

Capital account regulation as part of the macroeconomic regime: Comparing Brazil in the 1990s and 2000s*

Barbara Fritz* and Daniela Magalhães Prates**

Abstract

Capital account regulation (CAR) has experienced profound reconsideration since the global financial crisis. This new debate focuses on the macroeconomic gains of regulating international capital flows in terms of reducing external and financial vulnerability, but it does not consider relevant aspects relating the context in which these regulations are implemented. In this paper, we undertake a comparative analysis of similar types of CAR applied in Brazil during the 1990s and the 2000s. Based on this analysis, we conclude that for the design of CAR, which is relevant for its effectiveness, both institutional features of the financial market, and the macroeconomic regime, shaped by macroeconomic constraints, are relevant. For the case of Brazil, we conclude that contrary to the 2000s, the strong preference given to inflation stabilization in the 1990s, together with high external vulnerability, strongly limited the CAR's design of this period.

Key words: Macroeconomic regime; Capital account regulation, Capital flows, Emerging economies

1. Introduction

The issue of the regulation of international finance garnered greater attention in the years following the global crisis of 2008. The countercyclical monetary policies in advanced economies brought a new wave of high and volatile capital flows to emerging economies. These finally caused a major shift in terms of the perspective on the issue of capital flows. While for a long period a microeconomic perspective on the efficiency of international financial liberalization dominated the debate, recent years brought a shift towards a macroeconomic perspective. Currently, the focus is on the macroeconomic gains of regulating international capital flows in terms of reducing external and financial vulnerability. The debate mainly centers around the question if the regulation of capital flows should be an additional instrument to deal with exceptional times

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* Professor of Economics at the Institute for Latin American Studies at the Freie Universität Berlin; barbara.fritz@fu-berlin.de

** Associate Professor of Economics at the University of Campinas (Unicamp, Brazil) and CNPq researcher; prates@unicamp.br.

of high and instable flows, having all other macroeconomic policies exhausted, or if these should be redefined as a permanent instrument of the toolkit for emerging economies for reducing macroeconomic vulnerability.

Less attention has been given to the comparability of capital account regulation among different countries and time periods. A closer look shows that we find here a broad variety not only in terms of the specific tools used which can range from taxes over quantitative controls to verbal persuasion. Also, and not less important, do they differ in their aims. While some are established with the expectation to make capital flows less short term, and with this less volatile, but not less in terms of volume, others are established to overall dampen inflows, in order to shield the exchange rate or the domestic financial sector from major disequilibria.

Our paper seeks to contribute to this comparative perspective by linking the design of CAR to the specific macroeconomic and institutional context these are implemented within. By comparing the application of similar types of CAR in Brazil during the 1990s and the 2000s, we ask which variables do shape the design of CAR. We assume that the effectiveness of CAR is a consequence of its design. Our hypothesis is that even if institutional features of the financial market matter, which was one of the main conclusions of empirical studies of the 1990s, the macroeconomic regime, shaped itself by external constraints, is of even higher relevance.

We define the macroeconomic regime as an intermediary concept between global structures and economic policies at the domestic level. Following Herr/Kazandziska (2011: 2) we understand the macroeconomic regime as

“the interaction between monetary policy, fiscal policy, wage policy and foreign economic policy within a framework of both: macroeconomic institutions which can be actively changed by policy-makers and become part of economic policy, and institutions which are beyond the control of policymakers”.

In this paper, we will focus on the embeddedness of CAR specifically within monetary and exchange rate policies, as these are the most interrelated policy fields with the management of international capital flows. Emerging market economies are especially more susceptible to external vulnerability, caused not only by the volatility of export prices and capital flows, but also by the fact that their external debt is mostly denominated in international currency. We argue that the choice of macroeconomic regime is shaped by domestic preferences as well as by the current setting of international constraints.

We will firstly give an overview on the debate on CAR (part 2). Secondly, we present the empirical literature for the case of Brazil both for the 1990s and the 2000s (part 3). Thirdly, we undertake a qualitative assessment of the design of CAR implemented in Brazil during these two periods within their macroeconomic and institutional context and compare them (part 4 and 5). Finally, we draw some general conclusions (part 6).

