantor of private profitability", while others spoke of a gigantic "socialization of losses" (see Brazilian Senate Final Report, 1999), causing a sharp increase in the domestic public debt and its relationship with the Gross Domestic Product (GDP). Their counterpart reaped solid benefits. Numbers provided by the report of the Congress Inquiry of 1999 show that banks had a profit of USD 3.323 billion in the first quarter, three times the USD 1.87 billion achieved in 1998. Of the ten banks that profited more in the quarter, the four largest Brazilian banks registered losses in the dollar's value of their assets. Even though they had hedged their FX risks, their profits in normal banking operations were more than enough to register a consolidated profit in that period. The six others most profitable in the quarter were all foreign capital banks'. Their equity gains ranged from the extraordinary 231.52% of JP Morgan, 99.74% of Chase Manhattan and 41.03% of the Morgan Guaranty Trust to modest 8.33% of Citibank NA and 1.95% of BBA Creditanstalt.

But the currency crisis of January 1999 did not cause a financial crisis or an economic recession of major proportions, unlikely other countries which went through similar crisis. In the first year after the adoption of floating exchange rate policy, South Korea, Thailand and Mexico respectively suffered a contraction of their GDP of 5,8%, 8% and 6,2; while Brazilian GDP grew by 0,7%.

Four main factors can be pointed to explain this phenomenon, which contradicted the expectations of many economists. The first lies in the financial system reorganization, which started in 1995, thus avoiding a concomitant banking crisis (the so-called twin crisis). The second stems from the anticipation of a change in the exchange rate policy by the most relevant private agents, who had taken preventive measures. The third is a certain persistence of liquidity in the FX derivatives market, due to the BCB continued willingness of selling dollars, unlike most other agents. The fourth is linked to the non-deliverable status of these contracts, which allowed the BCB to settle its losses in the Brazilian currency that it can issue.

Assets indexed to foreign exchange and FX derivatives provided hedging and speculative instruments, which significantly contributed to form a barrier that strongly attenuated the transmission of financial instability to the economy. The Brazilian currency crisis of January 1999 made the importance of agents' hedging operations very clear. When the crisis breaks out suddenly and unexpectedly, few risks would be covered, and agents bear the cost of their improvidence or speculative spirit. Under those conditions, a crisis started by the financial instability could spread quickly to the financial and productive sectors. In contrast, when the process leading to the crisis is slow, the higher the share of agents anticipating its outbreak, the greater the demand for hedging, and the lower the danger of financial instability spreading to other sectors of the economy would be.

II. 1999 to mid- 2008: new macroeconomic regime, further financial openness and the first optimistic wave

In line with the dominant trend among leading emerging economies, the Brazilian government responded to its 1999 currency crisis through the adoption of a new set of economic policies, based on an inflation targeting policy, a (dirty) floating exchange rate regime and a target for primary budget surplus.[73] This set of policies, implemented under Fernando Henrique Cardoso's (FHC) second term, has come to be known as the New Macroeconomics Consensus (Cunha, Prates and Ferrari, 2012).

That change in the macroeconomic regime was accompanied by a deepening of the process of financial openness in January 2000. All the former regulations were removed, and a new resolution (Resolution CMN n. 2689) allowed the unrestricted access of nonresident (i.e., foreign) investors to all segments of the domestic financial market, including the derivatives market (where since 1995 had been limited to hedging their positions in spot markets as pointed out in the previous section). All kinds of entrance taxes, minimum stay periods, etc. were withdrawn, as domestic and international investors were guaranteed equal treatment.

Therefore, two determinant factors of the liquidity and depth of the FX futures market – the dirty floating regime and the unrestricted access of nonresident investors to the domestic derivatives market – took place in FHC's second term. Yet, these factors have interplayed with banking competition fostered by foreign banks 'strategies in the first term of Luis Inácio Lula da Silva (hereafter Lula), who took office in January 2003, and kept the same macroeconomic policy framework.

Contrary to the period of 1999-2002, featured by a shortage of external capital flows and a high-risk aversion of global investors[74], from 2003 to the threshold of the global financial crisis of 2008, the new macroeconomic regime was implemented in an exceptionally favourable international setting, with rising commodity prices and a boom of capital flows to emerging countries (Prates, 2015, Ocampo, 2007)[75]. Moreover, both the process of financial openness, and of FX market liberalization was further deepened. The Brazilian economy became fully open to capital inflows and outflows in 2005, when residents' capital exports were fully liberalized.

Regarding the FX market, three measures stand out. Firstly, the unification of the commercial (livre) and tourism (flutuante) foreign exchange market and the abolition of the Conta de Nao-residentes (non resident accounts, CC5), which removed all limits on the amount of domestic currency, which physical and juridical entities could convert into US Dollars (Resolution n. 3,265). For the first time, domestic entities were permitted to buy unlimited foreign currency directly from banks, which could then be invested abroad. In addition, return on such investments did not have to be repatriated to Brazil, but could be re-invested overseas. Secondly, the removal of the cap on banks 'short FX positions in the spot market in January 2006. Thirdly, the end of the so-called FX coverage on exports in March 2009 (Resolution n. 3,548), allowing exporters to keep 100% of their export receipts overseas (Prates, 2015)[76].

Nevertheless, despite this broad liberalization, one key institutional feature of the Brazilian currency market, pointed out in the Introduction, has remained untouched, namely, the prohibition of foreign currency accounts by residents and nonresidents, with only a few exceptions (see Introduction), established by the International Exchange and Capital Market Regulation (RMCCI)[77]. It is worth it mentioning that this feature stemmed to a great extent, from the process of high inflation with widespread indexation especially in the financial sector over the 1980s and the first half of the 1990s. of Indexation prevented the dollarization domestic financial operations and the banking disintermediation, on the contrary of what happened in Argentina. In this context, the financial sector engaged in sophisticated trading operations. Financial sophistication was further fostered by the competition between domestic and foreign banks. Moreover, the inflationary process in the country also stimulated the development of the derivatives exchange (the organized derivatives market,), where FX futures contracts are traded.

As FX bank deposits are prohibited, only a few banks which have been accorded the "Authorized Dealer" status from the BCB have access to short term external credit lines in the international interbank market, and can hold spot FX positions (in Brazil, positions in USD). [78] From 2003 to mid-2008, the BCB granted this status to a total of 17 banks. Although the list of dealers changed, it had two common features over this period: foreign banks accounted for more or less half of the list; and some Brazilian and foreign banks were always in the list. For example, the two Tables that follow below show the list for December 2003 and July 2008.

Table 1. Dealer's Banks in the FX Market (December 2003)

	Bank	Capital control		
01	BANCO ABN AMRO REAL S.A.	Foreign		
02	BANCO FIBRA S.A.	Brazilian		
03	BANCO ITAUBANK S.A.	Brazilian		
04	BANCO MIZUHO DO BRASIL S.A.	Foreign		
05	BANCO SANTANDER BRASIL S.A. Foreign			
06	BANCO DO BRASIL S.A. Brazilian			
07	BANCO BNP PARIBAS BRASIL S.A. Foreign			
08	BANCO BRADESCO S.A.	Brazilian		
09	BANCO CITIBANK S.A. Foreign			
10	DRESDNER LATEINAMERIKA AKTIENGESELLSCHAFT Foreign			
11	HSBC BANK BRASIL S.A BANCO MULTIPLO	Foreign		
12	ITAÚ UNIBANCO S.A. Brazilian			
13	BANCO J.P. MORGAN S.A. Foreign			
14	BANCO BTG PACTUAL S.A. Brazilian			
15	BANCO SAFRA S.A. Brazilian			
16	UNIBANCO - UNIÃO DE BANCOS BRASILEIROS S.A. Brazilian			
17	BANCO VOTORANTIM S.A. Brazilian			

Source:BCB.Availableat:ttp://www4.bcb.gov.br/pec/dealers/principal.asp

Table 2. Dealer's Banks in the FX Market (July 2008)

	Banks	Capital control		
01	BANCO ABN AMRO REAL S.A.	Foreign		
02	BANCO BBM S/A	Brazilian		
03	BANCO DE TOKYO-MITSUBISHI UFJ BRASIL S.A. Foreign			
04	BANCO DO BRASIL S.A. Brazilian			
05	BANCO BNP PARIBAS BRASIL S.A. Foreign			
06	BANCO BRADESCO S.A. Brazilian			
07	BANCO CITIBANK S.A. Foreign			
08	BANCO DE INVESTIMENTOS CREDIT SUISSE S.A. Foreign			
09	GOLDMAN SACHS DO BRASIL BANCO MULTIPLO Foreign			
10	HSBC BANK BRASIL S.A BANCO MULTIPLO Foreign			
11	ITAÚ S.A.	Brazilian		
12	BANCO J.P. MORGAN S.A.	Foreign		
13	BANK OF AMERICA MERRILL LYNCH BANCO MÚLTIPLO Foreign			
14	BANCO BTG PACTUAL S.A. Brazilian			
15	BANCO SANTANDER (BRASIL) S.A. Foreign			
16	UNIBANCO - UNIÃO DE BANCOS BRASILEIROS S.A. Brazilian			
17	BANCO VOTORANTIM S.A. Brazilian			

Source: BCB. Available at: ttp://www4.bcb.gov.br/pec/dealers/principal.asp

The "other side of the coin" of the ban of FX currency accounts is the obligation to settle all transactions in the domestic currency (the BRL). Consequently, the Brazilian FX derivatives (futures and OTC) market is non-deliverable, i.e, gains or losses in these operations are

liquidated in BRL. Precisely for this reason, they are outside the scope of the FX market regulation (the aforementioned RMCCI), and there are no limits to banks and other agents' positions in the FX derivatives market, as long as they fulfill the minimum standards required by the Brazilian exchange (BM&FBovespa) (Ventura and Garcia 2010; Kaltenbrunner 2010).

In the case of FX futures market, the main agents have been resident banks (whether Brazilian or foreign-owned), resident institutional investors, nonfinancial resident companies and nonresident investors (figure 1). The wide range of participants has ensured both, a greater trade volume and a larger diversity of opinions, which have underlain the liquidity and depth of this market.

Figure 1. Investor's net positions in foreign exchange futures (USD million contracts1)



Source: BMF Bovespa. Author's elaboration Nota: (1) Notional ammount = USD 50,000 Yet, as Kaltenbrunner (2010) and Rossi (2012) pointed out, between 2003 and mid-2008 foreign institutional investors, primarily hedge funds, were the most important investor group in the Brazilian FX futures market, fostering a currency appreciation trend through derivative carry trade. This is a different kind of currency speculation strategy from the canonical carry trade through spot market operations – that is, borrowing low-interest-rate currencies and lending high-interest-rate currencies. In FX derivatives markets, the carry trade expresses itself as a bet, which results in a short position in the funding currency, and a long position in the target currency (Burnside et al. 2006; Gagnon and Chaboud 2007).

Under the very favorable international context, which resulted in the fall of the country-risk, that strategy was stimulated by the Brazilian high policy rate and by the (dirty) floating exchange rate, which has increased not only the demand for hedging currency risk, but also opportunities for speculating through bets on exchange rate changes. Due to the huge differential between the internal and external interest rates, foreign investors made one-way bets on the appreciation of the Brazilian currency through short positions in the FX futures market (selling US dollars and buying BRL – see figure 1), which resulted in downward pressure on the USD price and, thus, upward pressure on the BRL price (Prates, 2015).

The derivatives carry trade turns out to be even more attractive in Brazil due to the non-deliverable feature of the FX derivatives market. Foreign and domestic agents can engage into it without disbursing one single USD. Until October 2010, furthermore, this carry trade strategy could also be performed without the expenditure of one single BRL because investors could meet their margin requirements in BRL via domestic borrowed securities or guarantees from local banks (see section III). Despite the predominance of foreign investors, profit-seeking domestic agents, such as institutional investors and companies, have also engaged into it. Consequently, the macroeconomic setting has reinforced the liquidity and depth of the Brazilian FX futures market (see Table 3). According to Johnson (2007), in the first quarter of 2007, "BM&Fs U.S. Dollar contract led the sector (i.e. the foreign currency sector) for the second year, in a row with a 51.4% increase to 10.97 million contracts. It was followed by CMEs Euro FX contract, which rose 22% to 6.73 million contracts".

Moreover, the outstanding performance of the BRL futures market has contributed to the increased trading of the Brazilian currency on foreign OTC markets through Non-Deliverable Forward (NDF) contracts.[79] This is because the existence of a deep futures market has made it possible for banks which have an account with the local exchange to sell BRL abroad (meeting the demand of international investors who were betting on the BRL appreciation), and simultaneously hedge their BRL exposure in the onshore future market. Although Brazilian banks with foreign branches have also participated in this class of operation, foreign banks have been the most active, standing out as foreign investors' counterparts (Kaltenbrunner 2010). The growth of the NDF market for the Brazilian real in turn has enhanced even more the liquidity and depth of the Brazilian futures market. In this setting, some international investors began to use the BRL futures contracts as a proxy for other emerging currencies' derivatives, which have been highly correlated with the Brazilian real (such as the Turkish lira and the South-African rand), but do not have deep and liquid derivatives markets, which further increased the trading of BRL futures contracts (Prates, 2015).

Table 3. Brazilian FX market

	Daily averages (USD milhões)				Change (%)	
	2001	2004	2007	2010	2007/04	2010/07
Spot ⁽¹⁾	3,461	2,568	4,754	5,508	185.1	115.9
Primary	1,665	1,845	3,390	3,906	183.8	115.2
Interbank	1,796	723	1,364	1,602	188.6	117.5
Derivatives	2,463	2,670	8,844	23,286	331.2	263.3
Local ⁽²⁾	1,916	1,674	3,390	7,313	202.5	215.7
Cross-Border ⁽³⁾	547	996	5,454	15,973	547.6	292.9

Source: BIS. Triennal central bank survey of foreign exchange and derivatives market activity, 2010 e 2013. Disponível em: www.bis.org.

Notes:

(1) The sum of the daily averages overestimates the value traded due to double counting.

(2) Future and OTC contracts.

(3) Non- Deliverable Forwards (NDF).

In the domestic FX market, FX futures and spot markets are linked by arbitrage that is carried out exclusively by banks 'dealers, which are the sole agents who can hold FX spot position. In general, those agents took the opposite position of foreign investors in the FX futures market (long position in USD and short in BRL), buying USD in this market and selling them in the spot market (see figure 2). With this strategy, banks earned arbitrage profits and, at the same time, generated additional pressure on the USD spot price, which meant a drop in the BRL–USD spot exchange rate, and an appreciation of the Brazilian currency.

Hence, although nonresidents investors have had a central role in the deepening of the domestic FX derivatives markets over that period as many authors pointed out (Kaltenbrunner, 2010; Rossi, 2012), this role could only be performed because banks, mainly the foreign ones, took the contrary positions, either in the NDF market or in the FX future market, ensuring the diversity of opinion that underlies the liquidity in financial markets, among which the FX market. Yet, as brought to light by the contagion effect of the global financial crisis (see next section), banks also took the contrary position of non-financial companies both, in the NDF contracts and the domestic OTC market (Cetip), which contributed to boost the liquidity of the future market too.

On the other side, foreign banks participation in the domestic credit market has remained small. Their share in the outstanding credit to the private sector grew from 6.4%, in January 2003, to 8.1% of the total, in mid-2008. In the period after the global financial crisis, analyzed in the following section, that share has stayed on this low level (see figure 2).

Figure 2. FX spot market (USD billion)



Figure 3. Outstanding credit to the private sector according to the capital control (as percentage of the total)



III. The contagion effect of the global financial crisis, the new cross-border finance cycle and the regulatory response

The financial crisis, which started in mid-2007 with soaring insolvencies and the devaluation of real estate and assets related to high-risk (subprime) mortgages in the United States, turned out to be a global financial crisis in the second half of 2008, following the bankruptcy of Lehman Brothers on 15 September 2008). This crisis led to a strong appreciation of the dollar and, simultaneously, a huge depreciation of some emerging economies' currencies, which had appreciated since 2007. Directly hit by a new sudden stop of capital flows, the assets prices and the exchange rates of those economies, mostly commodities exporters, became important targets of the global deleveraging and "flight to quality" (Prates and Cintra, 2010).

In this context, enormous financial losses of important companies of emerging economies with heavy short positions in the foreign exchange derivatives markets came to light. Apparently, in the first semester of 2008 they decided to bet in the continued appreciation of their currencies against the dollar, as the dollar intense depreciation had contributed to the strong increase in commodities international prices. Many of them did so by means of exotic derivatives proposed by international banks. The deepening of the crisis generated a burst in commodity prices and a new trend of dollar appreciation, resulting in huge losses in such derivatives bets (Farhi & Borghi, 2009).

Dodd (2009) estimates that "the direct cost to non-financial firms of these derivatives losses, based on the sum of national estimates, is \$530 billion. Possibly 50,000 firms in at least 12 economies have suffered derivatives losses". Many of those companies were exporters, who suffer more intensely the impact of an appreciation of their national currency. From a microeconomic point of view, it was understandable that those companies searched to hedge against such appreciation[80]. However, the value of their operations, a double-digit multiple of their annual exports, revealed that they had also assumed a speculative posture. In spite of the overlapping of hedge and speculation postures, they could be distinguished as follows: the hedge one stretches up to the estimated value of the company's exports within a given period, and the speculative one would be the difference between the total value of the FX derivatives contract and such exports. Dodd (2009), although emphasizing the use of financial derivatives for hedging purposes, also points out its speculative use by Brazilian and Mexican companies along with others from China, South Korea, India and Hong Kong.

In Brazil, Sadia, Aracruz and Votorantim were the first companies whose losses with FX derivatives were made public. Sadia had a short position of USD 8.4 billion, and recorded in the third quarter of 2008 a loss of USD 370 million[81]. Aracruz, one of the most exposed Brazilian companies to those derivatives, recorded losses of USD 2.13 billion, and the Votorantim Group's of USD 1 billion. In late October 2008, the director of Cetip[82], Jorge Sant'Anna, informed that there were over five hundred companies involved in the FX derivatives. (Chiarini, 2008). According to a survey held by Agência Estado (2008), in the first semester of 2008, 37 of 50 non-financial companies of Ibovespa maintained short positions in FX derivatives.

Furthermore, foreign investment banks rapidly mimicked by private national banks, also began to offer loans tied to FX derivatives, which contributed to keep corporate credit growth between March and August 2008. The launch of this financial innovation was stimulated by the upswing moment of the Brazilian economy (and, therefore, higher demand for working capital), as well as by the rise in the borrowing cost, both in the domestic capital and the international markets due to the subprime crisis deepening (Prates, 2010).

This new kind of corporate credit[83] resulted in a lower lending rate if the BRL/USD exchange rate was lower than that stipulated in the derivatives contract (usually 2 Brazilian reals per dollar). For the banks, these operations provided an insurance against exchange rate depreciation (which historically led to macroeconomic instability, with negative effects on the borrowing cost and the debtors' ability to pay), assessed as increasingly likely, due to the worsening of the international crisis. However, the debtors would have to pay a much higher rate if the market rate was higher. The downward trend of the BRL/USD exchange rate since 2003 led banks and companies to underestimate the risk of those operations. Several other medium size companies - in the industrial, construction and commerce sectors, along with medium size banks - with a primary focus on the domestic market, also engaged into it due to their lower interest rates, although at smaller volumes. As Kregel (2011) points out, the expectation of a sustained appreciation of the Brazilian currency had fostered investments banks to sell Over-the-Counter (OTC) market derivatives to export firms who were interested not only in hedging the estimated exports, but also in obtaining speculative gains to offset the competitiveness loss due to the currency appreciation.

In the case of the larger Brazilian exporting companies, a higher number of the derivative contracts was performed in the offshore OTC market, making it impossible to evaluate their size and extension. The FX derivatives contracts performed in the Brazilian market were mostly OTC operations, registered at Cetip. Data from BM&F shows that the non-financial companies participation in the organized market was quite small in that period. In turn, the Cetip's information (see figure 4) shows USD 94.7 billion in non-deliverable forward contracts between banks and their non-financial counterparts on October 29, 2008. They also underline two periods of remarkable increase of these contracts: the first, in late 2005 and 2006; the second began in late 2007, and increased from August to September 2008.

100 94,7 90 80 70 60 50 40 30 20 10 0 05/30/05 05/31/06 07/31/06 09/30/05 01/31/06 03/31/06 11/30/06 33/30/05 11/30/05 39/30/06 01/31/07 03/31/07 05/31/07 07/31/07 70/02/60 01/31/08 33/31/08 05/31/08 11/30/08 01/31/09 3/31/09 5/31/09 11/30/07 07/31/08 30/30/08 7/31/09 Source: CETIP, Author' s elaboration

Figure 4. Operations with FX derivatives in the domestic OTC market (USD billion)

Prior to the worsening of the crisis, the selling pressure of dollars by Brazilian non-financial companies in the OTC derivatives markets was conveyed through arbitrage to the spot exchange rate, causing further currency appreciation. At its height, the public disclosure of their losses had a dramatic effect. The size of the shock was directly linked to the unawareness of companies' exposure to short derivative bets in dollars. Since these are "out of balance sheet" operations, they are rather opaque. Even in the cases of publicly traded companies, whose quarterly results are published, the control and the normative structure required to disclose the results of such operations did not exist for non-financial companies. Lessa (2008) points out the urgent need to reform their regulation and supervision, "We cannot go to sleep one night thinking that Sadia, Aracruz, Votorantim and Vicunha are in a good situation, only to find out, in the next morning, that they, themselves, do not know the extent of their losses."

Until the disclosure of the companies' losses, the reduction in foreign capital inflows, higher outflows and the deterioration of the trade balance were the main transmission channels of the international crisis to emerging economies. But, uncertainty about the solvency of large industrial enterprises due to losses with FX derivatives played a crucial role to the emergence of confidence crisis, almost similar to that prevailing in developed economies, putting additional pressure on the exchange rate Moreover, companies started buying foreign currency, either to honor future contracts with suppliers of imported parts and raw materials, or in an attempt to cover their losses in FX derivative markets, which triggered even more the Brazilian currency depreciation and worsened those losses. A process of loss of trust in the companies was observed, due to their operations performed in opaque markets. This meant larger difficulties in securing new loans or renewing old ones, not just because those companies lost credibility with the banks for making "unknown" operations, but also because they endangered, in a great measure, their future profits, destined to the payment of those debts

On their side, banks were involved, either as direct counterparts in FX OTC derivatives, or in credit operations linked to FX derivatives, or still as creditors in regular loans. In those three cases, they faced a significant credit risk. For not knowing the degree of exposure of other banks to the risk of losses in these OTC operations[84], banks withdrew credit, not only to companies and individuals, but also to

one another in the interbank market (Prates and Cintra, 2010). In other words, banks set in motion a movement of absolute risk aversion and liquidity preference.

Therefore, in the case of Brazilian economy, FX derivatives were the financial innovation that amplified the contagion effect of the crisis, increasing its financial fragility. As detailed above, institutional and macroeconomic features have reinforced the already key role of this class of derivatives in emerging countries, whose currencies are positioned at the lower end of the currency hierarchy. Hence, on the contrary of the epicenter of the crisis (the US) and other advanced economies, credit derivatives (i.e, Credit Default Swaps – CDS) were not important in Brazil. It's market was very thin and illiquid, mainly because even though banks demanded protection against credit risks, very few agents were willing to sell this protection for a premium much lower than the interest rate paid by public bonds that carries an inferior risk.

Yet, the financial fragility did not turn into a financial crisis around the countercyclical measures launched by the Brazilian government[85], among which stands out the actions taken by the three major federal public banks (Banco do Brazil -BB, Caixa Econômica Federal - CEF and Banco Nacional de Desenvolvimento Econômico e Social -BNDES), which extended more credit to firms and families, as private banks reduced their offer. It is worth it mentioning the Provisionary Measure n. 443 of October 21, which authorized BB and CEF to acquire participation in financial institutions based in Brazil. On the basis of this measure, BB bought Votorantim Bank, avoiding its bankruptcy. Moreover, the government increased the capital of BNDES to boost its capacity and grant loans, and announced a series of initiatives that together provided BRL 19 billion for various sectors through these banks, avoiding a sharp drop of credit operations and, consequently, of the economic activity in a context of high liquidity preference of private banks. Finally, BNDES performed

a coordination role in the process of debt restructuring, and/or rolling over of companies that incurred huge losses from FX derivatives (Prates, 2010). As Minsky (1993) points out, the fragility of an economy will also be determined by the institutions in place, and by their ability to increase liquidity when needed.

