

Capital Account and Foreign Exchange Derivatives Regulation in Brazil: The Recent Experience

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Abstract: Brazil was one of the emerging countries that had a stronger trend of currency appreciation until February 2012. Under this context that can be understood the recent implementation of the capital account regulations (CAR), which has been complemented with other kind of regulation - FX derivatives regulation (FXDR). The paper shows that only when Brazilian government adopted all of the three kinds of techniques simultaneously (capital controls, prudential financial regulation and FX derivatives regulation), the policy effectiveness increased in terms of protecting the exchange rate from upward pressures. Brazilian experience also shows that it is not possible to establish a clear cut triple hierarchy between instruments to manage capital flows as supported by the current IMF new institutional.

Resumo: Brasil é um dos países emergentes que teve uma das mais fortes tendências de apreciação cambial até fevereiro de 2012. É neste contexto que pode ser entendido a recente implementação de regulações de conta capital, que tem sido complementado por outro tipo de regulação – regulação sobre derivativos cambiais. Este artigo mostra que somente quando o governo brasileiro adotou todos os três tipos de técnicas simultaneamente (controle de capitais, regulação financeira prudencial e regulação sobre derivativos cambiais), a política adotada se tornou efetiva em termos de proteger a taxa de câmbio de pressões para cima. A experiência brasileira mostra também que não é possível estabelecer uma clara tripla hierarquia entre os instrumentos para gerenciar os fluxos de capitais, tal como defendido pela presente visão institucional do FMI.

Área de Submissão: 5.2. Economia e Finanças Internacionais / Sessão ordinária

1 Introduction

Since the 2nd quarter of 2009 there is a new wave of capital flows to emerging economies (which lost breath since the second half of 2011 due to the worsening of the euro crisis and the double-dip threat), due to Federal Reserve's quantitative easing policy, historical low interest rates in advanced countries and the double-speed recovery, with better prospects for economic growth in these economies (Akyuz, 2011; Canuto and Giugale, 2010; Canuto and Leipziger, 2012). Once more, "emerging-market assets" became objects of desire on the part of global investors, resuming policy dilemmas to emerging countries stemming from the combination of high growth rates, accelerating inflation (associated with the new commodity prices boom), excessive currency appreciation and/or asset price overshooting (Prates, 2011).

In order to deal with these policy dilemmas, some emerging countries have resorted to capital account regulation - CCR (capital controls and prudential financial regulation measures) to halt the trend of currency appreciation and to reduce the risks of

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speculative bubbles in asset prices. CCR, during the boom periods, can help authorities to manage economic policy by avoiding exchange rate appreciation, the risks associated with rising current account deficits and useless foreign exchange reserve accumulation. Thus, unlike the pre-crisis context, these countries (even those with current account deficits) are now unwilling to adopt a hands-off approach to capital inflows.

Brazil was one of the emerging countries that had a stronger trend of currency appreciation until February 2012, due to the combination of huge capital inflows, the commodity price boom, high domestic interest rate, and the existence of a sophisticated and deep Foreign Exchange (FX) derivatives market completely open to foreign investors that provides room for speculation on the exchange rate through operations with FX derivatives (the so-called derivatives carry-trade). Under this context that can be understood the recent implementation of the capital account regulations (CAR), which has been complemented with other kind of regulation, called here FX Derivatives regulation (FXDR), whose target is FX derivatives operations of all agents, being them non-residents and residents, and financial and non-financial firms. Regulation of FX derivatives market is outside the scope of typical CAR due to some specificity this market in Brazil, as we will see in this paper.

This paper aims at analyzing the recent experience of capital account regulations (CAR) and foreign exchange derivatives regulation (FXDR) in Brazil taking into account its relationship with Brazil's commitments in financial services in Trade and Investment Treaties, and also its connection with the macroeconomic environment. Besides this introduction, the paper is divided in four sections. Section 2 focuses on the discussion between international financial integration, capital flows and capital account regulation in emerging economies. The third section provides a brief view of capital flows and capital account liberalization in Brazil. Section 4 details the specificity of the Brazilian experience and the key features of CAR and FXDR after the global financial crisis. Some lessons from the Brazilian experience are presented in the final section.

2 International financial integration, capital flows and capital account regulation in emerging economies

2.1 International financial integration, economic performance and macroeconomic instability

Prasad et al (2003) sum up the conventional view that gives support to international financial integration, pointing out that the potential benefits of financial liberalization for emerging market countries can be divided in two channels: direct and indirect. Direct channels include augmentation of domestic savings¹, reduction in the cost of capital due to better global allocation of risk, reduction of consumption volatility, transfer of technological and managerial know-how, and stimulation of domestic financial sector development. Indirect channels include promotion of specialization, commitment to better economic policies, and signaling the practice of more friendly policies. Therefore, according to this view financial liberalization results in market discipline that shall stimulate more consistent macroeconomic policy (understood as sound fiscal and monetary policies, guarantee of rights propriety etc.) as market force (rational foreign investors) can penalize bad policies.

A lot of empirical works, most of them using panel data and measuring the international financial integration with the use of different de jure and de facto indexes, seek to evaluate the relationship between capital account liberalization, on one hand, and economic growth, financial crises and/or macroeconomic volatility, on the other hand. Some surveys conclude that empirical evidences in general do not present a robust relationship between financial liberalization and economic growth (Prasad et al, 2003; Einchengreen, 2004, Ch 3). Prasad et al (2003, p.6) resume the empirical findings of the literature as follows: “a systematic examination of the evidence suggests that it is difficult to establish a robust causal relationship between the degree of financial integration and output growth performance”.

Some IMF's economists works have acknowledged the potential risks and costs related to international financial integration and specifically to the volatility of capital flows in emerging economies (Prasad et al, 2003; Kose et al, 2006; IMF, 2008), as the surge of capital inflows can have negative effects on emerging economies, including the appreciation of the domestic currency beyond the equilibrium level, fiscal costs of sterilization related to international reserves accumulation, inflationary pressures can result from incomplete sterilization and/or credit boom, and possible bubbles in certain sectors as equity markets. However, IMF (2008) sustains that financial globalization leads to better macroeconomic outcomes when certain threshold conditions of financial

¹ This augmentation is related to the notion that capital flows from capital-rich countries to the capital-poor countries due to a comparatively higher marginal productivity capital in the former ones.

and institutional developments are met (financial market development, institutional quality, sound macroeconomic policies, trade integration, etc.), but some analysts have argued that such conditions are almost the same factors pointed out as collateral benefits of financial globalization, generating a logical contradiction between consequences and causes (see, for instance, Biancarelli, 2008). In the new “IMF institutional view” on capital account liberalization (IMF, 2012), the institution now recognizes that capital flows carry risks and that the capital account liberalization adopted before the economies reach certain threshold conditions can accentuate those risks.