2. Capital account regulation: an overview

For an astonishingly long time, the dominant position had been to reject capital controls, based on neoclassical welfare theory. From this standpoint, there were three main arguments in favor of liberalized capital flows: First, intertemporal trade, that is temporary import of savings, would allow for intertemporal smoothing of investment and consumption, to be reversed later via an increased volume of produced goods and/or increased productivity (e.g. Dooley 1996). Second, given differing capital endowment – poor countries are assumed to be relatively rich in labor relative to domestically available capital, and rich countries are assumed to be the opposite – capital flows from rich to poor countries should allow for the easing of capital constraints in developing economies leading to higher investment and growth rates and reducing the price for capital, i.e. to interest rate parity in the long run. It should also allow for the international diffusion of new technology (i.e. World Bank 2001). Third, the international allocation of capital was seen as permitting better risk diversification (Fettig 1996) and the possibility of financing riskier projects. Most studies in this period thus were interested mostly to see if capital controls were able to lengthen the maturity of capital inflows (i.e. De Gregorio et al. 2000; Edwards 1999).

The new wave of capital flows finally brought forward a macroeconomic perspective on the gains of regulating international capital flows in terms of reducing external and financial vulnerability. The turn to a more supporting view was brought forward mostly the IMF with its new “institutional view” on capital account liberalization and capital controls (IMF 2012). In this and other related documents (Ostry et al. 2010; IMF 2011) the IMF showed remarkable changes in its approach towards international financial liberalization. It acknowledged that despite substantial benefits such as enhanced efficiency for receiving countries, rapid capital inflows and disruptive outflows also carry risks, especially when countries have not attained a certain level of financial and institutional development. From this angle, capital controls turned to be seen as useful in dealing with the policy challenges of inflow surges and the risk of sudden outflows. In order to avoid the negative connotation of the term “controls”, the IMF labeled its concept as “capital flow management measures” (IMF 2011).

One of the major disputes around this new approach is if these measures should be temporary, or of permanent nature. The IMF concept continues seeing these as an instrument only for especially turbulent times: “The temporary re-imposition of capital flow management measures under certain circumstances is consistent with an overall strategy of capital flow liberalization” (IMF 2012: 15). Also, these measures should only be applied temporarily and when macroeconomic policies such as monetary, fiscal and exchange rate policies are exhausted and sound financial supervision and regulation exercised by strong institutions is in place (ibid, IMF 2012: 19). Others (i.e. Gallagher et al. 2012) criticize this approach as being too narrow. First, for not taking into account theoretical and empirical work on the limited effectiveness and risks associated with international financial liberalization. Second, in the view of these authors, a framework for capital

account regulation should enable recipient countries to pursue counter-cyclical policies to shield themselves from global financial shocks and allow them to pursue a macroeconomic policy mix befitting the country's requirements, constituting a permanent part of the economic policy toolkit of developing and emerging market economies. These authors propose a framework for 'capital account regulation' (CAR), as an analogy to (also permanent) financial regulation, that should enable recipient countries to pursue counter-cyclical policies in an attempt to both shield themselves from global financial shocks and increase their policy space pursuing a macroeconomic policy mix appropriate to the country's requirements.

Despite the relevance given to this topic, Rodrik (2010) stated: "We currently do not know much about designing capital control regimes. The taboo that has attached to capital controls has discouraged practical, policy-oriented work that would help to manage capital flows directly" (Rodrik 2010). Especially the comparability of different CAR measures has gained much less attention in this debate. It still holds, to a certain degree, what Magud et al. (2011) call an "apples-to-oranges-problem": most studies, to our knowledge, do not systematically consider heterogeneity in time and space regarding the macroeconomic context.