The contagion effect of the global financial crisis also disclosed shortcomings in the FX derivatives regulation. On one hand, these losses could not have been previously assessed by their shareholders. On the other hand, banks faced credit risks because of loopholes in the regulations and lack of transparency due to the nonconsolidation of each agent's derivative positions.

In order to fix those problems, at the end of 2008 the CVM issued Statement 475/08, in combination with Resolution 566/08, and both disseminated the data regarding derivatives more transparent, and facilitated the analysis of firms' accounting exchange-rate exposure[86]. New accounting rules were also adopted in Brazil, in accordance with the recommendations of the Comissão de Valores Mobiliários - CVM (Brazilian Securities and Exchange Commission), among which the one that deals with the financial instruments stands out; such instruments extend from the exotic derivatives to any receivables (Valenti, 2009). Under the new rule, issued in December 2008, the disclosure of the table of sensitivity analysis in three different scenarios, which used to be optional, as in the balance of the third quarter, became mandatory, in the annual balance of 2008 (Valenti & Fregoni, 2009). Moreover, in November 2009 the BCB established mandatory registration of financial derivatives linked to foreign loans (Circular 3.474). According to the director of relationships with participants of Cetip, Jorge Sant'Anna, the objective of the derivatives center is to disclose information about the companies' negotiations with derivatives, in a way that the participants of the market could evaluate the consolidated risks (Pavini & Carvalho, 2009).

Nonetheless, important measures regarding the improvement of FX derivatives regulation were taken when the contagion effect had already been overcome, and a new boom of capital flows to emerging economies arose. The very post-global-crisis scenario, combined with domestic factors (mainly the resumption of economic growth, the depth and liquidity of capital and derivatives markets, and still high interest rates by international standards) resulted in large capital inflows and strong appreciation pressures between 2009 and the third quarter of 2011. Indeed, Brazil became the main destination for capital flows in Latin America in that period (IMF, 2011; Fritz and Prates, 2014).

The first measure was, indeed, a private initiative. In December 2010, the Brazilian Bank Association (Febraban) established the Centre for Exposure in Derivatives (CED in the Portuguese acronym), which was the most important step to address the shortcoming in transparency in the domestic derivatives market (Prates, 2014).

The other ones were part of a set of measures launched between 2009 and 2011 aiming at curbing the appreciation pressures on the Brazilian currency caused by the resumption of canonical and derivatives carry trade operations over the new boom of capital flows. As during the optimistic wave that took place before the global crisis (see section III), the FX derivatives market played a central role in the trajectory of the Brazilian currency during that boom. On the other side, on the contrary of the pre-crisis boom, the Brazilian government, in tandem with many other emerging countries, chose not adopting a hands-off approach to capital inflows. Although the FX derivatives regulations adopted over that period had a cyclical or macroeconomic aim (hinder the FX derivatives carry trade), they changed in a definitive or structural manner the FX derivatives institutional framework, as detailed in the following.

The institutional specificities of the Brazilian FX market have presented Brazilian policy makers with greater challenges than those faced by their counterparts in other economies with similarly large derivative markets, such as South Korea. Firstly, besides having had to address the low efficacy of capital controls in dealing with FX derivatives operations (due to their high degree of leverage, as to be carried out it requires only a margin requirement), Brazilian authorities have also had to take into account the possibility that those operations could simulate the impact of capital flows on the exchange rate without any effective foreign currency flows. Secondly, prudential financial regulation is also insufficient, because it encompasses only financial institutions, not reaching corporations and foreign investors, who are also important agents (mainly the latter) in the FX Future market. It is worth it mentioning that in Korea prudential regulation curbing FX derivatives operations which are concentrated in the OTC market was sufficient, where banks are the counterpart of corporations in the FX contracts, where gains or losses are liquidated in US dollars (i.e, deliverable). Thus, prudential financial regulation has been sufficient for curbing currency appreciation and financial fragility.[87]

In this setting, the first two FX regulations were adopted along with the tightening of capital controls (see Table 3). The most important for the FX derivatives market institutional framework has been the agents to meet their second one, which prohibits margin requirements in BRL via domestic borrowed securities or guarantees from local banks. On their side, the IOF's increase had a macroeconomic aim, namely, to stem the derivatives carry trade. Yet, it had a low efficacy due to the latter's high degree of leverage and the regulatory arbitrage set in motion by banks and nonresident investors to circumvent the tougher price-based capital control. Indeed, the higher IOF on capital inflows encouraged the derivatives carry trade (build-up of long BRL/short USD positions in the FX derivatives market) by nonresidents. But this was only possible

because resident dealers' banks assumed the contrary position of nonresident investors in the derivatives market (short BRL/long USD) and, simultaneously, increased their short positions in the spot market. It is worth remembering that banks need to fulfill prudential financial regulation requirements, and are the sole institutions able to carry USD positions in the Brazilian spot currency market.

Table 4. Capital controls, prudential regulation and FX derivatives regulation

Date	Number	Tighten	Measure
	and Kind ⁽¹⁾	or Loosen	
October 2009	1 ⁰ CC	Tighten	2 percent financial transaction tax (IOF in the Portuguese acronym) on non -resident equity and fixed income portfolio inflows.
October 2010	2 ⁰ and 3 ⁰ CC	Tighten	(i) IOF increased from 2 to 4 percent for fixed income portfolio investments and equity funds.(ii) IOF increased to 6 percent for fixed income investments.
October 2010	11 ⁰ and 2 ⁰ FXDR	Tighten	(i) IOF on margin requirements on FX derivatives transactions increased from 0.38 to 6 percent.(ii) Loopholes for IOF on margin requirements closed.
January 2011	1 ⁰ PR	Tighten	Non-interest reserve requirement equivalent to 60 percent of bank's short dollar positions in the FX spot market that exceed USD 3 billion or their capital base.
March 2011	4 ⁰ CC	Tighten	Increased to 6 percent the IOF on new foreign loans with maturities of up a year.
April 2011	5 ⁰ CC	Tighten	 (i) 6 percent IOF extended for the renewal of foreign loans with maturities of up a year. (ii) 6 percent IOF extended for both new and renewed foreign loans with maturities of up to 2 years.
July 2011	2 ⁰ PR	Tighten	Non-interest reserve requirement mandatory for amounts over USD 1 billion or capital base (whichever is smaller).
July 2011	3 ⁰ FXDR	Tighten	 (i) Appointment of the Monetary Council of the Brazilian Central Bank (CMN) as the agency responsible for regulating the derivatives market. (ii) Requirement that all FX must be priced according to the same method. (iii) Requirement that all FX derivatives must be registered in clearing houses. (iv) Requirement that FX exposure of all agents must be consolidated (liquid position). (v) Implementation of a 1 percent financial tax on all agents' excessively long positions on BRL. This tax can be increased to 25 percent.
December 2011	6° CC	Loosen	IOF on equity and fixed income (linked with infrastructure projects) portfolio inflows reduced
March	7 ⁰ CC	Tighten	(i) 6 percent IOF extended for both new and
Source: Own elaboration based on Central Bank's and Minister of Finance's websites.

Note: (1) FX = Foreign exchange; CC = Capital Control; PR = Prudential Regulation; FXDR = Foreign Exchange Derivatives Regulation.

To close this loophole, the BCB imposed a noninterest reserve requirement, a prudential financial regulation tool, on bank short positions in the sport market in January 2010 (see table 3). Nevertheless, by switching to short-term foreign borrowing, companies and mainly banks were able to find another channel for regulatory arbitrage. As a regulatory response, the government imposed the IOF on short-term foreign borrowing in March 2011. However, as these private agents were able to make longer-term loans in the context of excess of liquidity, and searching for yield in the international financial market, the government subsequently extended the IOF to these loans.

As the measure taken until April 2011 had only curbed the pace of currency appreciation, the Brazilian government launched a broader set of FX derivatives regulation at the end of July 2011. The government imposed a financial tax of 1 percent on excessively long positions on BRL in the FX derivatives market; at the same time, it adopted new rules to improve the market's transparency (see Table 3).

Final remarks

The optimistic period hid growing macroeconomic imbalances in Brazil. Those lingering problems started to assert themselves in May 2013, after the announcement of Ben Bernanke, president of the Federal Reserve (Fed), that the quantitative easing program would be progressively reduced till it ended (the so-called tapering). The effects of the expected change in the Fed monetary policy were felt around the world, but more acutely in emerging economies. Among them, Brazil experienced the sharpest devaluation of its currency.

Facing capital flight, Brazilian government suspended all the measures destined to reduce the inflow of foreign capital, and curb the FX derivatives carry trade. Furthermore, it did not resort to any plain vanilla spot market auctions to ensure smoother variations of the exchange rate market but rather, implemented a new program of currency swap contracts that trade the FX variation (plus a local onshore USD interest rate) for the cumulative domestic interest rate (Kohlscheen and Andrade, 2013). It included daily auctions of swaps for the notional value of USD 500 million. The amount fell to \$ 200 million per day in January 2014.

This program was successful in stemming the currency depreciation for more than a year. In other words, this was a period in which banks that were buying those swaps from the monetary authority registered losses, and the BCB earned revenues. But shortly before the presidential election of October 2014, market's participants risk aversion worsened both for political and economic reasons, and the foreign exchange rate of the real plunged. From that moment on, BCB accumulated financial losses on its position in currency derivatives which would eventually be translated into fiscal expenses.

The economic policy of the reelected government underwent major changes, taking a more orthodox approach with fiscal austerity at its

center, and a non-proclaimed aim of minimizing interventions through swaps to restore an almost purely floating exchange rate regime. The change has begun in January 2015, with the reduction of the daily supply of FX swaps to an amount varying between USD 50 million and USD 100 million per day. In March, the emission of new swaps was halted, although the renewal at maturity of the existent swaps was assured. At a hearing at the Senate, the president of the BCB, Alexandre Tombini, declared that he believed that "the total amount of USD 114 billion is sufficient to allow the private sector to survive and not going bankrupt because of the exchange rate" (Ribeiro and Marques, 2015). Then, in May, BCB announced that it would reduce by 20% the amount of these renewals.

It seems that the president of the BCB is right. Up to now, the available information indicates that over the post-crisis boom of cross-border finance, neither banks nor corporations engaged into high risk operations linked to FX derivatives, as happened in the precrisis. Hence, the enhancement of the FX derivatives regulation framework after the global crisis was efficient in curbing the rise in the economy financial fragility, which is only brought to light when the burst comes.

However, it is worth it to mention that the FX derivatives regulations launched over the new optimistic wave were ineffective to stem the currency depreciation, when the cross-border finance cycle unwound. In a setting of flight to quality (i.e, to U.S Treasury bonds) and high-risk aversion, the removal of the regulatory toolkit, which only penalizes bets in favor of the BRL, was virtually harmless to bring down the rise in the BRL/USD exchange rate. As during the boom, in the bust phase the changes in investors' positions in the foreign exchange future markets were the main determinant of the BRL trend. Indeed, the withdrawal of the IOF on long positions in June 2013 made the portfolio adjustment easier to short-term positions, which means bets on the BRL depreciation. Only a symmetrical

financial tax on both excessive short positions (i.e, a foreign exchange derivatives regulation which penalize bets on the BRL depreciation) could restrain the volatility generated in the different phases of cross-border finance process.

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Chapter 4 Notes

[62] Lejot et allii (2008) shows that, although securitization in the region is modest compared with Europe or North America, it "increased markedly in parts of Asia after 2000—notably in Hong Kong, China; Japan; Korea; and Malaysia—in each case with housing loans used as raw material, and in Singapore through transactions supported by commercial property. Critically, securitization became a strikingly valuable tool for Korea as part of extensive corporate and financial sector post-crisis restructuring, when new legislation allowed large volumes of NPLs and other impaired financial claims to be employed as collateral for new CDOs, a process of recycling defaulted claims instrumental in the recuperation of the wider Korean economy. At the same time, completed securitization volumes in the PRC, Indonesia, Philippines, and Thailand remain very limited".

[63] Scattigna and Tovar (2007) points out that "securitisation in Latin America has expanded rapidly in the last five years. However, the small average size of issues and their lack of secondary market liquidity suggest that the market for securitised assets remains in its infancy".

[64]See Fritz, Prates e Paula (2014) and Cohen (2009).

[65] Cross-border finance encompasses both capital flows – portfolio investment and bank loans which result in spot currency markets' operations - and operations with Foreign exchange (FX) derivatives.

[66] The BM&F merged with Bovespa, the main Brazilian stock exchange on 25 March 2008.

[67] According to Avdjiev, Upper and von Kleist (2010), the Brazilian real was the second-most traded currency worldwide in the organized derivatives markets in 2010, while the financial volume of FX derivatives traded onshore OTC markets were lower (USD18 billion in April 2010) than in other emerging markets, such as Korea.

[68] However, it is worth noticing that according to the IMF (2002) Hong Kong, Singapore and South Africa have the most liquid currency OTC market, with average daily turnover significantly higher than the spot market

[69] FX bank accounts are allowed only for embassies, multilateral institutions and assurances companies that deal with foreign trade. However, their use is very limited (http://www.bcb.gov.br/?RMCCI).

[70] On the Real Plan, see Batista Jr. (1995), Kregel (2000) and Singh et al. (2005).

[71] Besides being used in the calculation of daily margins, the settlement price is often considered as a representative of the movement of the day.

[72] The NDF is conceptually similar to a simple forward transaction in which the parties agree to a principal amount (or notional) a settlement date and a future exchange rate. The difference is there is no delivery at settlement by transfer of the principal. The difference between the exchange rate initially determined and the one effectively verified on the due date is paid in US \$ or other fully convertible currency. See Ma et al. (2004) and Lipscomb (2005),

[73] For a detailled analysis of the similarities and specificities of emerging economies currency crises in the 1990s, see: Kregel (1998 and 2000).

[74] See Akyuz (2010).

[75] For a overview of this context, see Ocampo (2007)

[76] Another important measure, which did not change the FX market institutional framework, was launched on February 2006. The Lula administration exempted foreign investment in public bonds and venture capital funds from income.

[77] See: http://www.bcb.gov.br/?RMCCI.

[78] Most of the spot FX transactions are settled by transfers of funds between residents foreign accounts. The exception is the purchases and sells of foreign currencies related with international travels. In this case, the physical flow is allowed (http://www.bcb.gov.br/?RMCCI).

[79] On the NDF market of emerging economy currencies, see Ma, Ho and McCauley (2010).

[80] "One important way firms may have cut the exposure to currency risk has been the growing reliance on financial derivatives to hedge currency risk" (IMF, 2008, p. 55)

[81] On September 30, 2008, after having liquidated a significant portion of its positions, Sadia still presented a short liquid position was of USD 2.37 billion. In December 2008, the foreign exchange exposure of the company with pending contracts decreased to USD 678 million, which were equivalent to less than three months of export (Barbieri, 2008).

[82] Created by the financial institutions and the Central Bank, Cetip S.A. – Balcão Organizado de Ativos e Derivativos (Organized Counter of Assets and Derivatives) - began its operations in 1986. It is an association for the administration of organized over-the-counter markets, that is, of platforms for negotiation and registration of securities, public and private bonds and over-the-counter derivatives.

[83] For detailed description of these contracts and their role as one of the main transmission channel of the global crisis in Brazil, see Farhi and Borghi (2009), Farhi (2010), Kregel (2011), and Prates and Cintra (2010).

[84] Unibanco, one of the major national private banks, incurred with large losses in FX derivatives operations and was acquired by Itaú in November 2008.

[85] On the Brazilian government response to the contagion effect of the global financial crisis, see Cunha, Prates & Ferrari (2012).

[86] For more information on these changes, see Rossi Júnior (2011).

[87] For a detail analysis of the Korean and Brazilian response to the post-crisis optimistic wave and the new approach of the IMF with regards to capital controls, see Fritz and Prates (2014).

5. Why Does Brazil's Banking Sector Need Public Banks ? What Should BNDES do ?

Felipe Rezende

I. Why does Brazil's banking sector need public banks?

Rather than justifying the existence of public banks, and BNDES in particular, using an argument based on market failures (Garcia 2011), an effective answer to this question requires a theory of financial instability. The 2007-2008 global financial crisis had a profound impact on the state of modern economics. It exposed the failure of mainstream economics, and led to some understanding of the inherent instability of capitalism and how to prevent depressions. Moreover, the conventional approach had disastrous economic policy consequences that contributed with the Great Recession. Entering the global crisis, mainstream economists believed "the state of macro is good" (Blanchard 2009, p.2). People who were believed to have a sophisticated understanding of economics did not understand what we were getting into during the bubble years, and they repeatedly dismissed ample warnings about growing financial fragility and instability in the economy. For example, Arminio Fraga, ex-president of the Central Bank of Brazil from 1999–2002, and currently a hedge

fund manager, proclaimed the following in 2005 during the Jackson Hole Economic Policy Symposium:

We are moving towards more complete markets. Presumably this is a good thing. I do see from my vantage point at the ground level that risk is going where it belongs. It is, in fact, a good innovation because small investors don't like banks to take a lot of risk. So, traders and banks move out to hedge funds, and they are there met by more sophisticated investors. Banks in the old days were paid to grow their loan books, I can't think of a worse incentive, and that is the way they were compensated...Investment managers today, however risky their business may be, tend to care about their reputations and tend to have their money on the line. That is healthy and it is being delivered by the market on its own...As an investor, I have a pretty easy time looking at funds and figuring out what they are doing. It is nearly impossible to know what the large financial institutions we have in this planet are doing these days...That is, in my view, probably an argument to say we may be better off than before...Perhaps because of all this we see less of an impact of all these financial accidents on the real economy now than we did see in the 1980s, when it took years to clear markets, for banks to start lending again, and for the economies to start moving (Fraga 2005, 389-390).

The unfolding of the global economic crisis has called into question both, the conventional approach and mainstream economists' reputations. In a recent article about the state of macroeconomics, the IMF's chief economist Olivier Blanchard, confessed where danger really lurks, that is, in the minds and models of an orthodox economist. He acknowledged that "[traditional models have] a worldview in which economic fluctuations occurred but were regular, and essentially self-correcting. The problem is that we came to believe that this was indeed the way the world worked" (Blanchard 2014:28). As Wray (2011) pointed out:

The global crisis exploded reigning orthodoxy. Among those theories and claims that should no longer be taken seriously by any macroeconomist, we must include: rational expectations and continuous market clearing; New Classical and Real Business Cycle approaches; neutral money; the New Monetary Consensus, the Taylor rule, and the Great Moderation; the Efficient Markets Hypothesis; Ricardian equivalents and other versions of the policy irrelevance doctrine; and claims made by advocates of deregulation and self-regulation. To be sure, we have been here before. The Great Depression also exploded the reigning orthodoxy. Keynes offered a revolution in thought. Unfortunately, that revolution was aborted, or, at least, co-opted by "synthesizers" who borrowed only the less revolutionary aspects of his theory and then integrated these into the old Neoclassical approach. The important insights of Keynes were never incorporated into mainstream macroeconomics. Eventually, Neoclassical theory was restored. It is now time to throw it out, to see what should be recovered from Keynes, and to update Keynes's theory to make it relevant for the world in which we actually live (Wray 2011, p.7).

Why is this discussion important? During the pre-crisis period, developed countries' regulatory systems had been considered as "best practice", and formed the basis for recommendations to developing countries seeking to liberalize and expand their domestic financial markets. Once more, the crisis fatally discredited notions that free-market economies are inherently stable. It discredited the belief in self-regulation and supervision, and in arguments against regulation, based on the idea that markets would undertake due diligence resulting in optimal outcomes, and that market prices act as signals that agents react to, in a Pareto-optimal manner. The crisis has shown the failure of private finance to efficiently allocate capital to finance real capital development.

The Great Recession called into question the "light touch" regulatory approach practiced in the US and the UK, and produced an ad-hoc response to the financial crisis. In spite of massive expansion of central banks' balance sheets in developed economies aimed at bailing out financial institutions and their intervention in private credit markets, it had little impact in terms of increasing credit to the private non-bank sector. The crisis response has raised two fundamental questions.

First, the regulatory and supervisory framework put in place in advanced nations before the 2007–2008 global financial crisis failed to capture and avoid the buildup of financial fragility in the economy. While the mainstream view of finance, and the proper regulatory approach have been called into question, Minsky's alternative approach provides a framework to investigate structural changes in the domestic financial architecture, and help the appropriate designing of the existing regulatory and supervisory policies constrain the development of financial fragility in the economy and deal with severe systemic crises (Kregel 2014). In this approach, the destabilizing effects of stability on financial structures calls for dynamic adjustments to policy frameworks, and brings about the need to redesign the regulatory structure to continually meet its objectives of financial stability and provide funding for development and financial stability and provide funding for development

Second, to the extent that the financial structure that emerged in the US financial system in the past 30 years failed to provide support for the capital development of the economy and improve living standards, an alternative design of the financial structure that meets the needs of developing nations needs to be developed. For example, the UNCTAD report noted the following:

At present, flaws in credit allocation by deregulated private banks and difficulties in reestablishing the supply of credit for the real sector in developed economies (despite expansionary monetary policies) have led to a renewed interest in credit policies. As in July 2012, the Bank of England established a temporary Funding for Lending Scheme, with the goal of incentivizing banks and building societies to boost their lending to the country's real economy...The Bank of Japan had launched a similar initiative in 2010...However, these initiatives are frequently introduced as extraordinary measures for dealing with exceptional circumstances. There are strong arguments in favor of central bank and government intervention to influence the allocation of credit in normal times, especially in developing countries. Such credit should aim at strengthening the domestic forces of growth and reducing financial instability, since long-term loans for investment and innovation and loans to micro, small and medium-sized enterprises are extremely scarce, even in good times (UNCTAD 2013, p.134-135).

In this regard, the resilience and stability of Brazil's financial system has received attention as it navigated relatively smoothly through the 2007-2008 global financial crisis and the collapse of the shadow banking system (Kregel 2009). In this regard, I will use Minsky's framework to examine the role played by the Brazilian National Development Bank (BNDES) in financing long-term development, how to finance it, and the government's role in direct provision of financial services. It builds on Minsky's instability theory, and the role of the "Big Bank" in constraining instability and his approach to reorienting finance to promote capital development of the economy. In his 1986 book, Stabilizing an Unstable Economy, Hyman Minsky emphasized that the instability of financial markets is a normal outcome of capitalist economies. Contrary to the mainstream view, finance is not a scarce resource. That is, finance is created simultaneously as banks take positions in assets by issuing liabilities, which depends on banks' willingness to accept the liabilities of the household and business sectors.

One of the key components of economic development is to allow bankers to act as the ephors of the economy, to promote its capital development. However, the purchase of assets through the issuance of debt is a major destabilizing influence in a capitalist economy, and represents the core to Minsky's financial instability theory. Even though he noted that in a capitalist system endogenous financial fragility and instability will always exist, his framework stresses the impacts of Big Government and the Big Bank, by putting ceilings and floors on economic activity. Moreover, in his framework state-owned banks and national developments banks could dampen instability. This regime of intervention "stabilizes the unstable system."