Yet, since the breakdown of the Bretton Woods system, some prominent mainstream economists have stressed that with the financial liberalization and the emergence and spread of new financial instruments (such as derivatives), the likelihood of occurrence of speculative financial operations increases substantially. Tobin (1978), for instance, states that the main macroeconomic problem related to integrated financial markets is not the choice of the appropriate exchange rate regime but the excessive short-run capital mobility that reduces the autonomy of national governments to pursue domestic objectives with respect to employment, output and inflation. According to Tobin (1978, p.153), “the mobility of financial capital limits viable differences among national interest rates and thus severely restricts the ability of central banks and governments to pursue monetary and fiscal policies appropriate to their internal economies” (p. 154). Stiglitz (2000) states that capital flows in emerging countries are markedly pro-cyclical and exacerbate economic booms, and that financial liberalization exposes countries to the vicissitudes associated with changes in economic circumstances outside the country; so that such economies are exposed to sudden change in lenders’ and investors’ perceptions. Such shifts can increase capital outflows. According to Stiglitz (2000, p. 1080), “capital market liberalization exposes countries to vicissitudes associated with changes in economic circumstances outside the country: a sudden change in lenders’ perceptions concerning ‘emerging market risk’ can lead to huge capital outflows, undermining the viability of the entire financial system”.

Recent empirical studies undertaken by the IMF (2011) and its economists, such as Cardarelli et al. (2009), found some findings that are in line with Stiglitz (2000) and other authors’ analysis on the effects of the capital flows to emerging economies:

a) Volatility of capital flows has increased over time and fluctuations in net flows are much sharper for emerging economies compared with developed economies – in the latter, gross outflows largely offset gross inflows, generating smoother movements in net flows. By contrast, in emerging economies, gross inflows and net flows both fell dramatically during the crisis and rebounded sharply afterward (IMF, 2011, p. 125).

b) Episodes of large capital inflows are associated with acceleration of GDP growth, but afterwards growth often drops significantly: over one third of the completed episodes ended with a sudden stop or a currency crisis, what suggests that abrupt endings are not a rare phenomenon (Cardarelli et al., 2009, p. 5). Thus, there is an inverted V-shaped pattern of net capital flows to emerging economies outside the policymakers control (IMF, 2011).

c) The surge of capital inflows also appears to be associated with a real effective currency appreciation, damaging the competitiveness of export sectors and potentially reducing economic growth (Cardarelli et al., 2009).

d) Historically, portfolio flows have been more volatile and their volatility has recently risen. Bank flows have historically been less volatile but their volatility rises sharply around crisis times. FDI is only slightly more stable than other types of flow for emerging economies, and its volatility has increased recently due to increase of direct borrowing by a firm subsidiary (IMF, 2011).

Exchange rate, under the conditions of capital mobility, is increasingly determined by portfolio decisions of international investors, more related to a short-run view. Portfolio decisions are dependent from the changes in the market sentiment, that is, investors' portfolio expectations (Harvey, 2003). However, exchange rate volatility in general is higher in emerging economies than in developed ones due to the *monetary asymmetry* of the international monetary and financial system, that refers to the hierarchical dimension of the international monetary system. In other words, national currencies are hierarchically positioned according to their degree of liquidity, which relates to their ability to perform internationally the three functions of money: medium of exchange, unit of account and denomination of contracts, and store of value (international reserve currency). The key currency (currently, the fiduciary US dollar) is placed at the top of the hierarchy because it has the highest degree of liquidity. The currencies issued by the other core countries are in intermediate position, as they have a

high liquidity premium, but not as high as the dollar. At the opposite end are the currencies issued by the emerging economies, which are non-liquid currencies, for they are incapable of performing those functions. Consequently, these currencies, priced with a lower liquidity premium, are especially vulnerable to the inherent volatility of capital flows in the post-Bretton Woods system. The smaller and less liquid foreign exchange and financial markets of emerging economies make them more vulnerable to one-way expectations and herd behavior (Andrade and Prates, 2013). Countries with high debts, currency mismatches and/or fragile financial sector are particularly vulnerable (Moreno, 2005).

2.2 Policy space and capital account regulation

In order to enhance the possibility of a successful management of exchange rate regime in emerging economies some measures to reduce the volatility of capital flows and the likelihood of speculation attack on domestic currency can be necessary. One possibility is the use of official intervention in the foreign exchange market, which may exert direct influence on nominal exchange rate as it alters the relative supply of domestic and foreign currencies. On the one hand, the countries' ability to resist currency depreciation is limited by its stock of foreign exchange reserves and its access to potential credit lines. Thus, reserve accumulation can be seen as an insurance against future negative shocks and speculation against the domestic currency, as emerging economies have limited access to the international capital market during times of high risk aversion of foreign investors. On the other hand, the ability to avoid currency appreciation may require the use of sterilized intervention. Monetary authorities have often sought to sterilize the impact of foreign exchange intervention through open market operations and other measures, such as increasing bank reserve requirements. Moreover, sterilization often implies quasi-fiscal costs, as it in general involves the central bank exchanging high-yield domestic assets for low-yield foreign reserves (Cardarelli et al., 2009).

Another possibility to enhance the management of the exchange rate regime (that is not excluding official intervention in the currency markets) in emerging economies is the use of "capital account regulation" (Gallagher et al, 2012) or "capital management techniques" which include capital controls, that is measures that manage volume, composition, and/or allocation of international private capital flows, and/or

‘prudential domestic financial regulations’, which refer to policies, such as capital-adequacy standards, reporting requirements, or restrictions on the ability and terms under which domestic financial institutions can provide to certain types of projects (Epstein et al., 2003, p.6-7). Capital controls can be used for different though related objectives, such as: (i) to reduce the vulnerability of a country to financial crises, including capital flight during currency crisis; (ii) to drive a wedge between onshore and offshore interest rates in order to provide monetary authorities with some policy autonomy at least in the short-run; and (iii) to maintain some short-term stability of nominal exchange rate and to reduce exchange rate pressures derived from excessive capital inflows.

Magud and Reinhart (2006) reviewed more than 30 papers that evaluated capital controls either on inflows or outflows around the world (the evaluation excludes countries with comprehensive capital controls, such as China and India), making use of a capital controls effectiveness index in order to standardize the results of the empirical studies. They conclude that “capital controls on inflows seem to make monetary policy more independent; alter the composition of capital flow; reduce real exchange rate pressures (although the evidence is more controversial)”, but “seem not to reduce the volume of net flows (and hence, the current account balance)”, while “limiting private external borrowing in the ‘good times’ plays an important prudential role because more often than not countries that are ‘debt intolerant’” (p.26-27). Finally, Magud and Reinhart (2006) argue that enhancing the effectiveness of capital controls is necessary to take into account country-specific characteristics in their design.

To sum up, set against the adoption of conventional economic policies is the perceived need to preserve the autonomy of developing countries’ exchange rate, fiscal and monetary policies. This has reinforced the opinion of some economists and policymakers of the necessity of introducing capital controls and an exchange rate regime that prevents exchange rate fluctuations.