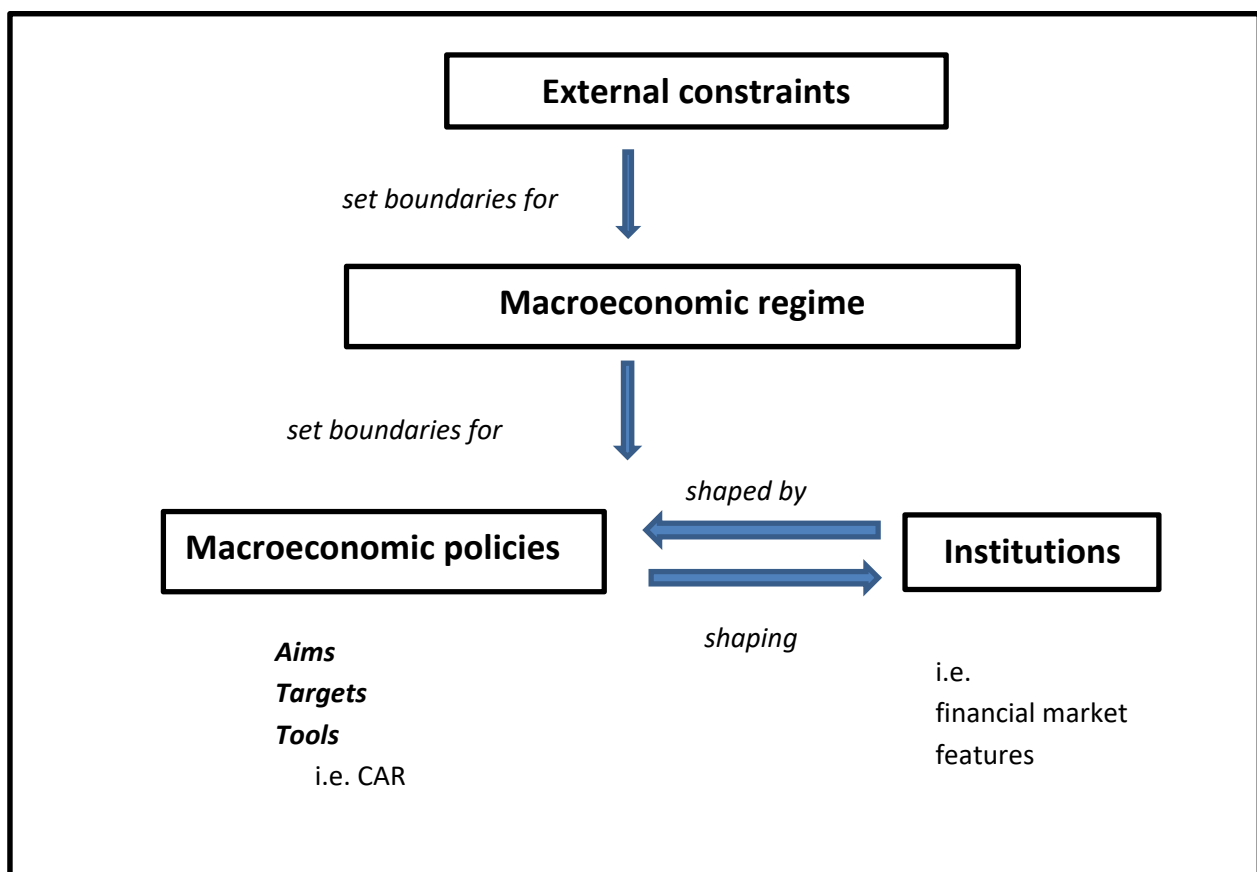
This heterogeneity can be organized in three main categories, following Magud et al. (2011): (i) there is no unified theoretical framework to analyze the macroeconomic consequences of controls in emerging markets, as the debate above shows. (ii) there is great variety in the types of controls: taxes, unremunerated reserve requirements, quantitative restrictions, and verbal persuasion. In view of the sophisticated nature of financial markets, the devil is often in the details – and what works in one setting is unlikely to work well in others. (iii) policy makers implemented the measures based on significantly different aims. Capital controls may aim at banning the inflow of "hot money" by altering the composition of inflows, or at reducing the volume of inflows in order to prevent instability in the domestic financial sector; they may be launched in order to reduce the pressure on the exchange rate, or to make more policy space for an independent monetary policy at the domestic level. Even if these aims are partially interdependent, criteria for the 'success' of capital controls have to be adjusted to case-specific policy goals.