II. Why does Brazil's banking sector need BNDES?

There has been much discussion about how to support private longterm finance to meet Brazil's growing infrastructure and investment needs[88]. One of the essential functions of the financial system is to provide long-term funding needed for long-lived and expensive capital assets. However, one of the main challenges posed by the current private financial system is its failure to provide long-term financing. The short termism in Brazil's financial market is a major obstacle to financing long-term assets. In its current form, the National Economic and Social Development Bank (BNDES) is the main source of longterm funding in the country (Torres Filho and Costa, 2012). In this regard, the chapter "Mobilizing domestic financial resources for development," paragraph 18, of the Monterrey Consensus noted that "Development banks, commercial and other financial institutions, whether independently or in cooperation, can be effective instruments for facilitating access to finance, including equity financing, for such enterprises, and an adequate supply of medium- and long-term

credit" (Monterrey Consensus). To this end, UNCTAD's 2013 Trade and Development Report noted that:

Public intervention in the provision of bank credit will be especially important in developing countries that aim at strengthening domestic forces of growth, since long-term loans for investment and innovation, as well as loans to micro, small and medium-sized enterprises are extremely scarce, even in good times. Commercial banks in developing countries often prefer to grant short-term personal loans, or to buy government securities, because they consider the risks associated with maturity transformation (i.e. providing long-term credits matched by short-term deposits) to be too high...National development banks may provide financial services that private financial institutions are unable or unwilling to provide to the extent desired (UNCTAD, Trade and Development Report, 2013, p. XVII, emphasis added).

As the 2007–2008 Global Financial Crisis unfolded, BNDES sharply increased its balance sheet, mainly due to massive National Treasury loans to the Brazilian Development Bank (figures 1 and 2). It allowed BNDES to expand its balance sheet to meet Brazil's long-term investment needs, and counter financial instability.[89]

Figure 1: BNDES Total Assets



Source: BNDES

Figure 2: BNDES Funding from the National Treasury and Funds Received from the Workers' Assistance Fund (FAT-Fundo de Amparo ao Trabalhador)



Source: BNDES

In Brazil, since the onset of the crisis, public banks play three basic roles:

- Act as a counter cyclical policy tool;
- Provide financing for developing to enhance productivity growth, support for socioeconomic infrastructure, and knowledge-specific activities; and
- Promote the development of organized liquid capital markets. The expansion of public banks' balance sheets allowed policymakers to counter financial instability, by sharply expanding credit growth when private sector (domestic and foreign) banks reduced bank lending (Figures 3 and 4).



Figure 3: Counter-cyclical Lending Stabilized the System (YoY %)

Source: BCB

However, BNDES has been subject to a range of criticisms. The bank's critics make the following complaints:

 BNDES "crowds out" corporate lending by private sector banks; BNDES loans provided at subsidized rates generate unfair competition with private banks due to BNDES's funding structure (Wheatley 2013);

- BNDES is curbing the development of the financial sector; the bank has grown too big too fast, emergency countercyclical policies implemented have gone on for too long (Forero 2013); and
- Loans from the National Treasury increase gross domestic debt, and it contributes with the weakening of Brazil's sovereign's financial profile, deteriorating the National Treasury fiscal performance, and with a rise in the government's debt burden.



Figure 4: BNDES Disbursements

Source: BNDES

Much of the policy discussion has been misplaced. The critics ignore the historical role national development banks play in fostering development at different stages of economic growth (UNCTAD 2013, p. 133–134). Even though Brazil's banking sector has roughly doubled its lending as a share of GDP, the balance sheet profile of public and private banks reinforces the role of BNDES in promoting economic development through financing of long-term capital assets. It is ironic that critics say that "large companies have access to financial and capital markets, in Brazil and abroad" (Musacchio & Lazzarini 2014) to downplay BNDES's role in providing funding for development, when the costs of funds raised locally are substantially higher than the rate BNDES charges on its loans and funds raised abroad, which contribute significantly to external vulnerability.

It is not surprising that economists often forget history. In the past, Brazil's increased external debt levels raised the country's vulnerabilities to changes in external conditions. Against this background, BNDES plays a significant role in reducing external risk and external funding shocks—one of the root causes of the debt crisis among developing countries in the 1980s, followed by the so-called "lost decade"—by reducing firms' reliance on foreign markets as firms' liabilities can be locally funded. The bank could be criticized for not doing enough, in particular for Brazil's total investment infrastructure and innovation (figures 5 and 6). Despite its growing investments in infrastructure, it is still small, relatively to Brazil's infrastructure investment needs. In 2013, 33% of BNDES total disbursements were towards infrastructure investment.

Figure 5: Disbursements by Sector



Source: BNDES

Figure 6: Federal Government Support of Innovation[90] (Current R\$)



For instance, the background document of the Financing for Development Office of The United Nations Department of Economic and Social Affairs (UN-DESA) noted that "from the time when the China Development bank was established in 1994 to the end of 2005, nearly 90% of its lending was directed towards infrastructure in eight key industries - power, road construction, railway, petro-chemical, coal mining, telecommunications, public facilities, and agriculture" (United Nations, 2005, 16). President Dilma Rousseff acknowledged "Brazil is 'two centuries' behind when it comes to building its rail network" (Leahy 2013). Brazil's transport and logistics networks face many challenges. In an attempt to boost investment, Brazil has introduced a series of policy initiatives, such as the Growth Acceleration Program (PAC 1 and 2), the BNDES Investment Maintenance Program (BNDES's PSI), the National Plan for Transport Logistics (PNLT), and it is offering public concessions to the private sector in three key areas: logistics including roads, railway, ports and airports; energy; and oil and gas. According to Brazil's finance minister, expected investments equal a total USD \$235 billion over the coming years (Table 1).

 Table 1: Concessions Program Estimated Investment

Concessions Program	Estimated Total Investment (US\$ billion)
Logistics	121
Roads	21
Railways	45.5
Ports	27.3
High Speed Train	17.8
Airports	9.4
Energy	74
Hydro	39.9
Wind, Biomass, and Small Hydro	19
Thermal	1.4
Distribution	13.7
Oil & Gas	40
Total	235

Source: Ministry of Finance

Though it is commonly believed that BNDES led to the crowding-out of debt markets from corporate financing, and private banks from long-term financing loans, because the rate it charges on its loans to firms is less than the central bank's benchmark SELIC (Special System of Clearance and Custody) overnight interest rate, the short termism in Brazil's financial market is primarily due to a high and volatile SELIC rate. During the new millennium, Brazilian banks enjoyed a great situation by holding high-quality, high-yield, shortterm assets. Due to Brazil's consistently high benchmark SELIC rate, the full risk-adjusted return on liquid assets more than offset the full return on less liquid assets, such as consumer and business loans. It shifted banks' portfolio composition towards high-quality short-term liquid government securities holdings and other high-yield, lowduration assets on banks' balance sheets. Moreover, corporate lending by private banks is expensive, so funding capital expenditure from private banks is not an option, and its high cost deters investment in capital assets.

This period was characterized by large holdings of government securities on banks' balance sheets, and low exposure to traditional loan products. According to central bank data, as of August 2014, State-controlled banks are responsible for 53% of outstanding loans in Brazil, while the share of local private-sector banks decreased to 32%, as they have sharply reduced loan origination over the past few years.[91] Even though banks increased claims on the private sector, as the central bank lowered its benchmark rate to record lows, and have roughly doubled their lending as a share of GDP, the supply of long-term credit by private institutions remained low (Table 4).

Though it has been argued that Brazil's private-sector banks cannot with BNDES's below-market compete rates for lona-term investments, much of the policy discussion has been misplaced, missing the fact that Brazilian banks (and to some extent BB and CEF) operate with extremely high loan spreads, low moderate leverage ratios, and generate high returns on equity (Table 3). The spread between short-term lending rates for business and consumer loans and commercial banks' funding costs is substantially higher relative to long-term financing activities[92]. High returns on government securities, combined with abnormally high loan spreads on short-term loan products, generate extremely high returns on equity for private banks and for BB and CEF. This situation resulted in a risk-adjusted spread of short-term loans, which is greater than the risk-adjusted total returns of financing long-term assets. As a result, Brazil's banking sector shifted its portfolio preferences towards highyield, short-term assets and generates high returns on equity with low leverage compared to international peers. BNDES's competitive advantage is not due to its funding structure, but it is primarily because it operates with low loan spreads (for direct lending operations, the BNDES spread is equal to its financial funding costs plus its return and a risk premium, as opposed to traditional private banks, which operate with extremely high loan spreads, high

operational costs, low leverage, and high delinquency rates to generate high ROE (tables 3 and 4).

BNDES vs. Multilateral Agencies									
		Inter-American World		China Development					
	BNDES	Development Bank	Bank	Bank					
(US\$ million)	June/2014	Ju ne/2014	June/2014	Dec/2013					
Total Asse ts	369,745	99,454	324,367	1,352,450					
Equity	33,658	24,022	39,523	92,828					
Net Income	2,484	235	218	13,197					
Disbursement	26,697	3,014	16,03	N/A					
Capitalization (%)	9.1	24.2	12.2	6.9					
ROA (%)	0.7	0.2	0.1	1					
ROE (%)	8.5	1	0.6	15.1					

Table 2: BNDES and Multilateral Agencies

Source: BNDES financial disclosure, June 2014

Although the conventional approach believes that Brazil's financial system lacks saving and financial instruments to foster long-term investment, the primary difficulty in fostering long-term funding among private sector banks is the unattractiveness of long-term lending relative to other short-term loan products, which generate abnormally high loan spreads for consumer loans, such as payroll deductible loans, auto loans, and loans to firms, such as working capital loans, and SME loans. From this perspective, high short-term loan spreads distort credit markets. Moreover, privately owned banks have little interest in expanding their long-term loan business portfolios to provide long-term financing. In 2012, Rousseff's administration mandated that State-controlled banks should reduce consumer lending rates to encourage private banks to follow suit. This episode illustrates the need for competition from State-owned banks to

encourage private domestic banks to shift their portfolio to promote real capital development. The Brazilian financial system does not lack funding mechanisms, but the difficulty is the high level and volatility of interest rates and the unattractiveness of low-risk adjusted returns on long-term assets relative to other high-yield, short-term loan segments in the presence of low-leveraged bank balance sheets, which dampens the development of a long-term credit market. Hence, domestic private banks have little interest in expanding their longterm loan business portfolios to provide long-term financing.

	BNDES	BB	CEF	ITAÚ	BRADESCO	WORLD BANK	IADB	KFW	China DB
Return on Equity (average)(ROE)(%p.a)	14.5	23.4	22.3	16.2	17.0	0.6	5.9	3.8	13.4
Net income (R\$ billion)	8.2	16.0	6.7	13.9	12.0	0.5	2.9	2.0	19.8
Average equity (R\$ billion)	56.4	68.4	30.2	85.9	70.7	80.7	48.5	52.0	147.4
Return on asset average (ROA)(%p.a)	1.1	1.4	0.9	1.4	1.6	0.1	1.4	0.1	0.9
Total Assets (R\$ billion)	781	1219	858	1027	777	719	227	1517	2465
Total Average Assets (R\$ billion)	747	1153	781	989	766	702	207	1430	2155
Average Leverage	13.3	16.8	25.8	11.5	10.8	8.7	4.3	27.5	14.6
Basel Ratio (%)	18.7	14.5	15.1	16.5	16.6	N.A.	N.A.	N.A.	N.A.
Gross Interest Margin (Gross income from financial intermediation / Average Fixed Income Portfolio) (%p.a)	2.00%	2.60%	2.60%	3.60%	3.00%	0.70%	1.90%	-0,20%	2.30%
Gross income from financial intermediation (R\$ billion)	12.5	25.0	19.2	28.3	19.5	4.8	4.0	-2,3	49.9
Gross income (excluding allowance for credit risk) (Gross income from financial intermediation excluding allowance for credit risk / Average Fixed Income Portfolio) (%p.a)	1.90	4.20%	3.90%	6.00%	5.10%	0.70%	2.0%	-0,20%	2.30%
Intermediation (excluding allowance for credit risk) (R\$ billion)	11.7	41.1	28.4	46.8	32.9	4.8	4.1	-2,3	49.0

Table 3: Key Profitability Indicators

 Table 4: Loans and Onlendings Portfolio

	BNDES	BB	CEF	ITAÚ	BRADESCO	WORLD BANK	IADB	KFW	China DB
Net Portfolio (after allowance for credit risk) / Total Assets (%)	72.4	53.7	66.3	39.3	42.0	43.8	72.6	85.0	90.0
Net Portfolio (R\$ billion)	565	655	569	403	326	315	165	1290	2219
Average Fixed Income Portfolio (Credit and Treasury) (R\$ billion)	624	980	731	778	641	760	206	1430	2205
Long Term Credit Operations / Gross Portfolio (%)	80.8	61.9	75.5	43.6	46.2	96.5	92.8	N.A.	N.A.
Rating AA-C Credit Operations / Portfolio (%)	99.7	95.0	92.8	91.9	92.2	N.A.	N.A.	N.A.	N.A.
Non-performing balance / Gross Portfolio (%)	0.01	1.13	1.36	2.71	2.52	N.A.	N.A.	N.A.	N.A.

Sources: BACEN-Top 50 Reports and Financial Demonstrations. Informations from the years ended on 12/31/2013, 06/30/2013 (BIRD) and 12/31/2012 (CDB) Long Term Credit Operations >1 years

Policy Alternatives to Promote Long-term Financing

As noted earlier, for the past six years, policy makers relied on the expansion of BNDES's balance sheet through National Treasury loans and infusions of capital to fund private sector investment projects. In this regard, the composition of its liabilities changed significantly, and the treasury is currently its major source of funding (Table 5).

 Table 5: BNDES Balance Sheet
						R\$ billion
	2014	%	2013	2012	2011	2010
Cash	2.7	0.3%	0.5	10.3	5.4	10.1
Loans	588.3	72.2%	565.2	492.1	425.5	361.6
Equity Investments ¹	82.4	10.1%	85.8	94.4	99.6	107.5
Securities	98.3	12.1%	91	86.5	73.9	50
Others	42.6	5.2%	39.5	32.3	20.4	19.8
Total Assets	814.3	100.0%	782	715.6	624.8	549
FAT	192.4	23.6%	176.2	161.9	146.3	132.3
PIS/PASEP	33.6	4.1%	33.6	32.8	31.7	30.8
National Treasury	433.2	53.2%	413.2	376	310.8	253.1
International Borrowings	34.7	4.3%	31.2	23.3	22.4	19.8
Others	46.3	5.7%	67.1	69.4	52.6	47.2
Shareholdes Equity	74.1	9.1%	60.7	52.2	61	65.9
Total Liabilities	814.3	100.0%	782	715.6	624.8	549

¹Equity investments in associated and non-associated companies. Since 2010, the investments in non associated companies are adjusted for fair value.

Source: BNDES financial disclosure June-2014

BNDES's balance sheet has expanded primarily due to treasury loans to BNDES, which, as of 2014, represent 53.2% of its liabilities. In Brazil, provisional measures subsequently transformed into law authorize domestic on-lendings to BNDES from the National Treasury, in which the latter issues securities through direct placement to BNDES. This transaction involves the creation of assets for the National Treasury (claims on BNDES) and the corresponding issuance of liabilities—government securities—by the National Treasury. For BNDES, their liabilities increase by the amount of the transfer of securities it holds as assets. This transaction is recorded as an electronic book entry and the net effect on the public debt is zero, though gross debt goes up by the amount of the government securities issued. However, this policy raised several criticisms due to the increase in gross public debt caused by the direct issuance of securities to BNDES.

Figure 7: Public Sector Gross and Net Debt as a Percentage of GDP



Source: Brazilian Central Bank

For this reason, much of the recent discussion about BNDES's role centers around the fiscal costs associated with National Treasury loans to BNDES—which sharply increased since 2009—focusing on whether it produces a net cost or a net gain for the federal government (Garcia 2011b). Moreover, critics point to the negative carry operation for the treasury, as the costs associated with government securities are higher than the TJLP, that is, the rate the Treasury charges on its loans to BNDES. Finally, funding from the National Treasury has been criticized on various grounds, such as "dangerous creative accounting," "accounting gimmicks," "discredited fiscal accounting," and "sequence of assaults on our public accounts" (Garcia 2010).

Though critics of BNDES's balance sheet expansion point to increasing fiscal risk, they fail to understand that the federal government spends by crediting bank accounts and taxes by debiting them. Government expenditures increase reserves in the banking system. The federal government is the only net supplier of reserves, so that when they spend, there is an injection of reserves in the banking system, and when taxes are collected reserves are destroyed. As we have argued elsewhere (Rezende 2009), excess reserves tend to put a downward pressure on the SELIC rate, which triggers the sale of government securities to remove those excess reserves and keep the SELIC rate close to its target. Fiscal operations lead to credits to bank accounts at the Brazilian central bank. As long as the Brazilian central bank operates with a positive SELIC rate close to the target, it must intervene in the market to maintain the SELIC rate close to the target.

Funding Options for BNDES

By using a basic system of accounting in which for every financial asset there is a corresponding liability, we can evaluate and simulate the existing and alternative funding options for BNDES. We can analyze the following alternatives: a) loans from the National Treasury at TJLP to BNDES; b) loans from the Brazilian Central Bank; c) credit to BNDES's reserve account at the central bank using the National Treasury account with the BCB; and d) BNDES issuance of bonds.

a) Loans from the National Treasury to BNDES

In its current form, loans from the National Treasury at TJLP (the long-term interest rate) to BNDES are extended through direct placement of government securities to BNDES, which then sells government securities on its portfolio, as needed to increase its disbursements to provide long-term credit. As BNDES sells

government securities on its portfolio, its reserve account balance with the central bank goes up. As it extends new loans to the private sector, its reserve balance goes down by the amount of the loan, and its loan portfolio increases. This transaction is equivalent to a swap of assets on BNDES's balance sheet. The loan beneficiary's bank account balance goes up, and there is a corresponding increase in reserve balances on the borrowers' bank. Note that the increase in reserve balances will put a downward pressure on the overnight lending rate, triggering the intervention of the central bank through bond sales, to remove excess reserves from the banking system and keep the SELIC rate close to its target.

Figure 8: Loans from the National Treasury at TJLP to BNDES

National T	reasury	 Bì	NDES
Assets	Liabilities	Assets	Liabilities
+ Claims on BNDES	+ Government Securities	+ Government Securities	+ National Treasury Loans

BNDES sells government securities on its portfolio increasing its balances at the Central Bank Account

BNDI	-8		Cent	ral Bank
Assets	Liabilities		Assets	Liabilities
- Government Securities + Balance at the Central Bank				+ Reserve Balances owed to BNDES - Reserves owed to bank
Banl	k	_		
Assets	Liabilities			
- Reserves + Government Securities				

BNDES extends loans to the private sector

BNDI	ES	Cent	ral Bank
Assets	Liabilities	Assets	Liabilities
- Balance at			- Balance owed to BNDES
the Central Bank			+ Reserve Balances owed to
+ claims on the private sector			bank

Ban	k	 Non-Bank	Private Sector
Assets	Liabilities	Assets	Liabilities
+ Reserve Balances at the Central Bank	+ Deposits owed to the non-bank private sector	+ Deposits at bank	+Loans owed to BNDES

_____ BCB sells bonds from its portfolio to remove the excess reserves

Bank			Cent	ral Bank
Assets	Liabilities		Assets	Liabilities
 Reserve Balances at the Central Bank + Government Securities 			- Government Securities	- Reserves owed to bank

Final balance sheet position

BNDES			Non-Bank	Private Sector
Assets	Liabilities		Assets	Liabilities
+ claims on the private sector	+ National Treasury Loans		+ Deposits at bank	+Loans owed to BNDES
National T	reasury		I	Bank

Assets	Liabilities	Assets	Liabilities
+ Claims on BNDES	+ Government Securities	+ Government Securities	+ Deposits owed to the non-bank private sector

So, the final position for each unit is the following: BNDES has an asset (the loan) matched by a liability (loans from the National Treasury); the borrowers' bank holds government securities as assets, and deposits as liabilities; the borrower has increased its liabilities by the amount of the loan from BNDES, and its deposit balance has increased by the amount of the loan. On the consolidated balance sheet of the government, its asset increased by the number of claims of the private sector by issuing liabilities (government securities).

b) Loans from BCB at TJLP

Since last June, BNDES has had direct access to Brazil's payment system (SPB), and it has a reserve account at the central bank to settle payments and transactions. This initiative creates the possibility to provide alternative sources of funding for BNDES. An alternative approach would be to allow the central bank to credit BNDES's reserve account. This funding option is not radically new.

Historically, central banks have used a wide variety of instruments to channel long-term finance in support of development objectives, including direct financing of non-financial firms. Central bank and government intervention in credit allocation became widespread in the immediate post-war period, in developed and developing countries alike (UNCTAD 2013, p.133-134).

In that way, BNDES's assets would go up by the same amount, and its liabilities (borrowings from the central bank) would go up by the amount of the loan. It would allow BNDES to engage into direct lending and would also allow the maturity transformation inside the banking system. By extending loans, BNDES would increase its credit portfolio, and its reserve balance with the central bank would go down. On the other hand, the recipient bank's account balance with the central bank increases, matched by an increase in its deposit liabilities. The loan recipient's account balance at its bank would go up, matched by an increase in its liabilities (loans from BNDES). This increase in reserve balances at depository institutions puts a downward pressure on the SELIC rate, and triggers the sale by the central bank of government securities to drain reserve balances from the banking system to keep the SELIC rate close to its target. This transaction is an asset swap of central bank liabilities for government securities.

Figure 9: Loans from BCB



Note that on the consolidated balance sheet of the government it has an asset—claims on the private sector—matched by an increase in its liabilities (borrowed reserves).

c) Credit BNDES's Reserve Account at the Central Bank using the National Treasury Account with the BCB

In this case, the National Treasury's reserve balances with the central bank go down by the amount of the loan, and BNDES's balance at the central bank goes up by the same amount, matched by a corresponding increase in its liabilities. It can then extend new loans, so reserve balances go down and its loan portfolio goes up. The borrower's account goes up, and its bank reserve balances go up, adding reserves to the banking system, which will put downward pressure on the SELIC rate, triggering securities sales by the central bank.

The final position for BNDES, the borrower, and its bank is the same as in the case in which the Treasury transfers government securities to BNDES.

Figure 10: Credit BNDES's reserve account at the central bank using the National Treasury account with the BCB

National T	reasury	_	Ce	ntral Bank
Assets	Liabilities		Assets	Liabilities
 Reserve Balances at the Central Bank + Claims on BNDES 				 Reserve Balance owed to the National Treasury + Reserve Balances owed to BNDES
BND	ES			
Assets	Liabilities			
+ Reserve Balances at	+ National Treasury Loans			
the central Bank				
BNDI	BNDES extends loans ES		Non-Bar	k Private Sector
Assets	Liabilities	- 1	Assets	Liabilities
 Reserve Balances at the central Bank +Claims on the private sector 			+ Deposits at bank	+Loans owed to BNDES
Ban	- k		Ce	ntral Bank
Assets	Liabilities		Assets	Liabilities
+ Reserve Balances at	+ Deposits owed to the			- Balance owed to BNDES
the Central Bank	non-bank private sector			+ Reserve Balances owed to bank
BCB sells bonds fr	rom its portfolio to remove t	the e	excess reserves	ntral Rank
Assets	Liabilities		Assets	Liabilities
 Reserve Balances at the Central Bank + Government Securities 	Liaonnes		- Government Securities	- Reserves owed to bank

Final Position

BNDES				
Assets	Liabilities			
+ claims on the private sector	+ National Treasury Loans			

Central Bank				
Assets	Liabilities			
- Government Securities	- Balance owed to the National Treasury			

Banks			
Assets	Liabilities		
+ Government Securities	+ Deposits owed to the non-bank private sector		

National	Treasury

Assets	Liabilities
 Reserve Balances at the Central Bank + Claims on BNDES 	

Non-Bank Private Sector

Assets	Liabilities	
+ Deposits	+Loans owed to BNDES	

d) BNDES Issues Bonds Before it can Extend New Loans

In this case, BNDES issues bonds to raise funds to extend new loans. Its reserve balance at the central bank goes up by the amount of the bond sale.