Concerned with the amount and volatility of capital flows to emerging economies after the contagious of the 2008 crisis, IMF revised its official position towards capital controls, that now can be considered as a ‘measure of last resort’, when all other macroeconomic policies and regulatory measures are exhausted: “We argue that if the economy is operating near potential if reserves are adequate, if the exchange rate is not undervalued, and if the flows are likely to be transitory, then controls on

capital inflows – together with macroeconomic policy adjustment and prudential measures – may usefully form part of the policy toolkit” (Ostry et al, 2010, p. 562, *italics added*). In this connection, “controls are part of the toolkit when certain macroeconomic conditions are satisfied, and when non-discriminatory prudential tools will not have traction in addressing the financial-stability risks” (Ostry et al, 2011, p.9). Therefore, the authors seek to establish a triple hierarchy between the instruments to manage capital inflows: macroeconomic policies should be first applied (building up foreign reserves, letting currencies appreciate, and cutting budget deficits in order to reduce that amount of capital flows to emerging markets); then prudential regulations on the domestic banking sector that affect cross-border flows that are intermediated by domestic financial institutions should be implemented; finally, when prudential tools were insufficient or could not be made effective in a timely manner, proper capital controls, defined as measures that restrict capital transactions between residents and non-residents, could be applied as transitory measure of last resort. So, the management of capital inflows should not be used as a substitute of the sound macroeconomic policies and the necessary reforms².

Some authors have criticized the IMF new “institutional view” as insufficient to deal with some emerging economies macroeconomic issues (Fritz and Prates, 2012; Gallagher et al, 2012; see also Gallagher, 2012). First, they argue that by defining capital controls as temporary and a measure of last resort this approach poses serious limits to the policy space that is required to emerging countries. Gallagher et al (2012, p.6), for instance, argue that “capital account regulations” (CAR) should not be seen as measures of last resort, but as permanent part the policy toolkit to be used in a counter-cyclical way to smooth booms and busts, and to increase the policy space to exert control over the key macroeconomic prices such as the exchange rate and interest rate. CAR are integral part of the macroeconomic policy, as they can help economic authorities to face and eventually solve some macroeconomic trade-offs, as it is the case of a situation in which central bank under an environment of capital flows surge wants for some reason to increase the interest rate and at the same time wants to avoid a

² According to IMF (2012b, p.1-2, *italics added*), “For countries that have to manage the macroeconomic and financial stability risks associated with inflow surges or disruptive outflows, a key role needs to be played by macroeconomic policies, including monetary, fiscal, and exchange rate management, as well as by sound financial supervision and regulation and strong institutions. In certain circumstances, capital flow management measures can be useful. *They should not, however, substitute for warranted macroeconomic adjustment*”.

further exchange rate appreciation, or, another situation in which central bank wants to intervene in the foreign exchange market in order to affect nominal exchange rate, and at the same time would like to avoid the fiscal costs of sterilization of such operations.

Second, the IMF hierarchy is inappropriate as it seeks to draw lines between macro-prudential measures, measures to influence the exchange rate and capital controls defined in a jurisdictional manner as discrimination against the residency of investors. According to Fritz and Prates (2012, p.9-10), “[a] deeper look at the countries’ experience, however, makes clear that there is a great deal of synergy and overlapping in these measures. There are important feedbacks to be found between capital controls and prudential financial measures, as much as between these measures and macroeconomic policy. For example, instruments of prudential financial regulation (such as limits on banks operations in foreign currency) work in practice as capital controls, while some of these controls (such as taxation of foreign loans) add to reduce systemic financial risks”. As we will see in the section 5 the Brazilian experience shows that is not possible to establish a clear cut triple hierarchy between the instruments to manage capital flows as supported by the IMF approach, as it was only when Brazilian governmental authorities used all kinds of capital account management simultaneously that policy effectiveness increased in terms of protecting the exchange rate from upward pressures.

3 Capital flows and capital account liberalization in Brazil: A brief view

The degree of financial openness of the Brazilian economy is high. This process of liberalization began in the 1990s and was most time incremental, marked by key rules that, given their strong impact on capital inflows and outflows, can be considered as landmarks. This was the case with the approval, in 1991, of Annex IV of Central Bank of Brazil Resolution no. 1,289, permitting foreign institutional investors to participate directly in the Brazilian capital market and, in 1992, the redesign of CC5 accounts, permitting residents and non-residents to make capital transfers abroad from Brazil. So, both capital inflows and capital outflows were liberalized in Brazil. The process of financial opening gained momentum in January 2000, when the Resolution CMN no. 2,689 allowed the unrestricted access of non-resident (i.e. foreign) investors to all the segments of the domestic financial market, including the derivatives market.

Afterwards, during the 2000s there was in course a process of consolidation of the foreign exchange rules (Paula, 2011).

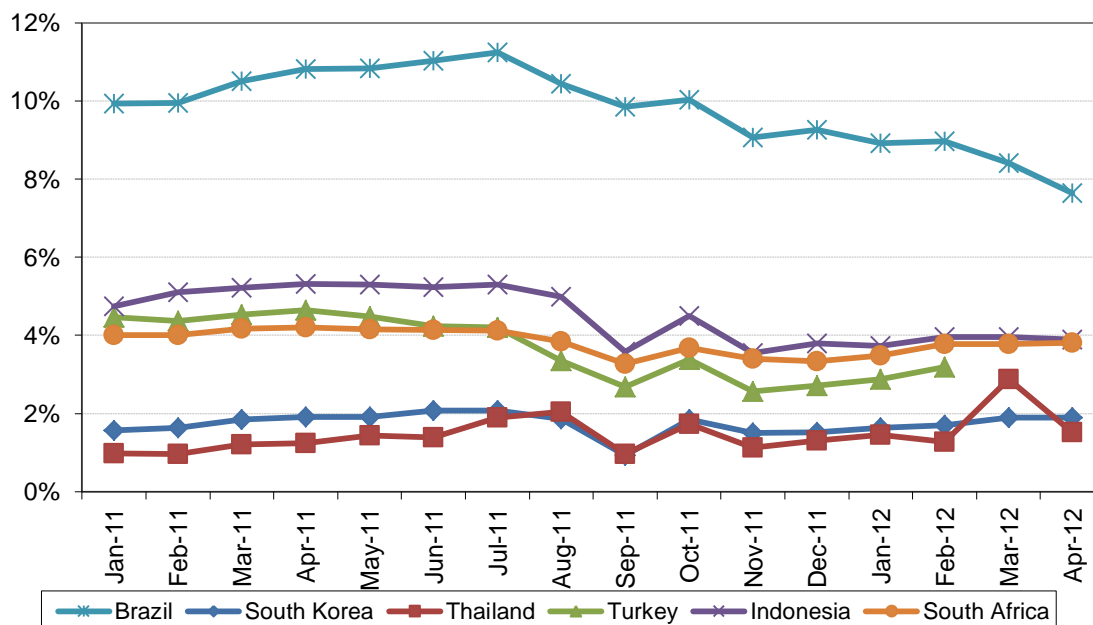
Despite of the process of capital account liberalization in Brazil, domestic norms on foreign exchange transactions allow the implementation of capital controls at any time – there is no formal restriction on this concern. Law 4,321/1961, which allows the adoption of controls on capital outflows by foreign investors and transnational enterprises, has not been repealed. However, there are some limits to the efficacy of CCR due to two specificities of the Brazilian economy.