Regarding the first aspect, we assume the necessity for emerging economies to reduce especially the degree of external vulnerability for enhancing their domestic economic policy space requires the permanent management of capital flows; then, we adhere to the use of the concept of CAR (see also Fritz/Prates 2014; Gallagher, Griffith-Jones and Ocampo, 2012). In this paper, we thus focus on the two latter aspects, yet adding a fourth category, the relevant context variables, which also differ over time and space. We identify three context variables.

The first is the current stage of external constraints that, together with the departing conditions of an economy, delimit the choices for a specific macroeconomic regime. Most importantly, net stock of external assets or liabilities, and availability of international liquidity define how far a country can afford to repel

capital inflows. For the macroeconomic regime, as defined above, we will refer herein to the sum of exchange rate and monetary policies which are directly interrelated with the CAR. Second, the stage and state of the domestic economy, together with the preferences of ruling economic and political actor constellations, will influence the aims, targets and tools of the macroeconomic regime and thus the policies in different sub-fields. When CAR are adopted, their aims, and consequently targets and tools will be framed by the aims of the monetary and exchange rate policies underway[†], shaped by the external constraints. The third variable is domestic institutional aspects that, given the aims defined by the interplay of the first and second variables, will shape the tools of CAR. In the case of Brazil, the main institutional aspects are the level of financial openness and the features of the financial market, which encompass the FX market.

Figure 1: Macroeconomic regime



Authors' elaboration.

Empirically, we compare the aims, targets and tools of CAR in Brazil during two periods, the 1990s and the 2010s. Methodologically, our analysis is based on descriptive statistics and qualitative evaluation. Rather short time periods to be analyzed, frequent changes of regulation within these short periods, together with

[†] BIS (2005) adopted the same classification to analyze exchange rate policies of emerging economies.

other variable changes such as repeated changes of capital inflow volumes and composition due to exogenous shocks and changes in monetary and exchange rate policies render time series analysis not very effective. Furthermore, regulations, capital volumes and composition and monetary policies are highly interdependent. For these reasons, we have opted out of econometric analysis in our comparative case study.

3. Capital Account Regulation in Brazil: the case of the 1990s

This section starts with a review of the literature on the CAR implemented in Brazil during the 1990s that focus on the effectiveness of this regulation, disregarding the macroeconomic and institutional contexts. Thereafter, we undertake a qualitative assessment of the design of CAR in such period within the macroeconomic regime in force.

3a. The literature review

Reviewing the literature, most studies focus in evaluating the effectiveness of CAR in Brazil during the 1990s. They argue that these were, at most, only efficient in the short term. In their comparative study on capital controls in emerging markets during the 1990s, Ariyoshi et al. (2000) conclude that ‘the controls maintained by Brazil appear to have been largely ineffective in achieving their stated object’ (Ariyoshi et al. 2000: 17). Thus, Brazil stands out against other cases analysed in their study, where the inflow controls achieved at least some of their intended objectives (maintaining a suitable wedge between domestic and foreign interest rates and reducing upward pressure on the exchange rate).

Others, such as Cardoso/Goldfajn (1997), Carvalho/Garcia (2001) and Reinhardt/Smith (1998), do find that these controls had at least temporary effects, especially on the composition of capital flows, although in the long run capital inflows remained unchanged by capital controls. The main argument brought forward by these studies is the ability of financial actors to circumvent controls due to the elevated sophistication[‡] of the domestic financial sector in Brazil combined with a continuous and substantial interest rate differential, creating a strong motivation to rapidly circumvent the controls.

The main lesson from the Brazilian experience seems to be that the effectiveness of capital controls might be limited in an environment where the sophistication of the financial markets reduces the cost of circumvention relative to the incentives for circumvention. In the long run, repeated attempts by the authorities to restrict capital inflows were unsuccessful, since capital continued to find ways to enter the economy, particularly in view of the persistent incentives provided by interest rate differentials that remained high (Ariyoshi et al. 2000: 45f.).

[‡] To our knowledge, there is no established concept of financial market sophistication in the academic literature. The World Bank composes a very ample indicator of financial market sophistication with the following sub-indicators: (i) availability of financial services; (ii) affordability of financial services; (iii) financing through local equity markets; (iv) ease of access to loans; (v) soundness of banks; (vi) regulation of securities exchanges; and (vii) legal rights index (see: <http://worldbank.270a.info/classification/indicator/GCI.8THPILLAR.XQ.html>). Again for the sake of operationalization, in this paper we adopt a narrow concept of financial market sophistication, which refers to the availability of liquid and deep markets with developed countries’ state-of-the art financial innovations, such as financial derivatives.