Figure 11: BNDES issues bonds

BNDES		Cen	tral Bank	
Assets	Liabilities	Assets	Liabilities	
+ Reserve Balances at	+ Bonds		- Res. Balances owed to bank	
the central Bank			+ Reserve Balances owed to	
			BNDES	
Ban	k			
Assets	Liabilities			
- Reserve Balances at	25 MOTING O			
the central Bank				
+ Bonds				
	BNDES extends loans			
BNDES		Non-Bank Private Sector		
Assets	Liabilities	Assets	Liabilities	
- Reserve Balances at				
the central Bank		+ Deposits at bank	+Loans owed to BNDES	
+Claims on the private sector				
-				
Bank		Central Bank		
Assets	Liabilities	Assets	Liabilities	
+ Reserve Balances at	+ Deposits owed to the		- Balance owed to BNDES	
the Central Bank	non-bank private sector		+ Reserve Balances owed to	
1			bank	
BCB sells bonds fr	om its portfolio to remove t	he excess reserves		
Ban	k	Cen	tral Bank	
Assets	Liabilities	Assets	Liabilities	
- Reserve Balances at				
the Central Bank		- Government Securities	- Reserves owed to bank	
+ Government Securities		I		
Final Position				
BND	ES			
Assets	Liabilities			
+ alaims on the minute sector	+ Den de			
+ claims on the private sector	T Dollas			
Banks		Non-Ban	Non-Bank Private Sector	
Assets	Liabilities	Assets	Liabilities	
+ Bonds	+ Denosite owed to the	+ Deposite	+Loans owed to PNDES	
+ Donus	+ Deposits owed to the	+ Deposits	+Loans owed to DNDES	
1	non-oank private sector	I		

Note that regardless of the funding alternative, the increase in reserve balances tends to put downward pressure on the SELIC rate, which will trigger the sale for securities to remove excess reserve balances in the system. Moreover, the final balance sheet position is the same in all those funding options: BNDES has a claim on the private sector, the National Treasury (or the central bank) has a claim on BNDES, the firm has a loan, and the bank holds government securities. Note that in the fourth case, the recipient bank has a claim on BNDES, that is, it holds a government liability. These transactions reflect the basic principle that economic units buy assets by issuing liabilities. It reflects the endogenous money approach in which "banks 'create credit,' that is, that they create deposits in their act of lending" (Schumpeter 1954: 1080). Just like Minsky observed, economic units buy assets by issuing IOUs. For Minsky, "Banking is not money lending; to lend, a money lender must have money. The fundamental banking activity is accepting, that is, guaranteeing that some party is creditworthy" (Minsky 1986: 256).

This approach to banking sees money creation as going from banks' assets to liabilities. Banks purchase assets (such as the liabilities of borrowers, IOUs) through the issuance of liabilities (such as deposits, banks' IOUs). The federal government operates in a similar way, as it buys assets (claims on the nongovernment sector) by issuing its own IOUs (either reserves or government securities). This transaction should not be seen as an accounting trick, but rather those funding options presented above represent accounting transactions with government debt (either reserves or government securities).

However, the design and reform of financing mechanisms involves a political choice about how to direct and allocate public resources. For instance, the financing agreement between the National Treasury and BNDES stipulates the costs of treasury loans tied to the TJLP, currently at 5%, and the costs of securities issued by the Treasury is approximated by the overnight SELIC rate (Figure 12).

Figure 12: SELIC Rate and TJLP (Long-term Interest Rate)



Source: BCB

Critics point to the negative carry of treasury loans represented by the difference between the SELIC rate and the long-term interest rate (TJLP). Most economists believe that in order to decrease the subsidy implicit in BNDES's loans, the TJLP should be close, if not equal, to the SELIC rate. One group argues that the government should raise (Garcia 2014) the TJLP towards the SELIC rate, while the other group suggests that the SELIC rate should fall towards the long-term rate (Romero 2014). However, the proposal to increase the TJLP would decrease the demand price of an investment project, that is, it decreases the present value of the discounted expected future cash flows of an investment project, so fewer investment projects will

be more profitable relative to money. As it is well known, Keynes proposed policies that would increase expected future cash flows and reduce the interest rate, thus increasing the demand price relative to the supply price of capital assets. As Keynes noted, "those assets of which the normal supply-price is less than the demand-price, will be newly produced; and these will be those assets of which the marginal efficiency would be greater than the rate of interest" (Keynes, 1936, p.228). That is, an increase in the TJLP lowers the demand price relative to the supply price of capital assets, deterring investment, as investors would require higher return rates on new investment projects.

Moreover, not only do investors have to formulate expectations about future cash flows (or future "q"s), but they have to form expectations about future interest rates which are included in the calculation of the project's net present value. This is a system in which expectations of future conditions determine present decisions. As Keynes put it, "it is by reason of the existence of durable capital equipment that the economic future is linked to the present" (Keynes 1936, p.146). Changes in the market interest rate level bring about change in the NPV of an investment project. Interest rate volatility affects the real economy through changes in the discount factor of investment decisions. Thus, a high and volatile interest rate increases uncertainty associated with productive investments. From this perspective, funding from BNDES at a relatively stable long-term interest rate (TJLP) reduces the uncertainty involved in predicting changes in the future path of interest rates, considering the riskiness of each individual project.

Long-term Funding Options Involving Domestic Capital Markets

There has been much discussion about the development of longerterm private finance. Though much of the discussion agrees that a basic requirement to foster long-term funding is low interest rates, it overlooks the fact this alternative requires low and stable market interest rates. As noted earlier, banks can operationally finance longterm assets by issuing government-insured deposit liabilities and profit from a steep and normal-shaped yield curve. However, the financing of long-term assets by them would impose significant asset liability mismatches on banks' balance sheets. The important question is related to the costs of carrying a mismatch between the duration of assets and liabilities on bank balance sheets, as long as interest and funding risks are carried on their books.

A number of policy initiatives designed to encourage local private banks and capital markets to provide funding to support long-term investment have been implemented and tailored to meet investors' needs, such as private sector long-term bonds, credit rights investment funds, infrastructure bonds, and infrastructure bonds investment funds. One of the main challenges is the creation of longmaturity instruments to be sold to investors with long-time horizons. Recent efforts by policymakers directed at lengthening the duration of bank liabilities included the development of financial bills (letras financeiras), thus imposing maturity matching on banks' books. Though it is believed that this policy initiative raises funding to finance long-term assets, it is rather an asset liability management (ALM) strategy to reduce the IRR on banks' balance sheets, by increasing the duration of liabilities, thus reducing the mismatch between assets and liabilities.

A basic requirement for the development of long-term financing by the private sector is low and stable interest rates to induce investors to hold long-term financial assets. Though modern central banks implement policy by operating with a short-term interest rate target to influence the longer end of the yield curve, Keynes would have supported a policy to influence the entire yield curve. The central bank would announce targets for the whole yield curve, and it would buy and sell securities at prices compatible with the targeted yields. [93]

First, by reducing interest rate volatility, the monetary authority can effectively induce financial institutions to "move out the yield curve" by targeting long-term interest rates and reducing future rate uncertainty. A basic requirement for banks' exposure to long-term fixed assets is an upward sloping yield curve, and a stable interest rate environment to mitigate interest rate risk. In the presence of a stable and low yield curve, banks could ride the yield curve and raise returns. A steep treasury yield curve and the promise that short-term interest rates would remain low for an extended period would provide the basis for financial institutions to profit from a steeper yield curve. A reduction in expected rate volatility minimizes the expectation of capital losses on long-term bond positions, encouraging financial institutions to profitably ride the yield curve (Rezende 2015). As a result, if those conditions are fulfilled, we can foresee banks lengthening the maturity of their assets. To this end, the Brazilian central bank can determine the term structure of risk-free interest rates by setting both, the longterm rate and the short-term rate. Keynes (1936) correctly criticized central banks' decision to operate only in short-term debt markets: "The monetary authority often tends in practice to concentrate upon short-term debts, and to leave the price of long-term debts to be influenced by belated and imperfect reactions from the price of shortterm debts; — though here again there is no reason why they need to do so." (Keynes 1936:206)

He goes on to say that "open-market operations have been limited to the purchase of very short-dated securities, the effect may be, of course, mainly confined to the very short-term rate of interest and have but little reaction on the much more important long-term rates of interest." (Keynes 1936:197). He then concluded that: "If the monetary authority was prepared to deal both ways on specified terms in debts of all maturities, and even more, so if it were prepared to deal in debts of varying degrees of risk... The complex of rates of interest would simply be an expression of the terms on which the banking system is prepared to acquire or part with debts... Perhaps a complex offer by the central bank, to buy and sell at stated prices gilt-edged bonds of all maturities, in place of the single bank rate for short-term bills, is the most important practical improvement which can be made in the technique of monetary management" (Keynes, 1936: 205, emphasis added).

In order to set interest rates of longer term debt, the central bank should offer interest-bearing term deposits for different maturities to support longer term rates. In fact, the Treasury-Fed accord created a system of pegged rates, generating an upward sloping yield curve. Financial institutions sold short-term instruments, such as three-month Treasury Bills, to buy long-term instruments. This policy was so successful that it was necessary to "limit bank purchases of long-term debt" (Meltzer 2003, 591). This policy created an increase in the demand for long-term securities and "by 1945 the Federal Reserve had acquired almost all of the outstanding bills" (Meltzer 2003, 596).

If the current administration wants to encourage funding of long-term assets from private banks, then it could allow them to borrow at the discount window at low rates such as the TJLP, to fund long-term assets. This initiative would encourage competition in the marketplace, so that banks expand their lending into longer maturities. Initially, the credit line could be up to one-third of banks' equity.[94] This proposal deals with potential liquidity problems due to the maturity mismatch. However, there still exists interest rate risk on banks' balance sheets. As Minsky put it, "Rediscounting was not a lender-of-last-resort activity reserved for a crisis, it was the mechanism through which part of the normal reserve base of banks was brought into being...The use of the discount window as a normal source of financing by member banks legitimated the regulation, supervision, and examination of member banks by the Federal Reserve." (Minsky, 1994: 11-12)

If the central bank starts discounting bank assets that are related to the financing of business, it "both creates a market for this paper by its purchases, and assures that it will have a protected status in financial markets. Such a paper will therefore be in a preferred risk class." (Minsky 1986: 362) This framework is biased towards hedge financing, and it restores banks' competitiveness in the lending market. Alternatively, banks could sell their long-term portfolio to BNDES, so private banks would avoid the IRR due to the funding of long-term assets with short-term liabilities. BNDES would buy these long-term assets using reserves balances. In this regard, private banks would focus on their specialization in underwriting. On the originators' balance sheet, we would have maturity matching, that is, reserves as assets and short-term liabilities, and BNDES would hold long-term assets on its portfolio.

In addition to low and stable interest rates to foster private sector investment in long-term assets, the policy alternatives to augment investment involve the private and the public sectors, that is, the federal government could undertake investment projects itself through fiscal policy, or allow BNDES to fund long-term investment activities, so the private sector can undertake such projects. Though public investment has increased, it has remained low compared to Brazil's investment needs (Rezende 2014).

In Keynes's framework, the condition required to get expansion of output is to produce a situation of normal backwardation[95]. This will

reduce the available/current supplies, so that individuals can expand production of output in order to sell forward, leading to an increase in employment. The idea of normal backwardation can be seen as the motor force for expansion in the economy. The expansion of output requires changes in the spot price relative to the forward price, that is, backwardation will lead to profit incentives that will encourage individuals to invest, leading to an expansion of output through the multiplier process. In this regard, though public banks play an important role in promoting real capital development and dampening market instability, their actions must be coordinated with macro policies to keep the economy in a quasi-boom state and prevent depressions.

Keynes's economic policy views went beyond public spending as a counter-cyclical policy tool. Public sector policy, by using the fiscal powers of the federal government, should be designed to fully mobilize unexploited domestic resources. In Keynes's framework, to smooth the cyclical movements of employment and output, we should set the market interest rate as low as possible, so that carrying costs of holding commodities are low, and reduce excess stocks by buying existing commodities, or existing capital stock. At the same time, it is necessary to shorten the time interval in which investors run off excess capacity. That is, the government has to step in as a buyer, reducing excess stocks and excess productive capacity. As government purchases increase, capacity utilization also increases, and it will reach a state in which investors will engage into replacement of investment and output expansion.

III. Final Remarks

One of Keynes fundamental policy proposals was his call for "socialization of investment". Brazil is a sovereign government. As the monopoly issuer of a non-convertible currency, it is not subject to the same constraints that business, local states, and households face. It can always spend by crediting bank accounts. The federal government can never become insolvent on debt denominated in its own currency (Rezende 2009). It can use its fiscal powers to mobilize resources generating domestic demand to achieve full employment. Minsky's proposals for the financial system went beyond Keynes' call for socialization of investment. His proposals called for institutions to constrain the inheritance instability of capitalist economies. In his framework, the main institutions put in place to stabilize the economy are the Big Bank and the Big Government. Minsky's instability theory provided the basis for dynamic regulation and a system of intervention to stabilize and unstable economy. His approach combined reorienting finance to promote capital development of the economy, in conjunction with the "Big Bank" in constraining instability. A well-functioning financial system must provide long term funding, promote the real capital development of the economy, and be designed to generate greater financial stability. However, if the government policies are successful in reducing system instability, then this government intervention will lead to model revision, in which agents will behave in a riskier way. As he emphasized, stability itself is destabilizing.

Domestic policies must continuously pay attention to changing institutions to constrain the instability that we are created by stabilization policies. It should be accompanied by other objectives. Brazil's National Development Bank, in cooperation with other innovation-related institutions, can play a bigger role to support technological development and innovation policies and strategies, in which the State plays an active role. That is, a development strategy should be designed, not only in terms of stabilizing income and employment levels, but also by singling out the specific sectors for intervention, and how to intervene in conjunction with the private sector. One of the essential functions of the financial system is to provide long-term funding needed for long-lived and expensive capital assets. However, one of the main challenges posed by the current private financial system is its failure to provide long-term financing. The short termism in Brazil's financial market is a major obstacle to financing long-term assets. In spite of a rapid credit expansion for both staterun and private banks, bank lending, in particular among private banks, is still concentrated around short maturities. The recent credit expansion notwithstanding, loans with maturity greater than 5 years represent a small share relative to total loans outstanding among private bank institutions. For Brazil's large private bank, Itau-Unibanco, long-term loans represent 1,59% of its total loan portfolio. This is in sharp contrast with long-term loans holdings for public banks. For instance, at Federal Savings Bank (Caixa Econômica Federal), it represents 15%, and for Bank of Brazil long-term credit represents 15% of its total loan portfolio, while for the National Development Bank (BNDES) it represents 57%. The absence of private bank loans with longer maturities to finance long-term investment is one of the key characteristics of the Brazilian financial system. Even though private banks have the ability to create longterm loans through the issuance of deposits, they have not been exposed to that segment (Rezende 2014).

The private financial system has not moved in a direction of promoting the real capital development of the economy, despite the implementation of a set of reform measures, including strengthening the legal and regulatory framework, to foster long-term finance.

For instance, Torres Filho and Macahyba (2015) highlight recent developments in the corporate bond market. Their work suggests that even though Brazil's corporate bond market and issuance of corporate bonds have risen significantly over the past decade, the buy side is mainly comprised of banking institutions. The existing regulatory framework created an incentive for banks to circumvent reserve requirements using their affiliated leasing companies. Moreover, their work also suggests that institutional investors have little incentive to allocate their portfolios towards riskier corporate debt, as they can create a better risk-return profile holding high-yield short term government debt. In this regard, BNDES represents the financing supply side of this development strategy. Brazil's national development bank, and the other public banks, conforms to Minsky's call for the government needs notwithstanding, require a bigger – not smaller – role played by BNDES, and other public financial institutions, although one with a different set of organizational capabilities to foster public-private partnerships, and develop a capital market complementary to BNDES.

Contrary to the mainstream view, finance is not a scarce resource. Banks can finance assets by issuing liabilities. Banks are not constrained in terms of ability to originate loans, that is, they can create as much finance as they want to. They are constrained in terms of "willingness to accept". The important question is related to the costs of carrying a mismatch between the duration of assets and liabilities on banks' balance sheets, as long as interest and funding risks are carried on their books. The involvement of the private financial sector in long-term financing of development requires lower and stable interest rates. Not only financial institutions have little incentive to be exposed to longer maturities of government debt, but they have shown no preference to be exposed to corporate credit risk. It is, thus, a high and volatile interest rate environment, due to active manipulations of the central bank's policy rate, known as Selic rate, and the effects of mark-to-market volatility, have shifted portfolio preferences of long-term private domestic fixed income investors towards low duration, short-term assets. That is, high and volatile interest rates are one of the main obstacles to the development of long-term financing. This calls for a major reform of Central Bank of Brazil's existing institutional framework, to ensure transparency and accountability to citizens.

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Chapter 5 Notes

[88] See for instance Freitas (2011) and Prates and Freitas (2013).

[89] For more details about Brazil's response to the crisis see Barbosa (2010).

[90] Financiadora de Estudos e Projetos (FINEP), the Brazilian Agency for Innovation. FNDCT: National Fund for Scientific and Technological Development; BNDES -FUNTEC: university-industry cooperation fund.

[91] As of September 2014, the five largest Brazilian banks by asset volume were: Banco do Brasil (BB- State-owned), Itau, Caixa Economica Federal (CEF- State-owned), Bradesco, and BNDES. The five had total assets close to US \$2 trillion, equivalent to 71% of total banking assets.

[92] The average interest rate applied to loans is substantially higher for traditional banks compared to BNDES. They are also characterized by high net interest margins and returns on assets.

[93] Though the transmission mechanism of monetary policy by changing the overnight lending rate is supposed to have an impact on the level of economic activity by changing bank lending, this

effect is uncertain and indirect. The operation of public banks by influencing bank lending has a direct and more effective impact on monetary policy's objective.

[94] This rule is arbitrary and ultimately depends on the country's long-term investment needs, the availability of real resources, and the state of the economy.

[95] See Kregel (2010) for a detailed exposition of Keynes's contributions to the theory of finance.

6. The International Lender of Last Resort for Emerging Countries: A Bilateral Currency Swap ?

Camilla Villard Duran

1) Introduction: the changing politics and institutional design of international monetary cooperation*

Bagehot's (1873) classic definition identifies a lender of last resort as an actor willing to provide credit to illiquid, but not insolvent institutions, when no other actor will, at a penalty rate – usually, in times of crisis.[96] At the international level, the main concern is to assure a lender that is capable and willing to give access to hard currencies in liquidity crises, i.e a monetary stabiliser (Kindleberger and Aliber, 2011 [1978]: 229-256; McDowell, 2012; Broz, 2013; Lastra, 2015: 540-541). The primary responsibility of an international lender of last resort is to provide liquidity to cope with balance of payment imbalances, allowing smooth adjustments on currency values and, at the same time, precluding those changes not consistent with the country economic fundamentals (Kindleberger and Aliber, 2011 [1978]: 230). In the 1940s, the Bretton Woods Agreements assigned this mission to the International Monetary Fund (IMF), as a formal multilateral institution responsible for providing balance of payment assistance for countries in need.

Given that lenders of last resort play such a critical function, why did the largest EMEs in Latin America and Asia not rely on formal, institutionalised lenders of last resort to cope with the 2008 crisis? Why did they instead prefer to use ad hoc arrangements?

Interestingly, the management of the 2008 crisis revived international central bank cooperation. The US Federal Reserve (Fed) – the central bank issuer of the most important international currency – was seen to be the international lender of last resort (ILOLR) for the world (Aizenman and Pasricha; 2010; Allen and Moessner, 2010; Moessner and Allen, 2010; McDowell, 2012; Chey, 2012; Broz, 2013). The Fed rescued transnational financial institutions with branches in the US – both banking and non-banking institutions (Baxter and Gross, 2010) – and created swap lines destined to foreign central banks to channel US dollars to financial markets suffering from liquidity shortages.

But what were (and are currently) the ILOLRs for the largest EME countries? What is the nature of monetary cooperation at multilateral, regional and bilateral levels? Under what conditions do the largest EMEs use formal or ad hoc institutions as ILOLRs?

As pointed out by Woods (2010), the first hope in the aftermath of the crisis was that the International Monetary Fund (IMF) could provide a multilateral alternative to the unilateral accumulation of foreign reserves. This would go "to the heart of emerging economies' confidence in the institution" (Woods, 2010: 56). However, the IMF governance reforms attempted by the Group of 20 (G20) have largely failed (Helleiner, 2014), and the Fund's new lending facilities (without or with limited conditionality) were not drawn on by the biggest EME countries in the aftermath of 2008 crisis (IMF, 2014). At the bilateral level, the Fed chose only four EMEs for its temporary bilateral swaps agreements (Brazil, Mexico, South Korea and Singapore). Today, the Fed has standing swap facilities only with developed country central banks.

This article aims to overcome a gap in the current research on monetary cooperation after 2008 crisis. Especially on bilateral swaps, most studies are focused on developed countries' perspectives and choices, rather than on EME points of view (Aizenman and Pasricha; 2010; Allen and Moessner, 2010; Moessner and Allen, 2010; McDowell, 2012; Broz, 2013; Henning, 2015).[97] Also, these studies do not address the relationship between the different ILOLRs for these countries, i.e. their "liquidity providers" in times of crisis.

The main objective of this article is to reconstruct the management of the 2008 crisis and its aftermath from the perspective of the EMEs, and to identify how the institutional nature of monetary cooperation changed in relation to the 1990s.

Based on the empirical findings, a key contribution of this article is to identify under which conditions the largest EMEs in Latin America and Asia could be expected to establish institutionalized cooperation in the future. In addition, this research tries to identify how the EME decision-making process is impacting the architecture of the International Monetary System (IMS), given their evolving responses to liquidity crises.

There are four main conclusions about the politics of international monetary cooperation and institutional its design. First. the accumulation of foreign reserves (as a model of unilateral action), boosted by the fear of dependence, is leading to greater monetary independence for the largest EMEs at the international level. From a purely economic perspective, the acquisition of assets in hard currencies as a precautionary policy leads to an outflow of resources developing to developed countries. Yet politically, from the accumulation of reserves gives EMEs alternatives in moments of crisis, increasing their monetary independence. This outcome confounds the expectations of the dependency theory, as I will explain later.[98]

Secondly, in explaining EME monetary choices in 2008, issues of power and distributional gains seem to have greater explanatory power than the reduction in transaction costs offered by formal cooperation through international organisations.

Thirdly, the combination of political stigma and increasingly autonomous central banks accounts for the variation in EME monetary responses to the 2008 crisis and its aftermath. EME international monetary decisions have been managed or directly influenced by national central banks aspiring to the same model of cooperation already implemented by central banks in developed economies.

Fourthly, the IMS is becoming not only more fragmented, but also more diverse. Swap agreements have been formalized in hard currencies (i.e. the US dollar), as well as other currencies such as the Chinese Renminbi and the Korean won. This evidence suggests a change in global liquidity denomination and points to the slow, but sure emergence of a multi-currency world.

This article is structured as follows. In section 2, I introduce the puzzle posed by EME responses to liquidity crises and their ILOLR choices. Next, I set up an analytical framework to analyse this puzzle and suggest hypotheses to explain monetary cooperation outcomes in the 2008 crisis, considering the role played by demand-side factors. I then present the empirical results of my case studies, a sample of Latin American and Asian countries. Finally, the conclusion presents closing thoughts on theoretical and policy implications of this study.

2) The puzzle: Is the international lender of last resort for emerging countries not an international organisation?

This study addresses the following puzzle: why did the largest EMEs in Latin America and Asia not use formal institutions, at multilateral and regional levels, to deal with liquidity shortages during the 2008 crisis? Despite the predictability that formal institutions usually assure (or ought to assure), these EMEs preferred to resort to bilateral arrangements on an ad hoc basis. This preference has not always been the case, however. During the 1990s, the biggest EMEs relied on the IMF and other multilateral and regional arrangements to respond to liquidity shortages, and cope with their currency crises. The multilateral and regional arrangements were also combined with bilateral agreements (mainly, bilateral loans) with their main economic partners.

That was not the case for the management of the 2008 crisis and its aftermath. First of all, these EMEs relied on unilateral action. From 2000, they exponentially expanded their reserve accumulation of hard currencies, and continued to reinforce this policy even after the economic upheaval. Foreign reserves are associated with lower risks of a currency crisis, although this is a very costly policy and its marginal benefits tend to decline at high levels (IMF, 2013).[99] Secondly, when faced with the choice of monetary cooperation, EMEs preferred to resort to ad hoc bilateral arrangements, as their first and most important line of defence.