The first one is the high degree of financial openness of the Brazilian economy. The country had an ample and deep experience of external financial liberalization. Although Brazil adopted a more gradual style of Washington Consensus policies compared other Latin American countries, capital account liberalization was relatively fast and widespread. This liberalization began in the 1990s and was most time incremental, marked by key rules that, given their strong impact on capital inflows and outflows, can be considered as landmarks. This was the case with the approval, in 1991, of Annex IV of Central Bank of Brazil Resolution no. 1,289, permitting foreign institutional investors to participate directly in the Brazilian capital market and, in 1992, the redesign of CC5 accounts, permitting residents and non-residents to make capital transfers abroad from Brazil. So, both capital inflows and capital outflows were liberalized in Brazil. The process of financial opening up gained momentum in January 2000, when the Resolution CMN no. 2,689 allowed the unrestricted access of non-resident (i.e. foreign) investors to all the segments of the domestic financial market, including the derivatives market. Afterwards, during the 2000s there was in course a process of consolidation of the foreign exchange rules³.

The second specificity is the huge differential between internal and external interest rates, which attracted dramatically capital inflows, mainly portfolio ones, and stimulated private agents to find loopholes to circumvent the regulations (regulatory arbitrage), as detailed in the next section. Despite the recent reduction in the short term interest rate (Selic) by the BCB, the differential between the internal and external interest rates is still high compared to other emerging countries (see Figure 1).

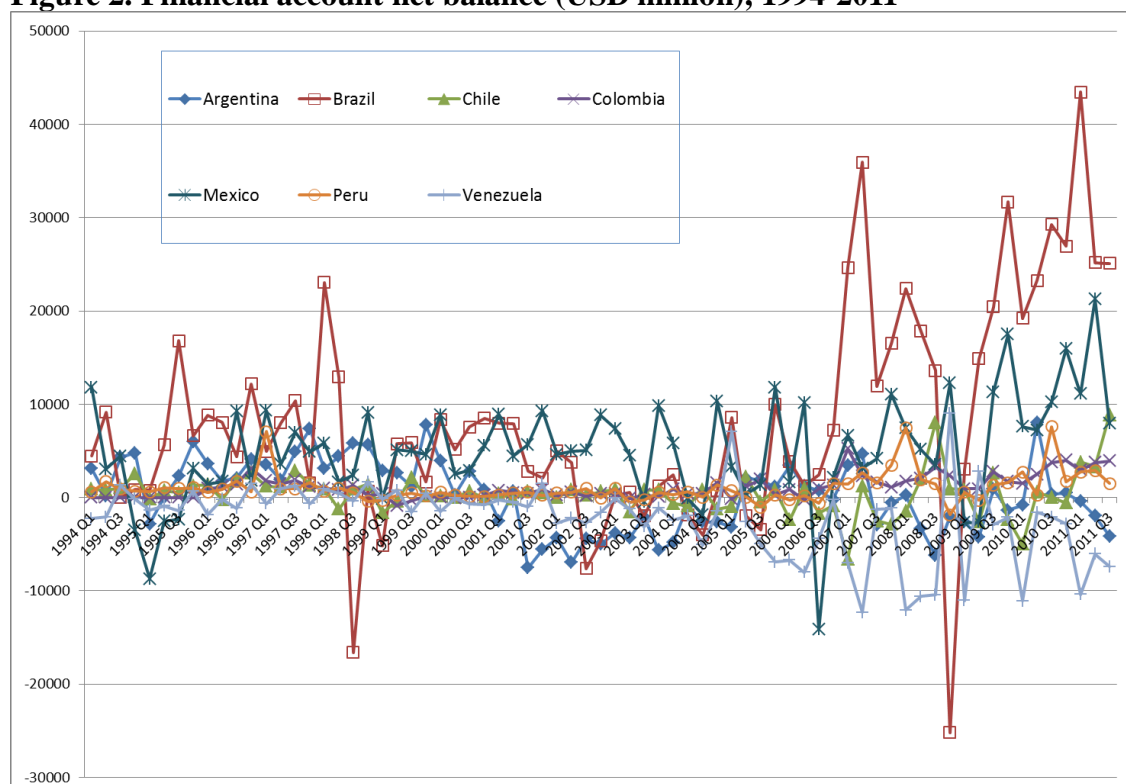
³ The empirical literature does not show clear benefits of capital account liberalization in Brazil in terms of economic performance and macroeconomic stability. In general, they show that financial liberalization had a negative, although limited, net effect on economic growth, and strong and oscillatory effects on interest rate variation and exchange rate variation (van der Laan, 2007; Paula, 2011).

Figure 1. Interest rate differential (%), January 2011-April 2012



Source: Authors' elaboration with data from Central Bank of Brazil.

Figure 2. Financial account net balance (USD million), 1994-2011



Source: IMF (2012a) - International Financial Statistics.

As we can see in the Figure 2, a new surge of capital inflows to Latin America (and also to other emerging economies) started in the middle of 2009, with a quick recovery of capital inflows after the contagious of the global financial crisis. The main drivers behind of this wave are: (i) loosening monetary policy in advanced economies due to the “quantitative easing” policy of the FED, and later of the ECB, widening the interest rate differentials and creating abundant global market liquidity; (ii) better economic performance of the emerging economies and the slow recovery of the developed countries; (iii) sound fiscal and debt position of the emerging economies relative to advance economies; and (iv) quick and continuous recovered of commodity prices until May 2011, when prices started a decline trend.

All these factors, along with improved global risk appetite, have attracted capital inflows, especially portfolio debt capital flows. The current episode is characterized by a predominance of volatile portfolio inflows, much more than previous wave, with a sharp and unprecedented increase in the flows (net flows of more than USD 50 billion in some quarters), followed by the direct investments that have increased in 2011. Note that Brazil had records of capital flows in the recent wave, followed far above by Mexico, Colombia, Peru and Chile⁴. This movement can be attributed to the improvement in the country-risk (Brazil got the degree of “investment grade” in the second quarter of 2008) and the interest rate huge differentials.