The institutionalist literature on cooperation emphasizes the role of international organisations in promoting public goods, even in the absence of a hegemonic actor. For instance, Keohane described the benefits of cooperation as follows: "International regimes – clusters of principles, norms, rules, and decision-making procedures – reduce transaction costs for states, alleviate problems of asymmetric information, and limit the degree of uncertainty that members of the regime face in evaluating each other's' policies" (Keohane, 2005 [1984]: xi). The management of currency crises during the 1990s is an example on how monetary cooperation was possible, even with a hesitant American hegemon. For the first time in the Fund's history, it played an important role as ILOLR for EMEs suffering from capital account, rather than current account, crises (Lastra, 2015: 540).

From an economic perspective, multilateral monetary cooperation has recognized advantages: (i) risk pooling because of its universal membership; (ii) a countercyclical role, supplementing private markets in times of stress; (iii) good policy signalling with an international seal of approval that catalyses private financing; and (iv) low price because of the de facto preferred creditor status (IMF, 2010).

Nevertheless, to deal with 2008 liquidity crisis, the biggest EMEs preferred to resort to ad hoc bilateral agreements rather than to access formal multilateral or regional institutions. In addition, in the aftermath of the crisis, they decided to reinforce or create regional monetary arrangements, even if they were not heavily used in 2008. At the multilateral level, the biggest EMEs changed their course of action: they became creditors and not debtors of the IMF. For instance, several EMEs participated in the New Arrangements to Borrow (NAB) as lenders to the Fund. However, this choice had a specific design: EMEs invested their reserves in temporary agreements with the Fund, but kept ownership at their national central banks, i.e. there was no firm commitment with the IMF in the form of quotas.

There are three main important features of 2008 crisis management in comparison with the 1990s' institutional scenario: (i) for the management of the 2008 crisis, the ad hoc bilateral arrangements had a very different legal structure involving different national actors: rather than loans between governments and their treasuries, these were swap arrangements between national central banks; (ii) at the multilateral level, the IMF was an option systematically avoided, even after the introduction of new lending instruments without or with limited ex post conditionality – instead, the biggest EMEs became lenders (and not borrowers) of the Fund; and (iii) regional monetary arrangements already in place were not used by most of the biggest EMEs, even if created after the 1990s to supplement the availability of lending at the multilateral level.
Yet, in both, the aftermath of the 1990s and the 2008 crisis, the same pattern of institutionalisation of monetary cooperation could be observed: the creation or reinforcement of regional agreements based on bilateral swaps between central banks. In the aftermath of the 1990s' crisis, the choice of this institutional design (network of bilateral swaps) may be attributable to the lack of trust between neighbours. Countries could maintain their foreign reserves in the hands of national actors, i.e. their own monetary authorities. This argument is illustrated by the establishment in 2000 of the Chiang Mai Initiative (CMI),[100] an Asian regional monetary arrangement based on swaps, and the failure of the Japanese proposal on the creation of an Asian Monetary Fund that would have pooled resources.

In the aftermath of the 2008 crisis, there is another factor which tends to reinforce this institutional choice: the power of central banks and their preference for keeping their financial role in monetary transactions, instead of delegating this role to an international organisation at the regional or multilateral levels.

McDowell (2012) proposed the concept of "sovereign international lender of last resort" to describe the role of the Fed during the 2008 financial crisis. A sovereign ILOLR has both, the capacity to develop this role, i.e. issues the hard currency in demand, and the willingness to assume the financial task of "rescue". The Fed definitely met these criteria and assumed this role during the crisis. However, the Fed was not the ILOLR for all in this crisis. Instead, it selectively chose which central banks could benefit from its swap lines in US dollars.[101] McDowell's emphasis on capacity and willingness of the sovereign ILOLR cannot alone explain the outcomes on monetary cooperation in the 2008 crisis and aftermath.

In an interesting decision in November 1998, the Federal Open Market Committee (FOMC) of the Fed recognized that bilateral monetary cooperation was in disuse, claiming that this was because of the existence of a "well established present-day arrangements for international monetary cooperation". The FOMC decided to allow bilateral currency swaps between the Fed and foreign central banks to lapse after 15 years of abandonment.[102] Nevertheless, 2008 witnessed a revival of central bank cooperation to deal with crisis liquidity, not only at the centre of the IMS (those central banks that issue hard currencies), but also in the periphery.

3) Analytical framework: supply and demand sides of the international lender of last resort

This paper draws on Hegemonic Stability Theory (HST) literature (Kindleberger and Aliber, 2011 [1978]), and the idea of regime change and complex interdependence (Keohane and Nye, 2012 [1997]) in its analytical framework. To explain the 1971 cataclysmic shift in the IMS, namely the end of the dollar-gold era and the fixed exchange rate system, Keohane and Nye (2012 [1997]) argue that "the rules of the regime were inconsistent with the underlying power structure" (Keohane and Nye, 2012 [1997]: 135).

I believe that this analytical approach can also explain the change in monetary cooperation after 2008. US economic dominance and its influence in multilateral institutions determined the responses to crisis by the biggest EMEs in the 1990s. The 2000s then saw a change in the balance of these international relations, and by 2008 the legal structures were not reflective of this underlying change in economic power. New institutional supports for monetary cooperation thus emerged.

Furthermore, my main argument is that the particular design of these new arrangements reflected central banks' increasing global role. As pointed out by Keohane and Nye (2012 [1997]), "a regime may be altered by the emergence of new norms in other areas of world politics, which are then transferred to the particular issue area" (Keohane and Nye (2012 [1997]: 126). In the issue area of financial regulation, the ideas and norms of cooperation among central banks emerged and strengthened, and were then transferred to monetary arrangements in 2008. After the breakdown of the Bretton Woods system in 1971, central bank cooperation was fostered by the creation in 1973 of the Basel Committee on Banking Supervision at the Bank for International Settlements (BIS). This coincided with the economic process of growing internationalisation of financial and capital markets. From the end of the 1980s onwards central banks cultivated shared knowledge and values on financial regulation through capital requirement agreements ("Basel Capital Accords").

However, in relation to monetary issues, central banking was mainly concerned with internal monetary stability, as the primary or exclusive objective in this specific historical period. This prevailing idea determined institutional design during the 1990s and the 2000s for the majority of central banks (Laurens et al., 2009: 157, 242; Duran, 2012; Lastra, 2015: 55-64). The 2008 crisis changed this intellectual paradigm of primacy for internal monetary stability, and exposed the non-neutrality of money (Aglietta, 2011; Borio, 2011). Central bank cooperation on monetary issues was revived in the form of currency swaps.

Currency swaps between central banks are not a new phenomenon. During the era of 'Bretton Woods I', there were lines between central banks in developed countries and the BIS to maintain the stability of the fixed exchange rate regime (Moessner and Allen, 2010: 25-27; Kindleberger and Aliber, 2011 [1978]: 249-250; Toniolo, 2005: 381-388; Coombs, 1976: 69-91; Hirsch, 1967: 349-353). However, these were later discontinued as a practice, and central bank dialogue and cooperation instead concentrated on financial regulation and growing concerns related to cross-border banking activities.

What was new in the 2008 crisis and its aftermath was the rapid proliferation of currency swaps, their large volume (if used to their full extent, with the possibility of outstripping IMF resources), their extension to EME countries and their formalization in hegemonic and other currencies. Currency swaps account for the development of a USD 1 trillion network (excluding the unlimited size of swaps between central banks in developed economies), and 70 new arrangements between 2010 and 2014 involving more than 50 countries (McDowell, 2015; Henning, 2015). As a comparison, the IMF has only USD 645 billion in quotas in lendable resources, and a further USD 258 billion in additional pledged and committed resources. This network of bilateral swaps, including regional agreements based on this structure, can have more economic leverage than the Fund.

Moreover, currency swaps have a unique legal structure. At their heart, they reveal two important characteristics: central bank power, as I will develop in more detail in this study, and sovereignty. These contracts are precommitted resources. There is no ex ante "transfer" to an international organisation as quotas. Foreign exchange reserves, or liquidity in other currencies besides the US dollar, are kept in national hands until the activation of a swap.

The proliferation of swaps is a symptom of an important change in international monetary politics and institutional design of the ILOLRs. To explain this major change, it is important not only to examine the supply-side, but also demand-side factors that currently influence ILOLR functions.

International monetary cooperation: supply side factors

This ILOLR perspective features widely in the current literature about the management of the 2008 liquidity crises (Aizenman and Pasricha, 2010; Allen and Moessner, 2010; Moessner and Allen, 2010; Kindleberger and Aliber, 2011 [1978]; McDowell, 2012; Broz, 2013; Helleiner, 2014). Indeed, supply-side factors can explain why institutionalized solutions for monetary cooperation fell short in the crisis. In terms of capacity, both regional and multilateral institutions suffered from flaws in their design.

By comparison to the 1990s, the 2008 crisis was too large for regional institutional options for monetary cooperation, and the design of international options at the IMF failed to respond to the EMEs'

needs. Regional arrangements, e.g. Latin American Reserve Fund (FLAR)[103] and the first version of the CMI, were too small for the EMEs' needs. Attempts to reform and adjust the Fund's toolkit to better respond to crisis were too slow to be of use. The crisis hit in October 2008 and the G20 meetings were organized between November 2008 and 2009, to respond to this economic meltdown. The most important IMF board decisions (e.g., the creation of mechanisms without or with limited conditionality) were taken only in March 2009.[104]

At the time of the crisis, the IMF and the regional arrangements did not have well-developed precautionary instruments designed for crisis prevention that could produce the same economic effect as foreign reserves, and reduce the probability of contagion. The Special Drawings Rights (SDR), a global reserve asset managed by the Fund, did not have sufficient economic size to respond to the EMEs' needs, even after the unprecedented allocation agreed by the G20 during the London Summit in April 2009.[105]

Furthermore, the timing for access to foreign currencies at the multilateral and regional levels was not adequate to respond to the immediate demand. There is a lack of automaticity for the IMF programmes, as well as for existing regional arrangements, which require a de jure link with the Fund beyond a certain amount (e.g., the CMI). Despite the low economic cost (IMF, 2010a), the existing institutional arrangements were not adequate in terms of technical capacity.

To understand the patterns in the turn from institutionalized structures of monetary cooperation to ad hoc bilateral arrangements, one must also analyse the willingness of central banks to act as international lenders of last resort in the times of crisis. In the 1990s, central bank cooperation was not an option, not a part of the mainstream thinking on international monetary policy with national central banks more concerned with internal monetary stability. In 2008, a "new" global actor, capable of providing hard currency but unwilling to do so in the 1990s, appeared: the Fed. In the 1990s, only Mexico benefited from the Fed's currency swaps. Yet this swap was on a very small scale in comparison with other monetary arrangements[106] and the swap was comprised by a regional arrangement, the North American Free Trade Agreement (NAFTA). As such, it was more a product of government-political choices rather than a Fed initiative. In 2008, however, new countries besides Mexico benefited from this monetary option: Brazil, South Korea and Singapore. Japan and its central bank (the Bank of Japan) were also ILOLRs for countries in Asia with US dollar shortages, such as Indonesia and India (Aizenman and Jinjarak, 2010).

The emergence of new willing ILOLRs helps, to some extent, to nature of monetary cooperation: explain the changing from counterparties centralized international institutions as (1990s) towards currency swaps between national central banks (2008 and its aftermath). Yet the IMF and regional monetary arrangements were also available to the biggest EME countries. And the Fund did make reform efforts to address shortcomings in its technical capacity. So why, despite the Fund's willingness, was there no recourse to its lending facilities by the biggest EMEs in Latin America and Asia, even after reforms were implemented to address technical flaws? To answer this, one needs to consider the demand side of the equation.

International monetary cooperation: demand side factors

The biggest Latin American and Asian countries had bad experiences with IMF programs during the 1990s and the beginning of the 2000s. In these EMEs, the IMF was, and still is, domestically perceived as an US-led institution with neoliberal approaches and a "one size fits all" political model.[107]

The pervasive perception was that if the biggest EMEs turned to the IMF for help in 2008, the Fund would impose conditions not appropriate for them. Furthermore, these countries felt they did not have political power inside the institution - i.e., other countries would

set the conditions. Even the creation in 2009 of the Flexible Credit Line (FCL), and the renamed Precautionary and Liquidity Line (PLL), without or with only limited ex post conditionality, was not enough to avoid this political stigma. The demand for the FCL and the PLL was, and still remains modest (IMF, 2014).[108] This was also the case for the Short-term Liquidity Facility (SLF) introduced on October 29, 2008.

During the 2000s, driven also by political stigma, the biggest EMEs (e.g. Brazil, South Korea and Indonesia) relied on unilateral accumulation of assets in hard currencies to prevent crisis (i.e. with a precautionary objective), as well as for interventionist purposes related to mercantilist export concerns. The share of global reserves held by developing and emerging economies rose from 28% to 65% between 1990 and 2008 (Aizenman and Jinjarak, 2010). Global reserves rose from a total amount of USD 2tn to USD 6,3tn between 2001 and 2014.[109] As Stiglitz argues, since "reserves are mostly held in hard currencies, they also represent a transfer of resources to the United States and other industrialized countries" (Stiglitz 2009: 110). This global monetary system can be characterized by its "inequity-instability link" (Ocampo, 2010).

Dependency theory (Prebisch, 1981 [1949]; Cardoso and Falletto, 1979) would suggest that this flow of resources contributes with the enrichment of wealthy countries at the expense of the periphery and semi-periphery.[110] However, even though the acquisition of foreign reserves represents an economic transfer of resources from developing towards developed countries, once the 2008 crisis hit these EME countries had more independence to choose their monetary actions at the international level. Interestingly, this policy of action" "dependent monetary seems to produce greater independence for EME countries, an outcome not predicted by the dependency narrative.

Between 2008 and 2011, 25 Stand-by Arrangements (SBA) were formalized with the IMF with liquidity or precautionary purposes (IEO, 2014). However, SBAs were only signed by EMEs from Europe, very

small countries in Latin America (Costa Rica, El Salvador, Honduras, Guatemala, Dominican Republic, Jamaica and Stt Kitts and Nevis), and other countries in Asia and Africa without systemically important financial centres (such as Angola, Mongolia, Sri Lanka, Pakistan). The IMF is the ILOLR for developing countries, but not for the biggest EMEs in Latin America and Asia. These EME countries are using their foreign reserves for political leverage in the IMS.

In the IMF's own analysis of this phenomenon, it draws largely on explanations of political stigma. According to the Fund, "public opinion contributes with a perceived 'political cost', associated with requesting financial assistance from the Fund" (IMF, 2014: 9). Yet, during the 2008 crisis, the IMF appeared to change its tone and, in some cases, its policy. The Fund even advocated in favour of capital controls (IMF, 2010b) and invested in new instruments without ex post conditionality. This would suggest that some of the EME concerns about IMF programs had been alleviated.

Nevertheless, the political stigma remained, seemingly more attached to the Fund as an organization rather than to particular financing instruments (IMF, 2014: 42). Historical experience of interactions with the IMF created negative perceptions about the organization as a whole. The fact that countries chose not to draw on the Fund's advice in addition to avoiding its financial instruments reveals the reputation that surrounds the whole organization. This stigma is also associated with the perceived illegitimacy of the Fund's policy solutions. The survey results below (Figure 1) reveal the lack of confidence in the Fund's advice, especially by the largest emerging countries.[111]

Figure 1: How Much Did the Perception That the IMF Had a "One-Size-Fits-All" Approach Matter in the Decision Not to Seek Advice (Percent of surveyed country authorities)



Source: IEO.

In addition, as pointed out by the Fund's Independent Evaluation Office (IEO, 2013), the stigma has a regional dimension: it remains particularly strong in member countries in Latin America and Asia, and is related to the experience of the 1990s' crisis. Although there are signs of stigma declining in the official sector, "negative perceptions appear to linger strongly among the general public, media, and NGOs" (IMF, 2014: 42).

While political stigma can explain the decision to seek alternatives to the Fund, it does not explain the institutional design of the immediate responses to the 2008 crisis by emerging countries, nor the institutionalization of monetary relations in its aftermath. There is still another factor that can contribute to understanding the changing nature of monetary cooperation post-2008 crisis: the role of powerful central banks.

Central banks' power and their international aspirations tended to influence EMEs' preferences for bilateral arrangements at the global level. The influence of central banks also explains the different design of bilateral arrangements in the 1990s and the 2008 crisis: from bilateral loans between governments (treasuries) to bilateral currency swaps between monetary authorities.

As bureaucracies, central banks operate in the same policy space as Ministries of Finance, with each overseeing particular core responsibilities. Central banks engage in bureaucratic competition to occupy this shared policy space by ensuring that new policies that match their preferences fall within their "territory". The concept of territory, as developed by Downs (1967: 212-213), helps explain the dynamics of competition between these agencies: each of them tries to maximize its degree of dominance over social action in each portion or 'territory' of the policy space.

The central bank's 'territory' is that policy portion where it substantially controls the expertise and resources required for policy implementation, i.e. the management of foreign reserves and the creation of money. In the monetary domain, Finance Ministers and central bankers are "allocational rivals" (Downs, 1967), in the sense that they share common goals, but compete over the control of the implementation process. The growing complexity of monetary policy and the well established network of central bankers made central banks the winners in the dispute for policy options in the period after the 2008 crisis. The "Great Moderation" and the accumulation of foreign reserves empowered central banks and their agents in EMEs and advanced economies. The interests and preferences of these central banks are therefore central to understanding the outcomes of monetary cooperation at the international level.

But how do central banks shape political outcomes on international monetary cooperation? It is important to assess the impact of central banks at two junctures:

(i) Once a crisis hits, the central bankers are in the driver's seat. They are responsible for the political choices and the banks tend to prefer currency swaps, since they can keep their financial role and have control over foreign reserves, which they manage; (ii) In a post-crisis scenario, the authority returns to Ministers of Finance. They are responsible for political choices, but rely on central bank expertise. Powerful central banks reshape the political choices to keep their financial role and retain control over the management of foreign reserves. This tends to reinforce a new design for regional arrangements: from international organizations as the central counterparty towards formalized network of currency swaps among monetary authorities. In this sense, central banks could be considered an epistemic community, sharing values and patterns for action (Haas, 1992; Marcussen, 2009), as well as an "establishing expert" ("expert instituant", Castel, 1985) that reshape the political choices and redefine them at the same time.

In both phases, central banks compete for policy to fall into their territories and shape its institutional design. For this study, I suggest that the degree of EME central bank power is a product of both, its political power (certain de jure or de facto autonomy in relation to central government), and its economic power (the foreign reserves' size managed by them).

Supply and demand factors reshaping international monetary system

In 2008, ad hoc bilateral arrangements formalised by the biggest EME central banks were their first line of defence. The currency swaps between the Fed and EME central banks in Mexico, Brazil, Singapore and South Korea, are examples. The Bank of Japan was also a lender for Indonesia, South Korea and India. Regional alternatives and multilateral institutions were the second-best option, at most. It seems that the biggest EME central banks kept their financial role as intermediaries of resources, and left the IMF as the primary financial actor only for smaller developing countries (or EMEs in Europe). These same EMEs engaged with the IMF only as lenders for their new facilities, i.e. the New Arrangement to Borrow, rather than as borrowers.

The monetary responses to crisis and precautionary measures are under the control of central banks, while the IMF is perceived – especially by the biggest EMEs – as a space for Finance Ministers. The biggest EMEs, such as India, Brazil, South Korea, Mexico and Russia, are represented at the Fund by their Finance Ministers. The central bank governors are only the alternate representatives.[112]

The possibility of the Fund playing a coordinating role also for central banks was raised in 2010, but failed to make headway (IMF, 2010a: 15-20). That year, the Fund's board of directors refused the staff proposal for a Global Stability Mechanism (GSM).[113] The GSM proposal was quite similar to the role of the Bank for International Settlements (BIS), in terms of coordination, with respect to the first generation of currency swaps in the 1960s (Kindleberger and Aliber, 2011 [1978]: 249-250; Coombs, 1976: 83, 232). When South Korea endorsed this proposal during the 2010 G20 meeting, two months after the Fund's deliberations, it was already a contested proposition. The debate over the creation of the GSM disappeared from the IMF papers after the end of 2010.

Central banks' global role is changing the institutional nature of monetary cooperation, both at the periphery and the centre of the IMS. In 2013, the Fed, the Bank of Canada, the Bank of England, the Bank of Japan, the European Central Bank and the Swiss National Bank jointly announced the creation of a standing network of bilateral currency swaps.[114] At the centre of the monetary system, the IMF has been sidelined in monetary cooperation. The swaps in this standing network are unlimited, revealing the extent and potential impact of this agreement, even if it is a more "flexible" model of cooperation.

The periphery is aspiring to this flexible institutional model of monetary cooperation. For one, this form of monetary cooperation is attractive in that it sends signals to private markets about the financial robustness of their economy since these instruments usually do not impose formal conditions. Further, the EME perception is that bilateral swaps have similar effect as precautionary instruments, such as foreign reserves (IMF, 2013: 9), the preferred model of EME monetary action in the 2000s. Previously existing institutions lacked these precautionary effects: the IMF established its own precautionary mechanisms in March 2009, and the CMIM introduced such mechanisms only in 2012. For the BRICS CRA, it was introduced in 2014, while the FLAR still does not have a precautionary facility.

Eric Helleiner's (2014) argument is that the preference for currency swaps is due to their automaticity. A bilateral swap is more readily accessible than the IMF or regional facilities. At this point, Helleiner refers to the swaps already formalized by the Fed. However, I would argue that a swap line specifically destined to the EM countries is not automatic at all. Those EMEs interested in a swap with the Fed asked for help repeatedly (the Fed declined requests from Indonesia, Turkey and India, and was slow to grant South Korea's request).[115] At present, only developed banks enjoy the economic effects of automaticity (and unlimited size) in these agreements with the Fed. Maybe it is not appropriate to compare the CMIM and the CRA agreements with the Fed's swaps. The multilateral treaty of both regional arrangements ensures the right to have access to currency swaps under certain and specific conditions, after the authorization of a standing committee. Thus, the most appropriate comparison in terms of automaticity would be between the swap lines already formalized with the Fed and the possible swap agreements of the CMIM or the CRA once authorized by a positive decision of the respective regional committee.[116]

As a matter of fact, an international currency, such as the US dollar, demands an ILOLR that can sustain its status during times of crisis. The Fed exercised this role of ILOLR on the basis of political and economic hierarchies among EMEs. For instance, for Brazil, Mexico and South Korea, the Fed was their main ILOLR. The IMF was only a second source for Mexico. For Ecuador and Indonesia, regional partners and organisations were available as ILOLRs in US dollars. None of these countries, however, was chosen by the Fed to

establish a standing bilateral swap in US dollars – this arrangement was only secured by the elite of the central banks in developed world (dubbed the "C6" by Perry Mehrling in Bernes et al., 2015). This tends to reinforce the evolving process of a multi-layered monetary system.

The Fed's agreements reveal that it is not willing to serve as the ILOLR for all EMEs, although it would be capable. The IMF, although capable and willing, is not demanded by these biggest EME due to demand-side factors. Both reinforce the choice of EMEs in changing their monetary strategy: from US-led institutions (the Fed or the IMF) to regional and bilateral alternatives outside the US influence, constructed based on accumulation of reserves (in hard currencies) or new emergent currencies.

This tends to sustain the status of the US dollar as a negotiated currency until these EMEs can find an alternative (Strange, 1971; Helleiner, 2008; Otero-Iglesias and Steinberg, 2013). The growing number of bilateral swaps in other currencies besides the US dollar could reveal a strategy to find such an alternative. The People's Bank of China (PBoC) has almost 30 swaps in Renminbi with different central banks. Central banks from South Korea, Indonesia and Malaysia also have swaps in their currencies. These bilateral swaps create global liquidity in a variety of currencies and contribute significantly to the emergence of a multi-currency world.[117]

Explaining variation in ILOLRs for EMEs

The shifts on the demand-and supply-side help explain the broad trend in EMEs ILOLR choices in the aftermath of the crisis. However, there is important variation among EMEs in their choices. I argue that this variation is determined by a complex interaction between the supply side (the existence of capable and willing ILOLRs) and most importantly, the demand side (the preferences of the EMEs determined by past experience and the strength of their national central banks). As an original contribution of this study, I focus on the demand side.

Hypothesis 1.1. Past experience (political stigma).

Political stigma associated with institutionalized monetary arrangements, the product of bad past experiences with IMF programs in the 1990s and early 2000s, explains EMEs' preferences for ad hoc bilateral swap arrangements. I build on the IEO and Fund's surveys of EME perceptions on political stigma (IEO, 2013; IMF, 2014) and official declarations divulgated by the media on the 2008 crisis' responses by the EM countries. This hypothesis predicts that those EMEs with particularly high stigma towards the Fund to be more likely to pursue bilateral swaps over multilateral arrangements.

This hypothesis applies differently for regional arrangements. Since regional arrangements usually do not impose conditions, or they rely on shared "understandings" among their members, the EMEs have voice. For instance, the FLAR and the CMI each have unconditional portions not linked to Fund's programs.[118]. Since the perceived conditionality is lower, hypothesis 1.1. does not explain the reaction to regional arrangements, but only to the monetary response related to the IMF.

Hypothesis 1.2. Relevant national actors: central banks.

EMEs' decision to pursue ad hoc bilateral swap arrangements over institutionalised mechanisms is due to the increasing autonomy and importance of central banks, which found cooperation among monetary authorities to be a preferable response to crisis. I measure central bank power in both political terms (the degree of political autonomy in relation to central governments), and economic terms (the size of foreign exchange reserves managed by this agency). The two hypothesis related to the demand side (H.1.1. and H.1.2.) interact with one another, according to the table below. Variation among the largest EMEs can be understood on the basis of the political stigma towards the IMF (low or high) and the central bank's degree of power to define (or reshape) political choices at the moment of crisis and in the post-crisis period.

Table 1. EME preferences for monetary cooperation and the outcomes in institutional design for the ILOLRs (H.1.1 and H.1.2)

Relevant	Immediate res	sponses to crisis	Aftermath of a crisis:	
national actor	Low political stigma towards the IMF	High political stigma towards the IMF	process of ILOLR institutionalisation	
Powerful central banks	Bilateral currency swaps	Bilateral currency swaps	Bilateral swaps and/or regional arrangements based on bilateral swaps	
Less powerful central banks	Multilateral responses	Regional arrangements based on int'l organisation (IO)	Regional arrangements based on international organization (IO)	

4) Case studies: the EME empirical evidence

To test the hypotheses above, I selected a sample of the biggest EMEs in Latin America and Asia, according to the following criteria: (i) they are classified as "emerging and developing" countries by the IMF, based on their level of development;[119] (ii) in the 1990s, they suffered from a capital account crisis and they resorted to some form of monetary cooperation; (iii) in 2008, they choose some form of monetary cooperation to avoid or to deal with balance of payment imbalances (and did not only rely on unilateral action).

The 1990s' currency crises in Latin America and Asia were: Mexico (1994), Indonesia (1997), South Korea (1997), Philippines (1997), Thailand (1997), Brazil (1998), Ecuador (1998), Argentina (2001) and

Uruguay (2001).[120] I excluded Thailand, because in 2008 the country passed through very serious domestic political problems that could distort responses to the 2008 crisis.

The Philippines, Argentina and Uruguay did not combine monetary responses to crisis, but rather relied on loans destined to specific development projects. Colombia was chosen as a control case. It did not have a past experience with the IMF during the 1990s, and accessed IMF funds in 2010 for the first time.[121]

Mexico, Brazil, Ecuador, Colombia, Indonesia and South Korea needed US dollars to respond to liquidity crises ("US dollar shortages"), and their responses varied in the combination of their monetary stabilisers, i.e. their ILOLRs. In addition, it is relevant to note that Brazil, Mexico and South Korea are classified by the IMF as three of the 29 biggest most interconnected economies and financial centres in the world.[122]

The biggest EMEs (Brazil, Mexico, South Korea and Indonesia) chose ad hoc bilateral arrangements rather than formalized and preexisting monetary arrangements at the regional and/or multilateral levels to respond to the crisis. Ecuador accessed the regional arrangement rather than the IMF, and drew only on its SDR allocations, and not on the IMF lending facilities. After the immediate crisis resolution, all these countries, except Mexico, decided to invest more in regional monetary arrangements, even though only Ecuador had relied on a regional response in the crisis.

Below I describe the monetary responses for each of those countries, comparing the response to the 2008 crisis response to the 1990s, allowing for a later. The countries are grouped in paired comparison based on shared traits, allowing for clearer analysis of ILOLR preferences.

Brazil and Mexico

During the 1990s, both Brazil and Mexico relied mainly on multilateral organisations. Brazil formalized a Stand-by Arrangement with the IMF in December 1998 (equivalent to USD 18bn).[123] Brazil also had access to World Bank (WB) and Inter-American Development Bank (IADB) loans (total of USD 9bn, each USD 4.5 bn), and to a BIS multilateral guarantee to be gathered from among its members with a total amount of USD 13.1, of which USD 5bn came from the US Exchange Stabilization Fund[124] and USD 1.25bn from the Bank of Japan's swap line.[125] In 1994, Mexico drew on the IMF (USD 17.8 bn), the WB (USD 17.8 bn), the IADB (USD 1.3bn) and on bilateral commitments (total of USD 21bn, including the US Stabilization Fund and the Fed swaps under NAFTA).[126]

In 2008, instead of resorting mainly to support at the multilateral level, both Latin American countries combined reserve accumulation with ad hoc and temporary bilateral swap agreements with the Fed (USD 30bn each). Eight days before the Fed's announcement, President Lula of Brazil issued a special law (Medida Provisoria 443), with immediate effect, authorizing the Brazilian central bank to formalize any swap operation with its foreign peers. However, Brazil decided not to draw on the Fed's swap lines, simply using the arrangements as a precautionary tool instead. Mexico also had access to the Flexible Credit Line (FCL) of the IMF (USD 70bn), but did not draw on this, only on its agreement with the Fed. For Brazil, there was no regional monetary arrangement in place in the aftermath of 2008 crisis, but Mexico had the possibility of activating swap lines under the NAFTA agreement. It chose not to do so, perhaps because the NAFTA swap lines were not large enough to meet Mexico's needs (only USD 9bn).[127]

In relation to the IMF, it is worth it to mention that those countries' SDR allocations were too small for their liquidity needs. In 2009, a total of SDR 2.8 bn (USD 4bn each) was assigned to Brazil and Mexico. Their bilateral swaps with the Fed, during the 2008 crisis, widely outstrip their SDR holdings. Since 2011, Brazil is permanently using 10% of its allocation. From 2010 and March 2015, Mexico used

from 2% to 11% of its allocation. The SDR continues not to be a useful source of liquidity for those EME countries.

Mexico is still a part of the IMF FCL agreement and seems to be suffering from the exit stigma (IMF, 2014). In 2011, Brazil considered joining the FLAR (the Latin American Reserve Fund, total of USD 3,6bn),[128] but decided to invest in the BRICS monetary arrangement instead, which was created in July 2014 (total of USD 100bn). In the FLAR, Brazil could only be a provider, and not a recipient of resources.

The BRICS Contingent Reserve Arrangement (CRA) is almost a copy of the CMIM, with a very different legal structure compared to the FLAR or the IMF. There is no international organization as central counterparty between surplus and deficit. It is a more "flexible" (although formalised) agreement: a multilateral legal framework for bilateral swap agreements in US dollars between central banks. Central banks retain ownership of their reserves until other monetary authorities request activation of the swap. A Standing Committee is responsible for evaluating these requests.[129] The BRICS' CRA includes a list of reasons that justify non-activation of a swap by a providing party related to the country's "balance of payments and reserve position, or by an event of force majeure" (article 15.c, Treaty for the Establishment of a BRICS Contingent Reserve Arrangement -Fortaleza, July 15). In March 2013, the Brazil's central bank formalized a local currency swap with the People's Bank of China (PBoC), but the announcement clearly stated that it is only for trade purposes (up to RMB 190bn and R\$ 60bn).[130]

At the multilateral level, both Latin American countries have become lenders to the IMF. Brazil entered into a note purchase agreement of USD 10bn (between 2009 and 2010) and formalized a NAB of USD 12bn (between 2011 and 2015). Mexico also formalized a NAB with the Fund, at a total of USD 7bn between 2011 and 2015, and a note purchase agreement in a total amount of USD 9bn in 2013.

Ecuador and Colombia

Both Ecuador and Colombia are members of a well-established regional monetary arrangement, the FLAR. Ecuador combined an IMF Stand-By Arrangement in 2000 (USD 314 million)[131] with two previous FLAR loans in 1998 (up to USD 493 million). Also, since 1984, Ecuador used its allocations of SDRs (the equivalent of USD 45 million) as a quasi-permanent resource. Colombia only had access to liquidity and contingent FLAR loans in 1999 (total of USD 500 million), but did not request IMF support.[132]

Recently, however, Ecuador chose to only use FLAR loans to cope with the crisis in three instances: 2009 (USD 480million), 2010 (USD 515million) and again in 2014 (USD 618million). It could have asked for access to the IMF's new legal instrument aimed at members with sound economic policies and fundamentals, but with some remaining vulnerabilities: the Precautionary Credit Line (PCL), renamed PLL after the IMF review in 2011. But until today, only Morocco has made a formal request to this new facility (IMF, 2014: 4-5).

Nonetheless, Ecuador is currently using the total of its SDR allocation (since 2009, a total of USD 411 million). This suggests that the SDR is useful only for smaller EMEs. Since there is no obligation of reconstitution, this new general allocation in 2009 made the SDR a quasi-permanent transfer to countries like Ecuador.

In turn, Colombia only asked for IMF support through the FCL in 2010 (total of USD 3,28bn expanded to USD 5,4bn in 2013). Mexico and Colombia, traditional US partners, along with Poland, are the only EME countries in the world that have used the FCL and all three still remain attached to the agreement. Colombian SDR allocation, however, is clearly very small for its needs (since 2009, only USD 1bn of which it has used less than 2%). In 2008, it seems that the FLAR had insufficient resources to meet Colombia's needs.

Interestingly, after 2012, FLAR member countries decided to increase their contributions to the fund (from USD 2,3bn to USD 3,6bn) and expand its membership to Uruguay (2009) and Paraguay (2014).[133] Colombia and Ecuador are still investing in this regional fund.

Indonesia and South Korea

In the 1990s, both Indonesia and South Korea relied on formal multilateral responses. Indonesia combined the IMF arrangements (USD 10bn) with assistance from the World Bank (USD 4.5bn), Asian Development Bank (ADB) (USD 3.5bn) and bilateral commitments (USD 22bn). South Korea formalized an IMF agreement (USD 21bn) and drew on support from the World Bank (USD 10bn), ADB (USD 4bn) and bilateral commitments as well (USD 22bn).[134] Among the bilateral arrangements, the role of the US Treasury, particularly the US Exchange Stabilization Fund, is worth it mentioning for these countries - up to USD 5bn to South Korea and up to USD 3bn to Indonesia, but neither were drawn down (Henning, 1999:75-77).

An important political event for Asian countries was the creation, in 2000, of the regional Chiang Mai Initiative (CMI). For Asia, it was an important movement towards regional monetary cooperation.[135] The CMI was established as a network of bilateral currency swaps denominated in US dollars (USD 80bn).

In the 2008 crisis, however, Indonesia and South Korea resorted to unilateral action (reserve accumulation), as their main international monetary policy since Asian crisis. When confronted with the choice of monetary cooperation, despite the existence of the CMI with total capacity of USD 80bn at the time and the IMF new facilities in 2009, they preferred to resort to ad hoc and temporary bilateral currency swap agreements with the Fed approved for South Korea (up to USD 30bn), but denied to Indonesia (Chey, 2012). South Korea also had a bilateral swap in US dollars with the Bank of Japan (USD 10bn) outside the CMI framework. This agreement was agreed to expire in February 2015, though.[136]

Indonesia combined (a) the expansion of bilateral swaps with the Bank of Japan (from February 2009, total amount of USD 12bn) on ad hoc basis outside the CMI framework; and (b) a syndicated loan coordinated by the WB with the ADB, Japan and Australian governments (total amount of USD 5.5bn).[137]

South Korean and Indonesian allocations of SDR were far too small to cover their needs. Since the general allocations of 2009, they have USD 3.4bn and USD 2.8bn, respectively. Indonesia is using 11% of its holdings since the allocation, and South Korea is using less, at about 5% since 2010.

In addition, we must note that South Korea is also acting as lender to the IMF through the NAB (up to USD 9.2bn between 2011 and 2015) and a loan agreement (up to USD 15bn between 2012 and 2015).

Despite the fact that the CMI went unused in the 2008 crisis, Asian countries decided to improve the regional monetary agreement - then renamed as Chiang Mai Initiative Multilateralization - investing in (i) a multilateral framework for bilateral swap lines with a single contractual agreement, (ii) creating a precautionary instrument (inspired by the IMF FCL and PLL) and a regional macroeconomic research office, adding a surveillance pillar to the arrangement; (iii) expanding the total contribution (from initially USD 80bn reaching USD 240bn in 2014); and (iv) decreasing the de jure link with IMF programs (from 80% to 70%).[138] These improvements again demonstrated these countries desire for alternatives to multilateral institutions.

Another important development in monetary relations, especially in the region, is related to the policy of Renminbi internationalisation. The PBoC formalized bilateral swaps in local currency with South Korea (Bank of Korea) in December 2008 (up to RMB 180bn, reaching CNY 360bn and KRW 64tn in 2011), and with Indonesia in March 2009 (up to RMB 100bn). These swap announcements make references not only to trade purposes, but also to short-term liquidity facilities.[139]

In October 2013, the Bank of Korea and the Bank Indonesia formalized a local currency swap in the total amount of 10.7tn won and 115tn rupiah, to promote bilateral trade and "further strengthen financial cooperation". South Korea has also a local currency swap agreement with the Bank of Malaysia (up to KRW 5tn and MYR 15bn) signed on October 2013, but the references are only to support trade settlement. In February 2014, the Bank of Australia (up to KRW 5tn and A\$ 5bn) for trade purposes, but "the agreement can also be used for other, mutually agreed purposes".[140]

What accounts for the empirical variation?

The comparative analysis of the ILOLR for these six countries, the biggest EME in Latin America and Asia, reveals important changes in ILOLR politics and institutional structures in comparison with the 1990s.

Table 2 summarizes the main findings of the empirical research.

The table reveals interesting developments. First, there is a decreasing role for multilateral institutions as ILOLRs, for the biggest EMEs in Latin America and Asia. The IMF FCL "trap" and the very limited role played by the SDR reinforce this trend. The SDR is suffering from its small allocation, and from the absence of restitution requirements. Ecuador is using the SDR as a quasi-permanent resource rather than a reserve asset with precautionary purposes. That was not the function originally conceived for this asset (Gold, 1981-1982; Gianviti, 1998). The ILOLR institutional design (i.e. the supply side) can explain this empirical result. The non-recourse to the FLAR by Colombia during the 2008 crisis can also be explained by a supply-side factor, i.e. the lack of technical capability.

Nevertheless, the failure of both, the IMF and the first version of the regional monetary arrangement in Asia (CMI) is difficult to attribute only to the institutional design. Despite the relatively small size of the CMI in 2008, its de jure link with the IMF (80% of the amount to be accessed by each Asian country) played a role in reinforcing the factors on the EME demand side.

Table 2. Outcomes in EME monetary cooperation: the 1990s and the 2008 currency crisis as well as post-crisis institutionalization

EME	ILOLR	ILOLR	ILOLR institutionalization process
Countries	in the 1990s	in 2008 crisis	in 2008 post-crisis
Brazil	IMF, WB, IADB and other bilateral commitments (including, US ESF)	Fed swap	BRICS CRA ¹ As lender of the IMF, NAB and note purchase
Mexico	IMF, WB, IADB and other bilateral commitments (including, US ESF)	Fed swap and IMF	IMF FCL "trap"* and NAFTA swaps As lender of the IMF, NAB and note purchase
Colombia	FLAR	IMF	IMF FCL "trap"* and FLAR reinforcement
Ecuador	FLAR, IMF and SDRs	FLAR and SDRs	FLAR reinforcement
Indonesia	IMF, WB, ADB and other bilateral loans (including, US ESF)	Bank of Japan swap; WB; ADB; Australian and Japanese loans	CMIM reinforcement, PBoC, Bank of Korea and Bank of Japan swaps
South Korea	IMF, WB, ADB and other bilateral loans (including, US ESF)	Fed and Bank of Japan swaps	CMIM reinforcement, PBoC, Bank Indonesia and Reserve Bank of Australia swaps ² As lender of the IMF, NAB and loan agreement

* Exit stigma to be dealt with (IMF, 2014).

Source: IMF, World Bank, Central bank websites, Kindleberger and Aliber (2011 [1978]: 254, 311), Henning (1999: 75-80).

To understand the ILOLR institutionalisation process in the post-crisis period, factors related to the demand side also need to be analysed. But, to investigate the second hypothesis of this study connected to the role of political stigma and central bank governance (i.e. H.1.1 and H.1.2), it is important to add more information.

From Table 2, we know that there are important changes in the institutional design and practice of the ILOLR in comparison with the 1990s: (i) EME countries of this sample are relying more on central banks and currency swaps to respond to the 2008 crisis and to redesign ILOLR for the next economic meltdown; (ii) the regional responses are also changing their nature, i.e. from central counterparties (FLAR) towards agreements on network of bilateral swaps (e.g., the BRICS CRA and the CMIM, bigger in size and economic power of their members); (iii) central bank swaps are not only denominated in US dollars, but also in local currencies, with a growing importance for the Chinese Renminbi; and (iv) the IMF could perhaps be a future alternative as the bigger EMEs are investing as lenders to the Fund, but maintaining their ownership over the reserves, probably waiting for a change in the Fund's governance structure.

My main argument is that the current ILOLR institutional practice and design are a combination of past experience (political stigma towards the IMF) and the growing power of national central banks (summarized by the Table 1, above). The adequacy of the IMF programs was very contested during the 2000s,[141] and the politics of reserve accumulation seemed to be the way that EME found to create more independence at the international system.

At the same time that this model of monetary action reinforced international independence for the biggest EMEs, it suggests strengthening of central bank power. Central banks manage this policy at the national level and, consequently, this fact tends to reinforce their role in defining monetary politics. Once the 2008 crisis hit, exchange rate, monetary policies and cross-border liquidity in foreign currencies became closely connected, the power to deal with the crisis was delegated to central banks, including in EME countries. The EME actions on reserve accumulation could be seen in the table 3, on the next page.

Table 3. EME foreign reserve accumulation during the 1990s and in the post-2008 crisis (in USD billions)

Country	Indicator	1993	1994	1998	1999	2008	2009	2012	2013
Brazil	Foreign reserves	\$31,7	\$38,4	\$43,9 e	\$36,3	\$193,7	\$238,5	\$373,1	\$358,8
	GDP	\$438	\$546	\$843	\$586	\$1.653	\$1.620	\$2.248	\$2.245
	Reserves/ GDP	7,2%	7,0%	5,2%	6,2%	11,7%	14,7%	16,6%	15,9%
	Total reserves	\$25,2	\$6,4	\$31,8	\$31,8	\$95,2	\$99,8	\$167	\$180,2
Mexico	Total GDP	\$503	\$527	\$502	\$579	\$1.099	\$895	\$1.186	\$1.260
	Reserves/ GDP	5,0%	1,2%	6,3%	5,5%	8,6%	11,2%	14,1%	14,3%
	Total reserves	\$8	\$8	\$8,7	\$8,1	\$23,6	\$24,9	\$36,9	\$43,1
Colombia	Total GDP	\$55	\$81	\$98	\$86	\$244	\$233	\$370	\$378
	Reserves/ GDP	14,4%	9,9%	8,9%	9,4%	9,7%	10,7%	10%	11,4%
Ecuador	Total reserves	\$1,5	\$2,0	\$1,7	\$1,8	\$4,4	\$3,7	\$2,4	\$4,3
	Total GDP	\$18,9	\$22,7	\$27,9	\$19,6	\$61,7	\$62,5	\$87,6	\$94,4
	Reserves/ GDP	8,1%	8,8%	6,2%	9,6%	7,2%	6,0%	2,8%	4,6%
Indonesia	Total reserves	\$12,4	\$13,3	\$23,6	\$27,3	\$51,6	\$66,1	\$112,7	\$99,3
	Total GDP	\$158	\$176	\$95	\$140	\$510	\$539	\$876	\$868
	Reserves/ GDP	7,9%	7,5%	24,7%	19,5%	10,1%	12,2%	12,9%	11,4%
South Korea	Total reserves	\$20,3	\$25,7	\$52,0	\$74,1	\$201,5	\$270,4	\$327,7	\$345,6
	Total GDP	\$391	\$458	\$376	\$486	\$1.002	\$901	\$1.222	\$1.304
	Reserves/ GDP	5,2%	5,6%	13,8%	15,2%	20,1%	30%	26,8%	26,5%

Source: World Bank (GDP: Gross Domestic Product).

Table 3 shows that foreign reserve accumulation was a practice reinforced during and in the aftermath of the 2008 crisis. The smallest country in the sample, Ecuador, has the lowest level of foreign reserves in relation to its GDP, despite having a dollarized economy. That suggests that the accumulation of foreign reserves is a costly policy, and only the biggest EMEs can sustain this model of unilateral

action.[142] In addition, Mexico and Colombia might be preparing their economies to exit from the FCL formalized with the IMF.

This study suggests that central bank power is related to its relative (de jure or de facto) degree of autonomy at the national level (political power), and the size of the foreign reserve under its management (economic power). The combination of both might help predict the outcomes in ILOLR responses (demand side perspective) – tables 4 and 5, below.

Table 4. EME central bank power composite: political and economic perspectives

EME countries	Central Bank Independence CBI index (Dincer and Eichengreen, 2010) From 0 (low level of CBI) to 1 (high level of CBI)	Foreign Reserves and GDP ratio in 2008 and 2013	Composite for central bank power
Brazil	No formal CBI, but de facto independence Informally independent during Lula and Cardoso government s (1999- 2010). Dilma Presidency changed this political agreement in August 2011 ¹	11,7% ; 15,9%	+ +
Mexico	0,63	8,6% ; 14,3%	+
Colombia	0,29	9,7% ; 11,4%	-
Ecuador	No CBI There is no monetary policy (dollarized economy)	7,2% ; 4,6%	
Indonesia	0,73	10,1% ; 11,4%	+
South Korea	0,32	20,1% ; 26,4%	+

Source: Dincer and Eichengreen, 2010; World Bank.

Table 5. EME past experience, central bank power and outcomes for the ILOLR design in 2008 and post-crisis – predicted by this study and actual outcomes (H.1.1 and H.1.2.)

EME countries	Past experience H.1.1	Composite for the index of central bank power H.1.2 and Table 4,	Predicted outcomes for monetary cooperation	Actual outcomes for monetary cooperation
Brazil	High political stigma	+ +	Bilateral swaps Regional arrangements based on swaps	Bilateral swaps Regional arrangements based on swaps IMF NAB
Mexico	Low political stigma	+	Bilateral swaps Regional arrangements based on swaps	Bilateral swaps Regional arrangements based on swaps IMF FCL IMF NAB
Colombia	Low political stigma	-	Regional arrangement based on IO IMF lending facility	Regional arrangement based on IO IMF FCL
Ecuador	High political stigma		Regional arrangement based on IO	Regional arrangement based on IO IMF SDRs
Indonesia	High political stigma	+	Bilateral swaps Regional arrangement based on swaps	Bilateral swaps Regional arrangement based on swaps Other multilateral institutions (but not the IMF)
South Korea	High political stigma	+	Bilateral swaps Regional arrangements based on swaps	Bilateral swaps Regional arrangements based on swaps IMF NAB

Source: Formulated by the author.