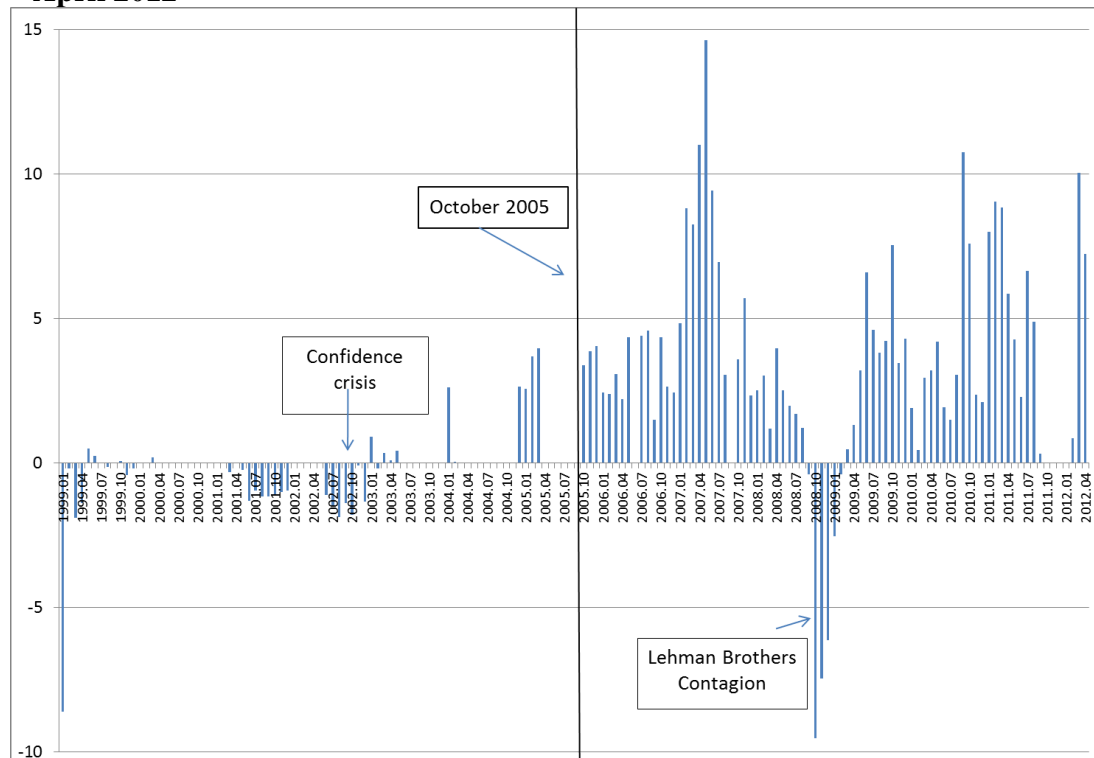
Focusing on the policy response to the abundance of capital inflows to Brazil it is worth to have a look in the management of the exchange rate policy and the implementation of CAR, particularly since 1999 when Brazil adopted a New Consensus Macroeconomics’ style of economic policy. As we will see some flexibility in the operation of NCM policies was introduced along the time, that is during the Lula da Silva’ government (2003-2010) and mainly in Dilma Roussef’s ones (2011-...).

Figure 3 shows the BCB interventions in the foreign exchange market (spot market) since 1999, when Brazil adopted a floating exchange rate regime, where negative values means that it is selling foreign currencies and positive values means that it is buying them. A general outlook shows broadly speaking two distinguish BCB

⁴It should be stressed that since mid-2011 capital flows to Latin America, including Brazil, were affected by the Eurozone crisis that resulted in a sharp increase of the volatility in the international financial market, for which also contributed the uncertainty related to performance of the North-American economy due to the threat of the so-called “fiscal cliff” (IEDI, 2012). Indeed, capital inflows slowed as global market risk aversion deteriorated.

pattern of intervention: (i) from 1999 to September 2005 exchange rate policy was of “free float” type or “no fear of floating” behavior, in which BCB did only eventual and few interventions, mainly in periods of instability in the foreign exchange market (such as during the 2002 confidence crisis), selling dollars in order to avoid further devaluation of the domestic currency; (ii) since October 2005 BCB began to buy foreign currencies in a continuous but uneven way, mainly as part of the international reserves accumulation policy, without having any commitment with a certain level of exchange rate, that continued to have an appreciation trend. Some more aggressive intervention was done eventually in order to reduce greater exchange rate volatility in the sense of appreciation or depreciation. So, there was a more typical dirty floating behavior.

Figure 3. BCB intervention in the foreign exchange market (US\$ billion), Jan. 1994 – April 2012



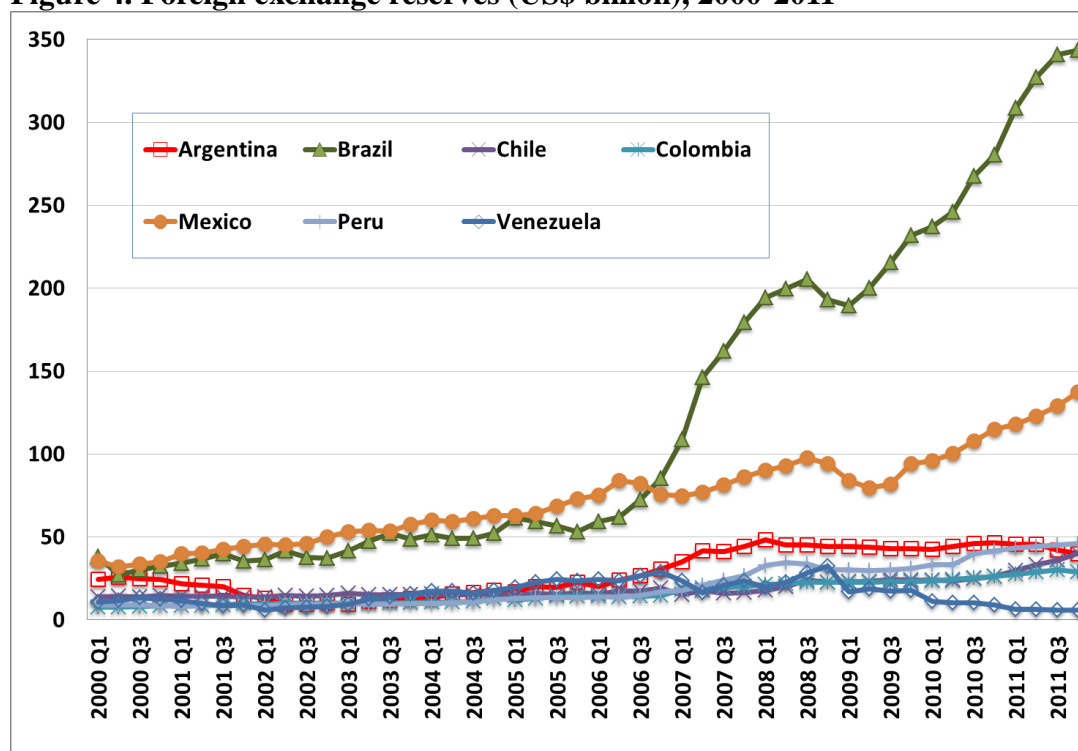
Source: Authors' elaboration with data from Central Bank of Brazil.

Note: (+) purchase (-) selling

Since the 1990s, CCR have been mainly endogenous in Brazil, in the sense that they have been adopted and tightened during periods of boom of capital flows, and have been loosened during periods of capital flight. The exception occurred during Lula da Silva's government when the Brazilian economy faced a capital flows boom in 2005-2008 without adopting CCR (instead BCB accumulated FX reserves with very high

fiscal costs). During the 2000s financial liberalization was integral part of the ‘model’ of economic policy inspired in the New Consensus on Macroeconomics (floating exchange regime, inflation target regime and primary fiscal surplus), which supports that the main focus of the economic policy is price stabilization, inflation is a monetary phenomenon that can only be controlled through changes in the interest rate and that inflation targeting regime is the best arrangement for economic policy. Likely the only important change was the policy of foreign exchange reserves accumulation that aimed at having a cushion of safety against currency speculation and reducing exchange rate volatility. It is worth to mention that Brazil compared to other major Latin American economies did a more aggressive FX reserve accumulation policy (see Figure 4), that however did not avoid the general trend for exchange rate appreciation. This trend was somehow tolerated by BCB as essential to the attainment of the inflation target in Brazil (Arestis et al, 2010).