The Brazilian central bank has no de jure independence, and Ecuador is a dollarized economy. However, Brazil's central bank could define the choices on ILOLR mainly based on its economic power (size of foreign reserves), and its de facto autonomy granted between 1999 and 2011 by an informal agreement between the Presidency and the central bank.[143] South Korea has a central position with low level of political autonomy, but the highest reserve ratio among the EMEs in this sample.

Colombia's preference for regional and multilateral responses (based on international organisations, rather than on swap lines) is explained by a combination of low CBI and low levels of foreign reserves, combined with low political stigma towards the IMF. Colombia did not have a previous experience with the IMF in the 1990s, and is traditionally considered to be a US ally, therefore less reluctant to work with a seemingly US-led IMF. In addition, the FLAR head office is in Bogotá, which tends to expand the influence of this regional institution in this country.

The central banks of Mexico and Indonesia have similar central bank power: a combination of certain degree of autonomy and economic power at the national level, but a smaller size for their reserves if compared to others.[144] However, their ILOLRs were very different. The comparison between these two elements demonstrates the effect of political stigma on their monetary choices on ILOLR. Mexico, despite the power of its central bank, combined a currency swap with the Fed (first line of defence) with an IMF agreement. The latter option is likely a consequence of Mexico's low political stigma towards the IMF and its political and economic alliance with the US. Also, Mexico's ILOLR needs were not sufficiently covered by the Fed.

By contrast, Indonesia points the opposite way. It is the only country represented at the IMF by its central bank governor, unlike the other big EMEs in this sample, which are represented by their finance ministers. This arrangement could be expected to bring Indonesia's monetary authority into dialogue with the IMF.[145] However, the political stigma towards the Fund is very high in Indonesia and this blocked its use as ILOLR in 2008, even if the IMF was capable and willing to act as ILOLR. What my model did not predict was the combination of bilateral swaps with other multilateral arrangements. In the Indonesian case, it seems that its economic power was not

sufficient to assure a relevant financial size for the bilateral swaps, and it needed more sources of financing to cope with the crisis – but the IMF was avoided.

In this sense, even if new IMF instruments were created without conditions, and with precautionary purposes (mainly, the FCL and the PLL), the EMEs' past experience and their powerful central banks changed the focus of monetary cooperation towards bilateral swaps and, in the post-crisis period, to the reinforcement of regional structures based on currency swaps.

Nonetheless, the IMF is not completely avoided by the EMEs as a site for monetary cooperation. That was not predicted by my model. Brazil, Mexico and South Korea acted as lenders to the Fund in the post-crisis period. EME countries are still investing in multilateral organisations, but as lenders, rather than borrowers. The enduring political power of finance ministers plays a role here. These countries also participated in the creation of the FCL and the PLL at the Fund, even if they did not ask for this support themselves.

Since the IMS institutional structure does not correspond to the shift in economic power, EMEs preferred to also formalise new forms of monetary cooperation at the regional and bilateral levels in the aftermath of the crisis. Especially after 2009, with the failure of G20 reforms on the IMS and the launch of the quantitative easing (QE) by the American Federal Reserve with spill over effects (referred to as "currency wars" by the former Brazilian minister of finance Guido Mantega), these EMEs (except Mexico) started to deepen regional and bilateral arrangements, creating alternatives to unilateral reserve accumulation. This movement is reinforcing a multi-layered monetary system.

The institutional structures are reflecting this movement in politics: from centralised and well-established monetary organisations, based on central counterparties at the multilateral level towards flexible, but formalised regional and bilateral networks of currency swaps. Finally, we must note the persistence of a special characteristic of these swap instruments: the bilateral and regional agreements continue to be mainly in US dollars. This reveals the persistent role of this currency as the main reserve asset and means of payment at the international system. At least for the EMEs in this sample, the international economic order is still a quasi-unipolar world (Cohen and Benney, 2014).[146] However, the slow, but sure emergence of bilateral swaps in local currencies (PBoC as well as South Korea and Indonesia's swaps), could reveal a tendency to create alternatives. Global liquidity tends to be more diversified.

5) Conclusion: theoretical and policy implications of this study

The ILOLR relationship is not only a matter of institutional supply and design. To understand the variation in outcomes in monetary cooperation in the 1990s, and during the 2008 crisis, one must also analyse the demand side of the equation, specifically the point of view of the biggest EMEs.

My empirical research suggests that central banks with a certain degree of political autonomy, and high levels of economic power (acquired through the accumulation of foreign reserves), are reshaping the monetary responses of the biggest states in Latin America and Asia. Currency swaps and regional arrangements based on swaps have become the most important institutional form of cooperation between these biggest EME.

Furthermore, this research argues that the politics of foreign reserve accumulation (and its economic consequence in transferring resources from EMEs towards developed countries) had an important secondary effect: it created more independence for the biggest EMEs in the IMS. In fact, EMEs' build-up foreign reserves to avoid vulnerability in an IMS based on currencies controlled by developed country central banks, which led to greater room for manoeuvre for EMEs. Furthermore, central banks are the main national agents inside these states that are shaping the institutional design of the EME political choices.

The empirical research also revealed that accounts focusing on the institutional design of ILOLRs (the supply side) have low explanatory power to elucidate EMEs' monetary choices in the 2008 crisis and its aftermath. Issues of global power and the international distribution of gains are more important to these biggest countries in Latin America and Asia, even when compared to the cost benefits of using multilateral ILOLRs. The economic and transactional costs of flexible (though formalised) models of cooperation can be high: these arrangements, including networks of swaps, generate more uncertainty about the access to liquidity in times of crisis. The CMIM and the BRICS' CRA, for example, allow a providing party to justify a non-activation of swap. In spite of these costs and uncertainties, these arrangements are the preferred institutional design of monetary cooperation in 2008 post-crisis.

Finally, what are the policy implications of this study? The IMF should consider the effects of experience and the global role of the central banks to rethink its institutional design. The Fund may be most effective, if it gives up its financial role in crisis prevention for the biggest EME countries, and incorporates their interests inside the institution, treating them as peers of developed countries. The assignment of the NABs by these EME countries reveals an interest in engagement with the Fund on these terms. It seems that the IMF, as a financial actor, is not suitable today to deal with crisis prevention for these biggest EME countries, but mainly for small countries and those in more serious disruptions. Only in the last case, can its role as imposer of conditions create good signals for markets, and support imposing behavioural regional structures in norms on their neighbours (a difficult task for regional partners). In fact, the IMF should improve the nature of its conditions, and not rule them out of its framework.

Most importantly, central bank cooperation re-emerged with force since the 2008 crisis. Monetary authorities gained more credibility and power to build international monetary relations. They are a very important international political actor in this domain. In this new constellation of monetary cooperation, the Fund cannot and should not replace the biggest EME central banks in their financial role. Bilateral swap arrangements, renewed from the past experience of Bretton Woods I, have again become central. This time, however, the swap networks have grown dramatically in size, and are not only the preserve of developed central banks, but are also established among emerging powers, including in local currencies. The IMS is becoming even more fragmented and diverse in terms of global liquidity.

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Chapter 6 Notes

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[96] The foundations for the role of lender of last resort were first set out by Thornton in 1802. For a comprehensive framework of this function, see Lastra (2015: 150-160).

[97] Chey (2012) and McDowell (2015) are exceptions. However, Chey (2012) does not distinguish between the interest of the US and its central bank, the Fed, which tends to diminish the paper's explanatory power. McDowell (2015) is more focused on EME economic rationalities at the international level (an economic process model) rather than the political and institutional changes at the national level that shape monetary responses to liquidity crisis.

[98] I would like to thank Professor Bob Keohane to bring this theoretical implication to my attention.

[99] The accumulation of reserves can also have non-precautionary purposes. Foreign reserves can be used as an instrument for interventions in foreign exchange markets with the aim of promoting trade policies.

[100] This regional monetary arrangement is formed by the ten members of the Association of Southeast Asian Nations (ASEAN) and Japan, China and South Korea ("plus 3" countries). For a perspective of the Asian regional economic integration as a contested rescaling of economic governance, see Hameiri and Wilson (2015). See also Grimes (2011).

[101] Current research implies that the Fed chose swap partner countries mainly according to the exposures of US bank and the size of the US dollar shortages in big financial centres (Allen and Moessner, 2010; Aizenman and Pasricha; 2010; McDowell, 2012; Broz, 2013).

[102] "Owing to the formation of the European Central Bank and in light of 15 years of disuse, the bilateral swap arrangements of the Federal Reserve with the Austrian National Bank, the National Bank of Belgium, the Bank of France, the German Federal Bank, the Bank of Italy and the Netherlands Bank were jointly deemed no longer to be necessary in view of the well established present-day arrangements for international monetary cooperation. Accordingly, it was agreed by all the bilateral parties to allow them to lapse. Similarly, it was jointly agreed to allow the bilateral swap arrangements between the Federal Reserve and the National Bank of Denmark, the Bank of England, the Bank of Japan, the Bank of Norway, the Bank of Sweden, the Swiss National Bank, and the Bank for International Settlements to lapse in light of their disuse and present day arrangements for international monetary cooperation" (US Fed, FOMC minutes, 17 November 1998, available at: http://www.federalreserve.gov/fomc/minutes/19981117.htm).

[103] The FLAR is an international financial organization originally established in 1976, as the Fondo Andino de Reservas. Currently, the FLAR members are Bolivia, Colombia, Costa Rica, Ecuador, Paraguay, Peru, Uruguay and Venezuela. It is based in Bogotá, Colombia.

[104] Helleiner (2014) develops a very interesting account of this process.

[105] The SDR is not a currency, nor a liability of the Fund. The SDR is only an official reserve asset that represents an unconditional liquidity destined to the IMF members. It is allocated and not issued by the Fund. They are potential claims on members' freely usable currencies. The SDRs are properly credit lines among all the SDR Department's participants (Lastra, 2015: 449).

[106] In the 1990s, the Fed gave access to a USD 9bn currency swaps to Mexico's central bank.

[107] The Independent Evaluation Office of the IMF offers an account of this perception and the process of "learning from experience" (IEO, 2014: 20-24). However, as pointed by Woods (2006), IMF policies are not only defined by powerful member countries, but also driven by economic ideas and the international organisation's staff (the role of bureaucracy).

[108] Only three countries requested access to the FCL (Mexico, Colombia and Poland) and only one to the PLL (Morocco) (IMF, 2014: 4-5).

[109] Data IMF Currency Composition of Foreign Reserves (COFER). This data does not include China, which classifies reserves as a matter of state secrecy. Economists estimate that China holds almost USD 4tn in reserves and has been cutting back since 2014. See: Japan Times, "Worlds foreign currency reserves falling after hitting peak of 12-trillion", 7 April 2015, available at: http://www.japantimes.co.jp/news/2015/04/07/business/worldsforeign-currency-reserves-falling-after-hitting-peak-of-12trillion/#.VUCZXWa89FV). [110] This could be characterized as a dependent monetary system because "the accumulation and expansion of capital cannot find its essential dynamic component inside the system" (Cardoso and Falletto, 1979: 20).

[111] The category of "large emerging countries" is used by the IEO to refer to 16 countries defined by the IMF as "emerging and developing" with a GDP above U\$300 billion PPP.

[112] This information was extracted from the IMF website. I considered all the annual reports available from 1989 to 2014.

[113] For more see the public information note issued on September 3, 2010 at: http://www.imf.org/external/np/sec/pn/2010/pn10124.htm

[114] See joint statement at the Fed's website available at: http://www.federalreserve.gov/newsevents/press/monetary/2013103 1a.htm

[115] See Chey (2012).

[116] I would like to thank Helleiner for this insightful debate

[117] As already suggested by Eichengreen (2011).

[118] The unconditional portion corresponded, at the time of the crisis, to 20% of the total amount that each Asian country could have access through the CMI. For the remaining 80%, the receiving country needed an IMF program formalized prior to the CMI swap activation.

[119] See the World Economic Outlook report available at:

http://www.imf.org/external/Pubs/ft/weo/2014/01/pdf/text.pdf. For an analysis on the differences between the IMF, the United Nations Development Programme and the World Bank classifications of development, see Nielsen (2011).

[120] See the list on page 10 of the IMF Review of Recent Crisis Programs, September 2009, available at:

https://www.imf.org/external/np/pp/eng/2009/091409.pdf

[121] Although Chile is a big and important country in Latin America, it used its own foreign reserves to cope with the 2008 crisis (unilateral action) and accessed the IMF only during the 1980s.

 [123] This agreement was renewed in September 2001 (SDR 12bnequivalent to USD 16bn). Brazil drew on 72% and 93% of the total amount of these facilities, respectively (IMF data). The agreement between Brazil and the IMF in 2002 was attributed mainly to the elections and the transition to the left party (the Worker Party) and is not included in the previous figure.

[124] See the Message to the US Congress Reporting on United States Participation in a Multilateral Guarantee of a Credit for Brazil, Administration of William J. Clinton June 15, 1999, available at: http://www.gpo.gov/fdsys/pkg/WCPD-1999-06-21/pdf/WCPD-1999-06-21-Pg1115.pdf. Also, see the account of this event by Henning (1999: 79-80).

[125] Source: IMF data and Folha de São Paulo (http://www1.folha.uol.com.br/fsp/dinheiro/fi03129802.htm).

[126] Source: Kindleberger and Aliber (2011 [1978]: 254) and IMF.

[127] http://acf.eabr.org/e/parthners_acf_e/RFAs_acf_e/NAFA_e/ See also: http://www.federalreserve.gov/fomc/minutes/19981117.htm

[128] See the Brazilian Minister of Finance declaration at: http://www.bloomberg.com/news/2011-08-12/south-americafinancial-stability-fund-gets-backing-from-brazil-argentina.html [129] The BRICS CRA is not yet operative, since it is waiting for an agreement between central banks on how to manage the system. For more details about the BRICS CRA, see its treaty published at Brazilian Ministry of Foreign Affairs website:

http://brics6.itamaraty.gov.br/media2/press-releases/220-treaty-forthe-establishment-of-a-brics-contingent-reserve-arrangementfortaleza-july-15

[130] See the announcement at the Brazil's central bank website: http://www.bcb.gov.br/pt-br/Paginas/bancos-centrais-do-brasil-e-dachina-estabelecem-acordo-de-swap-de-moeda-26-03-2013.aspx. The swap contract is classified as confidential.

[131] Source: IMF data. In 2003, Ecuador concluded another agreement with the IMF (up to SDR 151 mil).

[132] Source FLAR and IMF, country information.

[133] For the history of the FLAR, see Ocampo and Titelman (2012).

[134] IMF and Kindleberger and Aliber (2011[1978]).

[135] For the history of the creation of the CMI and its development (from the Japanese proposal of an Asian Monetary Fund through to the establishment of the CMIM), see Sussangkarn (2011). [136] See: http://www.businesskorea.co.kr/article/9109/korea-japan-finances-korea-japan-currency-swap-agreement-expires

[137] See the official announcements at:

http://www.boj.or.jp/en/announcements/release_2009/un0904a.htm/; http://www.boj.or.jp/en/announcements/release_2008/ind0806a.htm/ and

http://www.boj.or.jp/en/announcements/release_2014/rel140110a.pdf . For the announcement of the Indonesian syndicated loan see: http://www.ft.com/cms/s/0/b34b15bc-086f-11de-8a33-0000779fd2ac.html. Also, the Bank of Japan formalized a bilateral currency swap in US dollars with the Reserve Bank of India.

[138] See Sussangkarn (2011) and Grimes (2011).

[139] See announcements on the PBoC website and Allen and Moessner (2010). The swap contract itself is unavailable, as it is classified under state secrecy.

[140] See public announcements at the Bank of Korea website (http://eng.bok.or.kr/eng/).

[141] A powerful image of this political stigma is represented by M. Camdessus, managing director of the IMF during the 1990s, standing over the Indonesian President Suharto signing publicly the Fund's agreement in 1997.

[142] Furthermore, it could eventually reveal moral hazard since Ecuador can rely on almost automatic and unconditional regional response (and on its SDR allocations). The FLAR affirms in its website that, until now, there was no conditionality for its loans. Measures proposed by the governments were usually accepted. See also Ocampo and Titelman (2012).

[143] Since the introduction of the inflation targeting system through a Presidential Decree (Decree 3088, 1999), the Brazilian central bank has gained independence on monetary policy implementation. During Lula's government, the governor of the Brazil's central bank stayed in power 8 years, an unprecedented event in Brazilian history. For an account of the monetary history in Brazil, see Duran (2012).

[144] Mexico can rely on an implicit US support in times of crisis. US helped Mexico in 1994 (with NAFTA swap lines and a directly US lending through the Exchange Stabilisation Fund) and again in 2008 (trough Fed swap lines outside the NAFTA).

[145] Colombia had very low participation and Ecuador never participated of these meetings. This information was extracted from the IMF website. I considered all the annual reports available from 1989 to 2014.

[146] For the EMEs of this sample, the Eichengreen (2011) hypothesis is not yet confirmed.

7. Minsky's Irreconcilable Masters Governing Financial Regulation and Financial Structure

Jan Kregel

The Two Masters

Confronted with the need to reform Glass-Steagall legislation in the US in the 1980s Hy, Minsky highlighted an irresoluble contradiction that made the design of an ideal regulatory system capable of providing financial stability impossible. He spent the last years of his life trying to resolve this contradiction.

The contradiction arose from the need of financial regulation to serve two conflicting objectives: "Any capitalist banking and financial system needs to serve two masters: one master requires assurance that the financing needed for the capital development of the economy will be forthcoming, the other master requires assurance that a safe and secure payments mechanism will be provided. (...) It (...) needs to be understood now that development financing involves taking risks, that projects would not perform up to the expectations of their promoters and financiers, and opens the way for fraud and unsafe banking procedures." Thus the "need is for a regulatory and supervising authority for the financial system that accepts that financing development opens the system to losses that have the potential for adversely affecting the safety and security of the economy's payment facilities. (...) To allow this possibility, the regulators need to try to insulate the payments system from the consequences of such losses. The problem, therefore, is to provide for protecting the payments system from the consequences of the losses which may ensue from development financing." (Minsky, 1994:10-11).

Since the means of payment and savings vehicles are broadly defined as the liabilities of the financial system, and the financing of productive investment involves the financial system acquisition of the productive assets of the system, making the former riskless would require the limitation of the holdings of financial institutions to riskfree assets. Thus, one regulatory proposal that reappears periodically to safeguard the payments system is to restrict the assets held by financial institutions, issuing means of payment to risk-free government securities or 100% gold reserves. While such proposals serve the needs of one master, they leave the objective of financing inherently risky productive investment to private, unregulated institutions. As pointed out elsewhere (Kregel, 2012), this proposal implies that the rate of investment would be limited by private saving, and fail to insure stable growth of output and employment. In simple terms, stability of the payments system would be produced at the price of increased instability in the overall economic system.

But, more importantly, these proposals mistake the essence of the role modern monetary systems in capitalist development which has been recognized, at least since the 19th century. A fuller understanding of these developments provides insight into an alternative resolution to Minsky's regulatory contradiction.

Understanding the Operation of the Payments Systems and Financial Instability: Theory and Practice

As Minsky argued in his early work, any discussion of financial regulation presupposes the existence of a theoretical explanation of the operation of the economic and credit system, in which instability redundant: "The possible, otherwise regulation is risk is characteristics of banking, and the tasks of bank regulators are different in a world in which instability is a present danger than in a world in which markets are stable. If bank regulators are to do a better job than in the past, [regulation] it needs to be based upon an understanding of how our financial structure becomes susceptible to financial crisis." "Standard economic theory leads to the proposition that markets are equilibrating. It is evident that unbalanced forces exist in the essential financing practices of a capitalist economy. These unbalanced forces center in the financial of positions in capital assets and investment in progress. In time, financial practices lead to an environment in which financial crises can occur." (Minsky, 196_) And this is the theoretical background to the narrow banking proposals: the operation of the private market will produce the financing institutions that ensure both, stability and growth.

What Minsky called "standard" economic theory locates the source of financial instability in the difference between an economy using commodity money, such as gold or silver, and an economy using a money surrogate or substitute without physical existence, denoted as "fiat" money or a fiduciary issue such as "paper money" or deposits, in which the means of payment has no intrinsic value. Since there is no physical limitation on the production of these commodity money substitutes, instability is the result of the divergence of the fiduciary issue from its "real" money backing. This is represented by the ability of banks under fractional reserve systems to "create" money that is a multiple of its money or deposit base. Regulation is thus concerned to provide limitations on the issue of fiat money, to conform to the underlying quantity of physical money. As noted, the proposals for 100% reserve-backing for fiduciary issues is the standard representation of this approach.

Money and Credit: The eternal conundrum

There is a long-standing alternative theoretical tradition amongst banking experts and economists of the cycle, largely forgotten after the empiricism of the monetarist counter revolution, emphasizing the importance of the structure of the financial system in creating the stability of the payments system. This view informed the creation of the Federal Reserve, as well as the New Deal regulations known as Glass-Steagall. It is based on the detailed analysis of the balance sheets of economic agents, and incorporates much of what is now most commonly known as stock-flow consistency. Its differences from the "standard" view is aptly described by Mitchell Innes: (1914:159) "a sale and a purchase is the exchange of a commodity for a credit, and not for a piece of metal or any other tangible property. In that theory lies the essence of the whole science of money." It derives from the recognition that payments settlements, by means of credit entries on balance sheets, were a financial innovation that displaces the use of commodity based monies because of its increased efficiency.

The Balance Sheet – Clearing House Approach to the Credit System

According to Colwell (1859:188-9) "Credit, in no one of its meanings, is the same thing as the credit system; the latter implies the former, but the former does not include the latter. Credit refers chiefly to the confidence which dealers repose in each other, and the consequent postponement of payment upon transactions of sale. (...) The credit system is that by which not only personal confidence exists between parties, inducing them to sell and deliver goods, and defer the payment, but by which the payment is eventually effected, without resort to coin, bullion, or any similar equivalent: it is that by which commodities or services are made to pay for commodities or services: it is a system by which men apply their credits to the extinguishment of their debts. (...) This is in direct contrast with the cash or money system, in which every article is either paid for in the precious metals at the time of delivery, or at some time afterwards. These two systems work side by side." This approach is thus based on the recognition of the independence of the money and credit system, rather than attempts to make them conform.

In contrast to the Quantity theory, it argues that if payments can be effectuated without the presence of physical monetary units, the value of the commodities exchanged cannot be determined by the relation between commodities and the intrinsic value of the means of exchange, but instead are expressed by means of an historically determined unit of account: "the credit system could not exist for a day, but by the aid of a money of account" (ibid., 191) "By the agency of money of account all prices and valuations are fixed, expressed verbally, stated in writing, entered in books of account (...): all values or amounts involved are thus stated and preserved for adjustment or future payment. For every article sold upon time, a debt and a credit of exactly equal amount are created; there is a debtor and a creditor

- the one having to pay the exact sum which the other is to receive. If the debtor can purchase that credit, he becomes both, the debtor and the creditor, and both debt and credit are extinguished, being merged in the same person. The same extinguishment occurs when some third part assumes the place of the debtor, and also purchases the credit; both debt and credit meet in the same person, and are merged. (...) What is thus true of every case of debt and credit(...). is true of the whole class of debtors and creditors." (ibid.192)

To effectuate this, "A class of men is formed, which makes it their business to deal in these securities, or evidences of debt. If a banker or broker purchases the two notes given by the merchant and his customer, it is obvious that both receive the means from him to pay the notes of which he has become holder and owner. The Process of payment between them will be very simple, if the banker merely gives each of the two parties credit on his books for the proceeds of the notes purchased of them. Their respective checks on these credits pay off the whole indebtedness (...)" (ibid.:9)

Colwell thus concludes that "The credit system does not, then really furnish a substitute for money, so much as a model of dispensing with it." (ibid. 193) Indeed, in this point of view the credit system is a financial innovation that creative destructs the use of money by economizing and replacing it as a means of payment in the commercial transactions of the economy: "in all stages of commerce, we find there has been a constant effort to dispense entirely with the use of precious metals." (ibid: 157).

"We have already remarked that the trade or business depending on payments proceeds as if they were made – the making and arranging of payment becoming a separate occupation. That this may be done with more efficiency, the whole indebtedness becomes, in fact, a fund for this purpose. At all times there is a large amount, in the aggregate of debts, incurred for goods sold; but this aggregate, however great, agrees precisely with the amount of credits. (...) when large sums come to be concentrated in the banks, it becomes an efficient manageable fund for the extinction of debts. The whole amount of the credits may, in this way, become available as a medium of payment (...) As all the debts which originate in the credit system are but the counterpart of the credits, the credits become an article of great demand (...) The debtors are, in fact, the holders of the articles of most general consumption; for, that they might be such holders, they contracted the debts. They are, then, not only under stringent necessity of obtaining credits to pay their debts, but have the best means of obtaining them; having for sale, purposely selected, the commodities of daily consumption with the use of which people cannot dispense. The credits, whatever is the shape they take, whether that of negotiable paper, bank-notes, or bank deposits, become a general instrument of purchase, not because they are money, or representatives of money, but because they are the chief medium of paying debts." (ibid. 194-5)

For Colwell "Banks become, in this way, substantially book-keepers for their customers." (ibid, 9) "The books of the banks furnish, thus, a mode of adjustment by which the customers are enabled to apply their credits to the payment of their debts," (ibid.: 10) since "No currency can be more suited to pay a man with than that which he has issued himself." (ibid: 8)

Colwell argues that such a payments system is inherently stable for while "individuals might have trouble, owing to particular circumstance, in meeting payments; but a whole class or body of men could not, unless from other causes, because the fund for payment could never be short, and interest upon credits could never go to a high rate." What are the other causes? Since these are short-term selfliquidating, or even pre-liquidating, positions, there is virtually no chance of being able to extinguish a debt through the acquisition of a credit. Instead, instability in the credit system is the result of the fact that "The blending credits and money, and treating them mainly as identical, have been a fruitful source of error and mischief (...) This fatal policy has been the parent of more commercial revulsions than all other causes combined. (...) Any diversion of credits from the legitimate purpose of paying such debts is hazardous (....) Under our present system of credit, a great amount of credits and securities are annually diverted from their legitimate purposes, and employed as money (...) The great temptation to this diversion of credits arises from the fact that, by our present system, they are required to be convertible at will into gold or silver. Actually, they are not so convertible, and they cannot possibly be, as they amount at all times to a sum from ten to twenty times greater than any possible amount of gold and silver which would be available for such purposes. (...) neither the necessities of business, nor the demands of convenience, require to be convertible on demand (...) This requirement, as it operates, is one of the most mischievous blunders in modern times" (ibid. 197-9).

In Minsky's terms, cash inflows must equal cash outflows in the credit system, and as Colwell notes, could well take place without any interconnection with the use or creation of money as physical means of payment. While there have been various institutional constructs and forms of payment, the concept is easiest to see in terms of a clearing house system. As long as all settlement takes place within the system, there can only be individual divergences between debts and credits, but not for the system as a whole. The divergences can be handled by means of internal clearing house credits, as was indeed the case in the United States before the creation of the Federal Reserve. The difficulty for the credit system

arises when financial system institutions are required to redeem their liabilities for a credit created outside the system, which leads to the possibility of temporal disruption in the natural identity of debts and credits, and the need for financial institutions to hold external physical means of payment as reserves.

Thus, the credit system based on the clearing house principle is stable in that debts and credit always balance, while a credit system with sight liabilities issued to make payments is inherently unstable, since it requires institutions to hold reserves of money; it is only stable if banks hold 100 per cent reserves in money assets. But this means there is no creation of credit, and no accommodation of the production of output by the business sector. The source of the problem for Colwell is thus the confusion of bank liabilities, as a means of term settlement with sight means of payment through physical assets. Thus, where the standard theory sees an excessive multiple expansion of credit based on physical commodity money or reserves, this approach sees an inappropriate use of credit. The regulatory implications are also diametrically opposed. Instead of making credit conform to money, debts should not be payable on demand as money.

A similar explication of the credit system is given by Mitchell Innes (1914:152), referred to above, "Shortly, the Credit Theory is this: that a sale and purchase is the exchange of a commodity for a credit. From this main theory springs the sub-theory that the value of credit or money does not depend on the value of any metal or metals, but on the right which the creditor acquires to 'payment,' that is to say, to satisfaction for the credit, and on the obligation of the debtor to 'pay' his debt, and conversely on the right of the debtor to release himself from his debt by the tender of an equivalent debt owed by the creditor, and the obligation of the creditor to accept this tender in satisfaction of this credit. Such is the fundamental theory, but in practice, it is not necessary for a debtor to acquire credits on the

same persons to whom he is debtor. We are all both buyers and sellers, so that we are all at the same time both debtors and creditors of each other, and by the wonderfully efficient machinery of the banks to which we sell our credits, and which thus become the clearing houses of commerce, the debts and credits of the whole community are centralized and set off against each other. In practice, therefore, any good credit will pay any debt. Again, in theory we create a debt every time we buy and acquire a credit every time we sell, but in practice this theory is also modified, at least in advanced commercial communities. When we are successful in business, we accumulate credits on a banker and we can then buy without creating new debts, by merely transferring to our sellers part of our accumulated credits. Or again, if we have no accumulated credits at the moment when we wish to make a purchase, we can, instead of becoming the debtors of the person from whom we buy, arrange with our bankers to 'borrow' a credit on his books, and can transfer this borrowed credit to our seller, on undertaking to hand over to the banker the same amount of credit (or something over) which we acquire when we, in our turn, become sellers."

Mitchell summarizes his approach as follows: "A credit cancels a debt; this is the primitive law of commerce. By sale a credit is acquired, by purchase a debt is created. Purchases, therefore, are paid for by sales. The object of commerce is the acquisition of credits. A banker is one who centralizes the debts of mankind and cancels them against one another. Banks are the clearing house of commerce. (...) The value of credit does not depend on the existence of gold behind it, but on the solvency of the debtor." (Ibid: 168)

A similar view of the operation credit system was present in the creation of the US Federal Reserve, based on the so-called "real bills" doctrine supported by H. Parker Willis, a Professor of Banking who served as executive director of the National Monetary

Commission and an influential adviser to Carter Glass, who drafted the proposals for, and was the first Secretary of the US Federal Reserve System. In satisfying the need for a more elastic currency to avoid financial instability similar to the 1907 banking crisis, banks were viewed as the central clearing house, with the creation of deposit credits limited to self-liquidating commercial loans. The imposition by the Fed of the par clearance of checks on deposits ensured that all credits were available to meet liabilities. "The function of banking (...) appears as the largest factor in carrying on the actual exchange work (...) of business (...) It appears not as a means of 'lending money,' but rather as a means of 'creating' or providing it." (Willis, et. al: 46) "[I]n the usual instance, the bank merely lends to [the borrower], agreeing to honor his draft or check, in which case it simply marks up on its books the amount of the loan. It stands ready to meet this obligation in any form in which the borrower may call for it, but it expects to be able to pay, in the majority of cases, by offsetting the check to be drawn by the borrower by another that it expects to be deposited with it." (ibid., 52)

As in Colwell[147], the explanation of instability was created by "Banks which create liabilities against credit which does not exist, this type of credit being known as illiquid credit." "Loans to investors to purchase securities in order to resell them at a profit are probably the most illiquid loans, for repayment depends upon the existence at some future time of more than the present number of investors, anxious to purchase the securities out of income than out of the proceeds of new bank loans. If these investors are certain to exist in the future, why do they not exist in the present? Banks frequently make such loans with the knowledge that they can be liquidated only from the proceeds of new loans, either to the original security purchases of those to whom he sells. In such cases, they are acting single handed, expecting to maintain their own liquidity at the expense of the liquidity of less cautious banks." (Whitney: 186) This led to the erroneous principle of "shiftability as the basis for liquidity" which "assumes that any loans are as safe as liquid loans, if they can be shifted to other banks. The principle is safe as applied to an individual bank, provided other banks are willing to take over the shiftable loans, but not to banks as a whole." (ibid. 187) Innes (1910)

had already noted that the US financial system was excessively dependent on lending against securities traded on the stock exchange.

But, as the Federal Reserve moved away from this credit principle, it came under increasing criticism from Willis' students: "The automatic elasticity provided for in the Federal Reserve Act, as originally enacted into law, is present in a system which recognizes only commercial credit. Willingness of the Reserve banks to advance funds by other means than the rediscount or purchase of commercial credit instruments has left the ultimate determination of who shall be entitled to bank deposits by borrowing in the hands of the member banks. Consequently, the automatic action of the elasticity provided for in the Federal Reserve Act disappeared." (ibid: 216) For this reason Willis and his students joined Franklin Roosevelt in arguing against deposit insurance, as the form of insuring a safe payments system: "No plan of protection has had much success" and "the wise selection of credit risks is, after all, the ultimate source of safety - far transcending in its effects and importance any system of artificial protection, designed to take care of the interest of the depositor." Willis, et. al, (1934:66-7) Instead of insurance the recommendation was either direct supervision of composition of bank assets to prevent acquisition of illiquid loans, and thus provide for the "enforcement of safety for the deposits of banks." "Under a policy of commercial banking, instead of investment banking as at present practiced, banks would be smaller institutions than at present. The volume of bank deposits would be curtailed, but the active parts would remain. The inactive part of bank deposits [that is created by "illiquid" loans for hoarding or speculation] would seek an outlet in outside investment markets, where it could be converted into purchasing power until other investors are willing to purchase the underlying securities." (Whitney, op. cit.: 217)

The same view of the operation of the credit system is reflected in Minsky's description of the financial system: "Banking is not money lending; to lend, a money lender must have money. The fundamental banking activity is accepting, that is, guaranteeing that some party is creditworthy. A bank, by accepting a debt instrument, agrees to make specified payments if the debtor will not or cannot. Such an accepted or endorsed note can then be sold in the open market. A bank loan is equivalent to a bank's buying a note that it has accepted." (1986: 258) But, for this system to function, it requires that the bank debtors have access to bank deposits to liquidate the loan. Thus: "In our system payments banks make for customers become deposits, usually at some other bank. If the payments for a customer were made because of a loan agreement, the customer now owes the bank money; he now has to operate in the economy or in financial markets so that he is able to fulfill his obligations to the bank at the due dates. Demand deposits have exchange value because a multitude of debtors to banks have outstanding debts that call for the payment of demand deposits to banks. These debtors will work and sell goods or financial instruments to get demand deposits. The exchange value of deposits is determined by the demands of debtors for deposits needed to fulfill their commitments. Bank loans, while ostensibly money-today for money-later contracts, are really an exchange of debits from a bank's books today for credits to a bank's books later (ibid. 258).

Despite financial innovation in the provision of the clearing of credits and debts, "As the 21st century approaches, the only reason why banks are special is that they operate the "ultimate" payment system within economies (the proximate payment mechanism is now often a credit card). There are now alternatives to banks for all but the provision of the ultimate payment mechanism function. Because banks operate the ultimate payments mechanism, those liabilities of banks which serve as the "medium of exchange" also serve as the standard in which domestic public and private debts are denominated." (Minsky, 1995).

The Banking Principle, the Balance Sheet, the Clearing House and Lifting Constraints

It is this approach that Keynes refers to as the "banking principle" in his proposals for an international clearing union, noting that it provides automatic creditor financing of debtor positions. It is also the principle that is recognized by early Austrian trade cycle theorists such as Mises, Hahn, Hayek and Schumpeter, and English cycle theorists, such as Hawtrey, Lavington, Hawtrey and Keynes when both schools note that the existence banks allow investment to take place, independently of private savings.

There is an important corollary of this "credits liquidate debts" approach to financial organization. It applies to all liabilities, whether public or private. As highlighted by Innes (ibid, 168) "The issue of money is not an exclusive privilege of government, but merely one of its functions" (...) "every merchant who pays for a purchase with his bill, and every banker who issues his notes or authorizes drafts to be drawn on him, issues money just as surely as does a government which issues drafts on the Treasury, or which puts its stamp on a piece of metal or a sheet of paper" (ibid: 152). But in the case of government, unlike the implicit aggregate equality of debts and credits, when it uses its debts to make acquisitions, the transaction appears to be a unilateral imposition, requiring public acceptance. But this is not the case, as Innes argues, following Knapp: "Whenever a tax is imposed, each taxpayer becomes responsible for the redemption of a small part of the debt which the government has contracted by its issues of money, whether coins, certificates, notes, drafts on the treasury, or by whatever name this money is called. This debt takes the form of (...) the redemption of government debt by taxation - is the basic law of coinage and of any issue of government 'money' in whatever form." (ibid: 161). This position is recalled in modern post Keynesian theory by Lerner in his 1947 paper on "Money as a Creature of the State:" "The modern state can make anything it chooses generally acceptable as money (...) apart from any connection (...) with gold (...) if the state is willing to accept the proposed money in payment of taxes and other obligations." (Lerner: 313).

The basic credit-debt theory carries over in Minsky's approach: As Minsky notes, anyone can issue a promise to pay, the problem is to get it accepted. Minsky (1970, note 8) answers the question as follows: "For fiat money to be generally acceptable and valuable there must be a set of payments, units must make for which this money will do. Taxes are such payments; thus, fiat money really should not be introduced without a government with taxes and expenditures. Symmetrically, money as a liability of a fractional reserve bank acquires value in the market because there exist units, the debtors to the banks, which have payments to make for which this credit money will be acceptable. The acceptability and value of money depend on the existence of payments denominated in that money: thus, fiat money without a government that taxes and spends, and credit money without debtors under constraint to meet payments commitments are quite meaningless concepts."

It is important to note that modern monetary theorists are simply following this line by noting that just as banks allow investment to diverge from saving, the government issue of currency backed by taxation means that government investment and expenditures in general cannot be limited by government saving in the form of taxation, and/or borrowing from the public. It is odd that while economists have generally accepted that the financial clearing system lifts the constraint on private expenditure, they have much more difficulty with the same argument applied to public expenditure. But, as noted above, the policy responses are very different across those who view credit as a substitute for physical commodity money, or currency, and those who view it as a complement. For the former, policy should remove this power to lift expenditure constraints, while for the latter, policy should control this power to accomplish policy goals, such as growth of employment and output.

Giving 100 % Banking a Look

Minsky reprises this idea in his 1986 book (Minsky: 1986:258, note 10) "In an economy where government debt is a major asset on the books of the deposit-issuing banks, the fact that taxes need to be paid gives value to the money of the economy." The substitution of government debt for commercial credits on bank balance sheets (a move away from what Colwell would have considered a stable credit structure and Willis would have considered an increase in the "frozen" assets) led Minsky to suggest that given "the limited success of deposit insurance in the late 1980s it is worth it considering the 100% money proposal (...) Fundamentally 100% money position holds that two functions of the banking and the financial structure, the supply and processing of instruments used in the payments mechanism and participating in the financing in the capital development of the economy, are separable. The operation of the payments mechanism is now undergoing rapid changes due to the electronic revolutions and the expanding use of credit cards" (1994/5: 5).

In the 100 % banking proposal government debt goes from being the "major asset" to being the only asset on banks' balance sheets!

Since government debt can always be redeemed for government liabilities, which households will demand to meet taxes, the sight deposit liabilities issued by the banks become a surrogate for government securities and should be just as risk free. Thus, 100 % banking could provide a safe and secure payments system, it implies that the government would be supporting a secure private payments system that it could just as easily provide itself.

Indeed, this was implied in any earlier proposal for reform of deposit insurance: "Whenever bank failures are due to idiosyncratic behavior, actuarial estimates of the probability of payoffs are possible... But "a system-wide decline in asset values cannot be contained by a guarantee or bailout of some restricted class of deposits or institutions. If instabilities that can generate large, system-wide losses of output, employment, and asset values are to be contained, more than deposit insurance is needed" (Minsky and Campbell 1987, 255-6). His conclusion was that the government should provide full support for bank liabilities and to set in place a well-funded, institutional structure to fulfill this obligation. (ibid: 253) Again, this is the equivalent to having the government provide the payments system.

A More Detailed Description of 100 % Narrow Banking

Minsky (1995a: 19-20) provided a more detailed proposal via a bank holding company structure containing a narrow bank and a Colwell style clearing house subsidiary for business lending funded by shortterm Certificates of Deposit protected by a government insurance fund for 80 percent of the face value of the liabilities. The government guarantee of deposits would be transferred to its shortterm financing of business, with the deposit certificates carrying a guarantee. The insurance would take the place of reserves against these liabilities to encourage households to hold them rather than the 100 % government backed deposits. Indeed, it is now common governments to engage into public-private encourage to partnerships, to support specific investment projects, with the government carrying contingent liability for returns. Minsky's proposal would provide a similar mechanism that could be used to direct funding towards productive business investments rather than financial speculation. In addition, the holding company would have another subsidiary for investment banking. Insurance subsidiaries can carry out the underwriting and sales of insurance products. The merchant banking operation will be financed by own capital, as well as commercial paper and certificates of deposit. Because of the high risk, these activities will be financed to a larger extent than the other functions by capital: special liabilities of this subsidiary may well carry some equity kicker. The creation of large denomination "participation deposits" to finance merchant banking activities which carries some of the pains, even as it shares in the gains from merchant banking activities.

The most important implication of this proposal, as Minsky seems to have admitted, was that it bowed to the master of safe payments at the expense of the financing of risky investment (see Kregel2014). This is because in such a segregated system, there would be neither a deposit–credit multiplier, nor leverage, nor private creation of liquidity which was at the heart of the Schumpeterian innovation process and the benefits of creative destruction. Indeed, as Fisher had noted in his original proposal, "new loan funds would come out of savings, but no longer out of thin air" (Fisher, 1935: 91). He pointed out that this would not mean that financing would cease, only that it would be limited to the rollover or repayment of existing credits. In essence, the approach would institutionalize the "loanable funds", theory in which saving determines investment. A similar observation was made by Neil Wallace, who characterized "the narrow banking proposal as one requiring the banking system to be liquid without any reliance on liabilities subordinate to deposits," and concluded that this implied that "the narrow banking proposal eliminates the banking system" (Wallace 1996, 7–8).

These narrow bank proposals would thus require a credit system to provide "substitute for bank lending" in a capitalist system, since they eliminate the creation of liquidity normally associated with the role of the banking system in accepting the illiquid liabilities of the business sector used for financing day-to-day operations. The question is whether the capitalist system could function on this basis (Kregel 2012).

In simple terms, the 100 % narrow bank proposals seek to take away the power of the banking system to lift the constraint on private expenditure, imposing the constraint of private investment. But the analysis of government expenditure, as a corollary suggested above, provides an indication of how additional liquidity could be created to provide increased financing for business investment in a narrow bank world. If the government financed investment expenditure via a fiscal deficit, then the constraint on spending would be lifted. The bonds issued to cover the deficit would be deposited in the narrow bank subsidiary against credits that could be transferred to private individuals in payment for goods and services, or to purchase certificates of deposit or securitized assets, providing for an increase in available investment financing. Instead of being governed by the decisions of banks to extend credit, or the private sector to increase saving, investment finance would then be determined by the position of the government budget and the direction of investment as determined by the extent of the insurance of the liabilities of different types of investment funds. Indeed, such a government policy would be necessary, for in its absence the inherently deflationary tendency would create an additional financial instability.

How to Preserve Policy in a Narrow Bank System

Alternatively, the central bank could engage into the direct financing of public or private sector investment expenditures. The stability of the financial system would then be buttressed by the application of what Abba Lerner called "functional finance." The size of the deficit creating the additional government means of payment required for financing investment exceeding past saving, and allows for positive growth. In the absence of a government sector deficit to support incomes. liabilities used to finance investment could not be validated in a narrow bank holding company structure. But, even more important, it would be impossible in such a system for banks to act as the Schumpeterian handmaiden to innovation, and creative destruction by providing entrepreneurs the purchasing power necessary for them to appropriate the assets required for their innovative investments. In the absence of private sector "liquidity" creation, the central bank would have to provide financing for private sector investment trust liabilities, or a national development bank could finance innovation through the issue of debt monetized by the central bank. Were Minsky alive today, he would probably agree that the current institutional and political structures are not equipped to recognize the role of fiscal deficits in the successful operation of a narrow banking system intended to obviate the need for financial regulation.

Given that Thus much as Colwell had indicated that the money and credit system could be considered as separable, but with government liabilities replacing physical commodity money. In his reflections on reform of the US financing system in the 1980s and 1990s, Minsky noted the affinity of this result to the 100 per cent reserve narrow bank proposals.

The alternative understanding of the operation of the credit system presented above thus allows a diverse solution to Minsky's contradiction. Limiting the banking system to commercial and transaction credits via a clearing system provides the counter proposal to the narrow bank proposal, but without the constraint of savings on the expansion of liquidity to finance investment. As Minsky noted, new communications technology offers the possibility of creating an electronic clearing house, whether via electronic payment cards, or smart phone payment/transfer applications that would eliminate the need for sight conversion, whether the clearing is operated by the private sector or by the government through a national gyro system of payments. This would provide the safe and secure means of payment and secure investment of savings.

This leaves the other master, the financing of risky investment. Since the issue of government debt as means of payment is not limited by any financing constraint, but is validated at any chosen level by the imposition of taxation, it is the government provision of means of payment that should provide the financing of investment independent of private saving. Since in a modern monetary system government created liabilities that serve as means of payment, as opposed to credit, in Innes' conception of government credit, can always be created to offset an imbalance in the private system of credit.

Thus, the alternative to the narrow banking proposals put forward by the Chicago School, and more recently would be to accept the Willis School "qualitative limitation" of bank assets (see Dunkman, 1933) to preserve liquidity, without the necessity of using government debt or gold for bank reserves. This would provide stability in the organization of commercial transactions. The financing of investment would be maintained by means of government financing in private investment banking institutions, a proposal very close to Keynes's idea of the "socialization" of investment. This would be achieved by means of government budgets being divided into balanced current accounts and capital account deficits, to produce the funding required to achieve the desired rate of aggregate investment, to produce the desired rate of growth, or for expenditures on employer of last resort programs, to produce the desired level of employment.

In this way, the financial structure would be designed in order to induce financial stability, and regulation would primarily involve the qualitative assessment of commercial bank assets. This would imply a public-private division of labor in the design of the financial system. Private banks would provide for the provision of credit to finance short-term transaction and production level financing. This would allow the provision of the safe and secure payments system and secure savings outlets. Private commercial banks would be excluded from financing longer-term capital investments which would be undertaken by a government institution funded by the government capital account budget deficit. It would not borrow private savings from the capital markets, so that the losses that are the natural result of the financing of innovative productive investment would be borne by the collective, not by individual financial institutions, or by private individual holding means of payment issued by those institutions as under the present system. The private sector would maintain the control over the selection and financing of innovative, but risky capital investment projects, but the losses would be covered by the government (which is not different from current practice, but now the collective would get both, the benefit and the loss).

Are we going in the Right Direction to Create a Financial Structure that Serves the Two
Masters?

It is clear that the US financial system, especially after the introduction of the Financial Services Modernization Act, has moved in the wrong direction in allowing the comingling of these two different aspects of credit provision, and indeed in having provided an incentive to the creation of "illiquid" assets backed by means of payment. Dodd-Frank legislation has implicitly accepted this financing structure, but seeks to provide limits on the activities that have led to instability in the past.

On the other hand, developing countries, who have been encouraged to adopt the US model would do well to investigate the alternative approach to stability via the design of their domestic financial structure. Among emergent market economies, Brazil seems to have, either by design or by chance, stumbled on the ideal financial structure in support of financial stability. A private sector composed of financial institutions primarily limited to a Colwell type intermediation of debts and credits, and a government investment bank, independent of private financial market borrowing, with government financial support to carry out the risky financing of the productive structure. This provides a solution to the Minsky conundrum of providing a safe and secure financial system of payments and household savings, while at the same time being able to finance risky productive investment and absorb losses without compromising the domestic payment system.

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NOTES

Robey, an assistant professor of banking at Columbia under Willis, was a co-author of a money and banking text with Willis and Chapman (1934) and author of a summary (1938) of Colwell's book.