Figure 4. Foreign exchange reserves (US\$ billion), 2000-2011

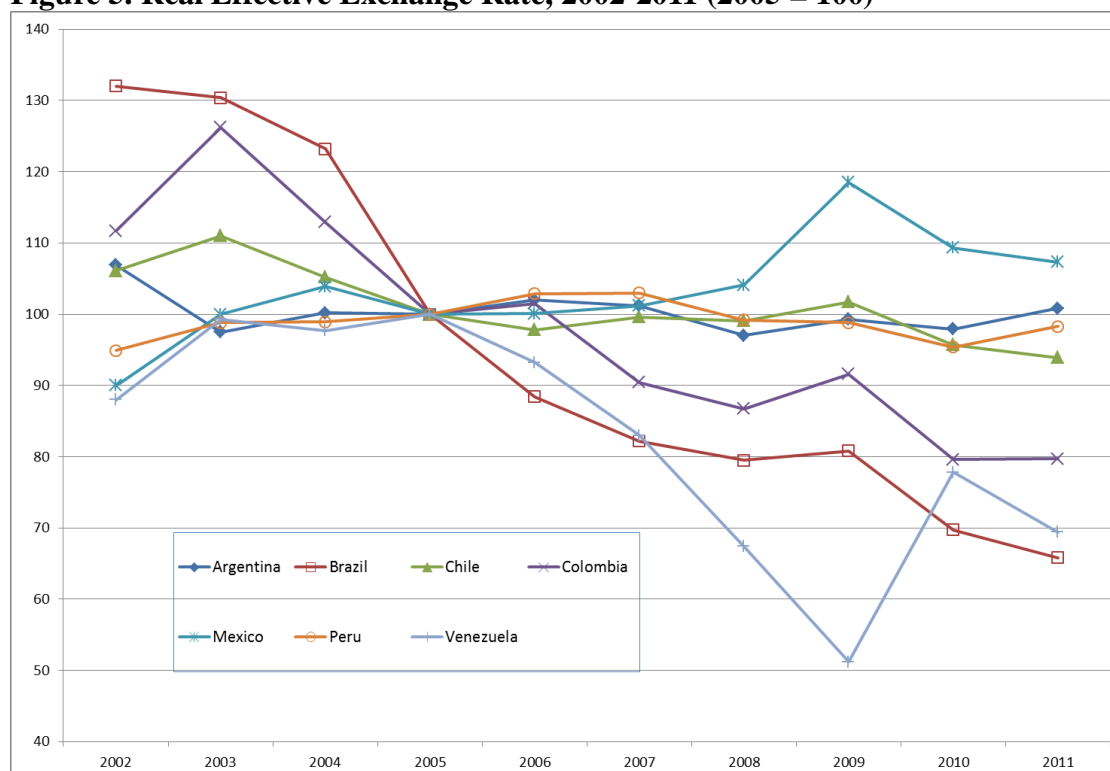


Source: IMF (2012a) - International Financial Statistics.

Indeed, intervention in the currency markets, including accumulation of reserves, has been massive in Argentina, Brazil and Chile and very high in Colombia and Peru (Figure 4). However, for some economies there was a gradual trend of real

appreciation of the domestic currencies due to massive capital inflows. This was the case of Brazil and Colombia that, together with Venezuela, are the countries whose currencies had a strong upward pressure in real terms, which means a downward trend of the real effective exchange rate (as the exchange rate is the price of the USD) (Figure 5). Brazil was one of the emerging countries that had a stronger trend of currency appreciation until February 2012.

Figure 5. Real Effective Exchange Rate, 2002-2011 (2005 = 100)



Source: ECLAC - Data Bases and Statistical Publications.

Note: Annual averages. A country's overall real effective exchange rate index is calculated by weighting its real bilateral exchange rate indices with each of its trading partners by each partner's share in the country's total trade flows in terms of exports and imports. A currency depreciates in real effective terms when this index rises and appreciates when it falls.

In the post-global financial crisis context, CAR has also been predominantly endogenous in Brazil. After implementing some slight capital controls in 2009 and 2010, it was only after January 2011 (when the first prudential financial regulation tool was implemented) and, mainly, after July 2011 (when the Brazilian government adopted a broader regulation of the FX derivatives operations) a more comprehensive regulation has been launched, encompassing both capital controls, prudential financial regulation and FX derivatives market regulation. This change is related to a broader change in the

conduction of economic policy during Dilma Rousseff's government (that began in 2011), that CCR and FXDR is an integral part. On the one hand, BCB adopted a more flexible monetary policy with the use of broader tools of monetary policy, including macro-prudential measures, and since August 2011 began a gradual and continuous reduction in the interest rates (from 12.5% in August 2011 to 8.5% in June 2012) so adopting a more "forward looking" behavior. On the other hand, with the use of CCR and FXDR, Brazilian government seems to be committed in affecting somehow the level of exchange rate, without any formal commitment however, avoiding a greater appreciation caused by the exuberance of the capital flows. There is some flexibility in the operation of NCM policies and a greater coordination in the economic policy (monetary, fiscal and exchange rate policies). However, this does not mean a more radical change in the economic policy as Brazilian government is still committed with the inflation targeting regime.

4 Capital account regulation and FX derivatives regulation

Before detailing CAR and FXDR in Brazil after the global financial crisis, it is important to explain the importance of this last type of regulation in Brazil. This importance is due to the central role of the FX derivatives operations in the trend of the Brazilian currency (BRL) (predominantly an appreciation trend, i.e., a fall of the BRL/USD exchange rate which is the price of USD) as well as to the specificities of the FX derivative market in Brazil. This central role stems from the much higher liquidity and depth of the FX futures market, in comparison with the FX spot market. The predominance of the organized segment in the FX derivatives markets (i.e., futures traded in BM&F Bovespa) is a specificity of Brazil's currency market. According to Avdjiev *et al* (2010), the BRL was the second most traded currency worldwide in the organized derivatives markets in 2010.

A major distinction of the Brazilian FX derivatives (futures and OTC) market is that these operations are non-deliverable. This means that gains or losses in these operations are liquidated in domestic (BRL – Brazilian *real*), and not in foreign currency (USD). Due to their non-deliverable legislation, the margin requirements of FX futures transactions can be fulfilled in BRL. Along with the unrestricted access of non-residents to the FX futures market in the context of financial liberalization, this

specific norm has contributed to its higher liquidity in comparison with the FX spot market as FX futures operations can be carried out without any effective foreign currency flows.

Both before (2003 to mid-2008) and after (since 2009) the global financial crisis, during periods of low risk aversion, foreign institutional investors have become the most important investor group in the FX Futures market, fostering a real appreciation trend through derivative carry trade. This is a different kind of currency speculation strategy, compared to the canonical carry trade through spot market operations - when an investor borrows money in a currency with a low interest rate and uses it to take long positions in currencies backed by high interest rate (Gagnon and Chaboud, 2007). This strategy presents advantages because of their inherent high degree of leverage (as in order to be carried out, financial derivatives operations require only the payment of a margin requirement).

In derivatives markets 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 (Idem, 2007). In the case of Brazil, due to the huge differential between the internal and external interest rates, since 2003 foreign investors have taken, predominantly, one way bets on the Brazilian currency appreciation through short positions in the FX futures market (selling USD dollars and buying BRL), which has resulted in downward pressure on the USD price and, thus, in upward pressure on the BRL price.

FX future and spot markets are linked by the arbitrage carried out mainly by banks as the dealers in the FX spot market. In front of the downward trend of the USD futures price, these agents took the contrary position of foreign investors in the FX futures market (long position in USD and short in BRL). With this strategy, banks have earned arbitrage profits and, at the same time, caused additional appreciation of the Brazilian currency.

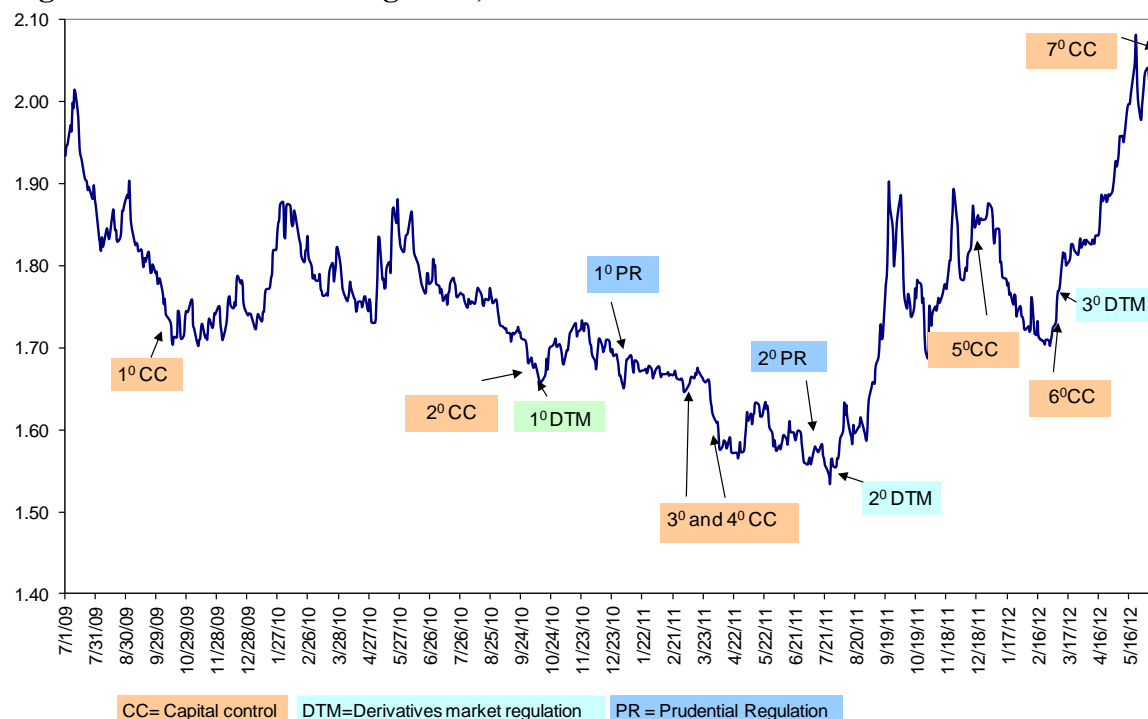
The derivatives carry trade turns out to be even more attractive in Brazil due to the non-deliverable trait of the FX futures market. In the case of Brazil, until October 2010, foreign and domestic agents could engage in derivatives carry trade not even investing on the margin, as usual with derivatives operations, but without disbursing one USD. More than that, 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. Despite the

leadership of foreign investors, profit-seeking domestic agents, such as institutional investors and companies, have also engaged in derivatives carry trade.

Therefore, while other countries only face a problem of low efficacy of capital controls to deal with FX derivatives operations (due to its high degree of leverage), Brazilian authorities are dealing with an even greater challenge, as these operations could simulate the impact of capital flows on the exchange rate without any effective foreign currency flows. Consequently, CAR focused only on foreign capital flows have proven to be ineffective in restraining them, while at the same time prudential financial regulation also is insufficient in this case as it does not reach foreign investors and non-bank resident agents.

The Brazilian regulatory authorities after some time realized this constraint. Since October 2010, they have launched, along with CAR, specific measures to tap these operations, the already mentioned “FX Derivatives Regulation” (thereby FXDR). This new kind of regulation has revealed to be key in restraining the BRL appreciation trend and, in turn, mitigating the economic policy dilemma faced by the Brazilian government, mainly, that is containing inflationary pressures without reinforcing the exchange rate misalignment (Figure 6).

Figure 6. BRL/USD exchange rate, Jan.2009-June 2012



Source: Authors' elaboration with data from Central Bank of Brazil.

In October 2010, a price-based capital control (a financial tax on inflows, called in Portuguese *Imposto de Operações Financeiras*, IOF), already adopted at a low level in 2009, was increased to curb the undesirable effects on financial and macroeconomic stability of one important kind of capital flows outside the scope of prudential financial regulation: portfolio investment in equity and fixed income. Brazilian government a few days later also closed a loophole that allowed foreign investors to avoid the higher tax on fixed income investments established before. Moreover, the first FXDR was implemented: the IOF on margin requirements on FX derivatives transactions was increased from 0.38 per cent to 6 per cent and some loopholes for IOF on margin requirements were closed (Annex 1).

However, the first rounds of CAR and FXDR showed to be insufficient, as the IOF was too low to stem the derivatives carry trade due to its high leverage degree. Moreover, private agents found loopholes to circumvent the regulations (Figure 1). One of the main channels of circumvention after October 2010 was the increase in bank's short dollar positions in the spot currency market. In fact, the IOF on portfolio inflows encouraged the build-up of long real/short dollar positions in the on-shore derivatives market, that is, the derivatives carry trade supported by resident banks.

To close this loophole, the Central Bank of Brazil adopted a non-interest reserve requirement on these positions in January 2011, which is a prudential financial regulation tool. Nevertheless, banks found another channel of regulatory arbitrage by switching to short term foreign borrowings which also allow them to obtain arbitrage gains between the internal and external interest rates. The regulatory response was the IOF on this kind of capital flows adopted in March 2011. However, private agents were able to make longer term loans giving the excess of liquidity and searching for yield in the international financial market. Then, in April the government extended the IOF to these loans. Consequently, until the first semester of 2011, the impact of the CAR was mainly on the composition of inflows rather than on their volume.

Regarding the currency appreciation trend, this could be curbed only after the launch of a broader FXDR in the end of July 2011. At that time, the government imposed a financial tax of 1 per cent on excessive long positions on BRL in the FX derivatives market. These measures at least had a longer lasting effect as they reach not only the marginal requirements, but the notional value of the carry trade operations at

the FX derivatives market. The exchange rate BRL/US\$ increased from 1.70 in 02/28/2012 to 2.00 in 18/05/2012, a nominal devaluation of 17.6% (see Figure 1). An additional reason for such exchange rate behavior is some reduction in the net capital flows to Brazil since mid-2011 due to both the BCB policy determination to reduce short-term interest rate and the increase of risk aversion of foreign investors due to the higher likelihood of the imminence of a euro crisis (see Annex 1).

5 Some lessons from the Brazilian experience

As we have seen in this paper, financial globalization has been often a source of broader instability related to the occurrence of currency crises and speculative attacks, and also of the reduction in the degrees of freedom in the implementation of a more autonomous economic policy. Cyclical capital swings have strong effect on major macroeconomic variables, such as exchange rates, interest rates, domestic credit, and asset prices. In order to enhance the possibility of a successful management of exchange rate regime in emerging economies some measures to reduce the volatility of capital flows and the likelihood of speculation attack on domestic currency are necessary. As we have seen in this paper, one possibility to enhance the management of exchange rate regime in emerging economies is the use of ‘capital management techniques’ that includes capital controls, that is measures that manage volume, composition, and/or allocation of international private capital flows, and/or ‘prudential domestic financial regulations’, which refer to policies, such as capital-adequacy standards, reporting requirements, or restrictions on the ability and terms under which domestic financial institutions can provide to certain types of projects.

Concerned with that amount and volatility of capital flows to emerging economies after the contagious of the 2008 crisis, IMF revised its official position towards capital controls, that now can be considered as a ‘measure of last resort’, when all other macroeconomic policies and regulatory measures are exhausted. Some authors have criticized the IMF new institutional view as insufficient to deal with some emerging economies macroeconomic issues. They argue that by defining capital controls as temporary and a measure of last resort this approach poses serious limits to the policy space that is required to emerging countries. Furthermore, the IMF hierarchy is seen as inappropriate as it seeks to draw lines between macro-prudential measures,

measures to influence the exchange rate and capital controls defined in a jurisdictional manner as discrimination against the residency of investors.

Concerning the Brazilian experience, some lessons can be learned in dealing with capital flows and agents FX positions, and with Trade and Investment treaties:

(i) In countries with open, depth and non-deliverables FX derivatives markets, a third type of regulation, the FX derivatives regulation, need to be adopted along with capital controls and prudential financial regulation. While other countries faced only a problem of low efficacy of these two regulations due to the high leverage degree of derivatives operations, in Brazil they turned out to be ineffective as these operations are liquidated in Brazilian currency. This means that they are likely to have an impact on the exchange rate with very low or even without any foreign capital inflows or outflows taking place. Besides that, most of these synthetic operations are carried out in the Brazilian futures exchange – the derivatives organized market – by a wider set of agents beyond banks: resident institutional investors, resident companies and foreign investors. Unlike the case of Korea, the FX derivatives market is not completely dependent on the banks action. Thus, neither prudential financial regulation measures nor capital controls are sufficient to curb these operations.

(ii) It is important to any emerging country, even to those that have liberalized capital account, to preserve the right (both in terms of domestic and international norms, agreements and laws) to implement CAR. In Brazil's case, CAR and FXDR have had two goals: (a) a macro-prudential one, namely, limiting the financial fragility associated with capital flow reversals and FX derivatives exposures; (b) an economic policy one, in other words, increasing the policy space to control the key macroeconomic prices (exchange rate and interest rate). There are important feedbacks between these two goals: as the Brazilian experience before the global financial crisis showed, currency appreciation stimulates speculative positions in FX derivatives, threatening financial stability. Therefore, the capacity of maintaining the exchange rate in a competitive level (second goal) contributes to financial stability (first goal).

(iii) There are important feedbacks to be found between capital controls and prudential financial regulation, as much as between these measures and macroeconomic policy. Moreover, capital controls need to be instituted to cover particular types of capital flows that are outside the scope of prudential regulation (for instance, foreign

loans by non-financial companies). Therefore, it is not possible to establish a clear cut triple hierarchy between instruments to manage capital flows as supported by the current IMF approach (Ostry et al, 2010; IMF, 2012b).

(iv) A wider interest rate differential stimulates regulatory arbitrage, mainly in case of countries with sophisticated financial markets. In this context, CAR and FXDR have to be even more dynamic, flexible and adjustable, involving a steady “fine-tuning” to close the loopholes found by private agents through spot and FX derivatives transactions. Only when Brazilian government adopted all of the three kinds of techniques simultaneously (capital controls, prudential financial regulation and FX derivatives regulation), the policy effectiveness increased in terms of protecting the exchange rate from upward pressures.

(v) CAR and FXDR need to be a permanent, yet flexible part of the policy toolkit of emerging economies to increase their policy space and reduce the risks associated with liability structures towards capital flow reversals. CAR and FXDR are integral part of the macroeconomic policy, as they can help economic authorities to face and eventually solve some macroeconomic trade-offs, as it is the case of a situation in which central bank under an environment of capital flows surge wants for some reason to increase the interest rate and at the same time aims of avoiding a further currency appreciation. Or, another situation in which central bank wants to intervene in the foreign exchange market in order to affect nominal exchange rate, and at the same time would like to avoid the fiscal costs to sterilize such operations.

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Table Annex 1. Brazil: Capital account regulation (capital controls and prudential financial regulation) and FX derivatives regulation after the global financial crisis

Data	Number and Kind	Measure	Agents
Oct./2009	1 ^o CC	The Ministry of Finance implemented a 2% financial transaction tax (IOF) on non-resident equity and fixed income portfolio inflows.	Non-resident investors
Oct./2010	2 ^o CC	(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 (iii) Limitations were also introduced on the ability of foreign investors to shift investment from equity to fixed income investment	Non-resident investors
Oct./2010	1 ^o FXDR	(i) IOF on margin requirements on FX derivatives transactions increased from 0.38 percent to 6 per cent (ii) Loopholes for IOF on margin requirements were closed: foreign investors in the futures markets were no longer allowed to meet their margin requirements via locally borrowed securities or guarantees from local banks, which allowed them to avoid payment of the tax	Resident banks, institutional investors and companies and non-residents investors
Jan./2011	1 ^o PR	Non-interest reserve requirement equivalent to 60 percent of bank's short dollar positions in the FX spot market that exceed US\$ 3 billion or their capital base, whichever is smaller (to be implemented over 90 days)	Resident banks
Mar./2011	3 ^o CC	Increased to 6 percent the IOF on new foreign loans (banking loans and securities issued abroad) with maturities of up a year. Companies and banks previously only paid a 5.38 percent IOF on loans up to 90 days.	Resident banks and companies
April/2011	4 ^o CC	(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	Resident banks and companies
July/2011	2 ^o PR	The Non-interest reserve requirement became mandatory for amounts over USD 1 billion or their capital base (whichever is smaller).	Resident banks
July/2011	2 ^o FXDR	Excessive long positions on BRL off all agents pay a financial tax of 1 percent. This tax can be increased up to 25 per cent	Resident banks, institutional investors and companies and non-residents investors
Dec/2011	5 ^o CC	IOF on equity and fixed income (linked with infrastructure projects) portfolio inflows reduced to 0%.	Non-resident investors
Mar./2012	6 ^o CC	(i) 6 percent IOF extended for both new and renewed foreign loans with maturities of up to 3 years (ii) Export advanced payment transactions with maturities of more than a year prohibited (iii) 6 percent IOF extended for both new and renewed foreign loans with maturities of up to 5 years	Resident banks and companies
Mar./2012	3 ^o FXDR	Exporters hedge operations (up to 1,2 times the exports of the previous year) exempted from the IOF.	Resident exporters
June/2012	7 ^o CC	6 percent IOF only for new and renewed foreign loans with maturities of up to 2 years (namely, the changes	Resident banks and companies

Source: Authors' elaboration based on Central Bank of Brazil's and Minister of Finance's websites.