The evaluation of Williamson et al. (2003) points in a similar direction, but with reversed causality: Brazilian capital import controls were limited in their efficiency because the complexity of and frequent changes in the regulations to cope with circumvention strategies had weakened them.

Table 1. Literature survey: Evaluation of effectiveness of [1990s] capital controls

Authors	Reduces volume	Lengthens maturity
Ariyoshi et al. (2000)	0	0
Cardoso/Goldfajn (1998)	short term	short term
Garcia/Barcinski (1997)	No econometric test; yet find CC ineffective for reduction of volume	
Reinhart/Smith (1998)	short term	short term
Carvalho/Garcia (2001)	short term	short term
Williamson et al. (2003)	short term	short term

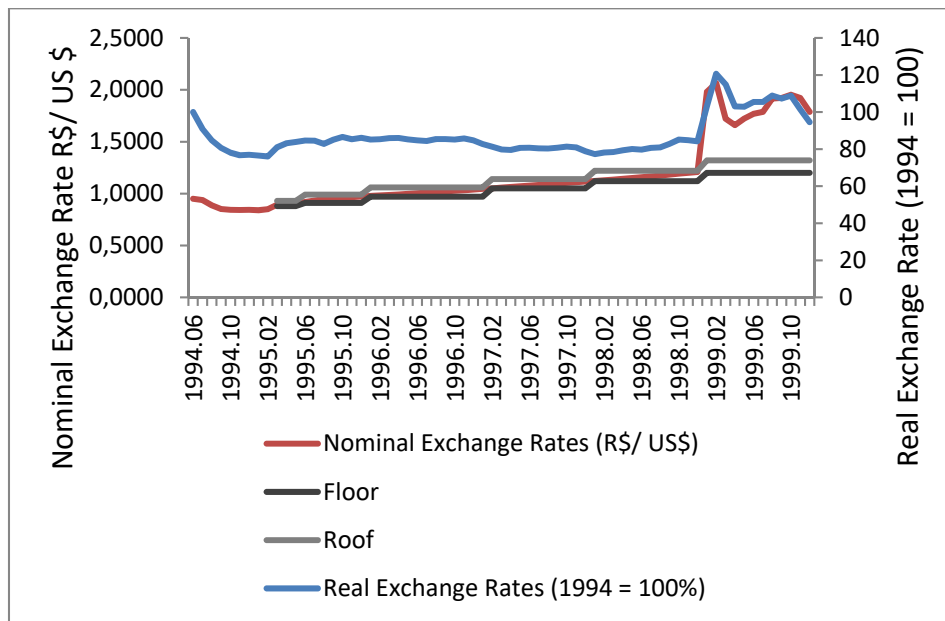
Source: own compilation

3b.: CAR under conditions of exchange rate-anchored stabilization and external vulnerability

Coming off a lengthy process of rocketing inflation and a profound external debt crisis, Brazil managed to successfully stabilize its currency by using the exchange rate as a nominal anchor in 1994. The so-called *Plano Real* quickly took inflation down from almost 3000% p.a. in 1993, to gradually achieve a level of less than 10% p.a. from 1996 on. In doing so, it followed the path of a large number of developing and emerging market economies, especially in Latin America and South East Asia, which opted for an exchange rate anchor during the 1990s. The aim was to gain credibility in terms of inflation expectations by clearly prioritizing the maintenance of a predetermined nominal exchange rate level in economic policy strategy. This was supposed to discipline monetary and fiscal policies at the domestic level (for an overview see Singh et al. 2005, and Fritz 2000).

The Brazilian version of the exchange rate anchor was not a radical fixing of the exchange rate (as was the case with neighbouring Argentina), but rather a fixing of the nominal exchange rate within a crawling band from March 1995 until January 1999. Devaluations of the crawling band ex post appeared to be rather constant (0.7% p.m.), but were handled discretionarily (graph 1).

Graph 1. Exchange Rate (real and nominal) and Exchange Rate Band (ex post)



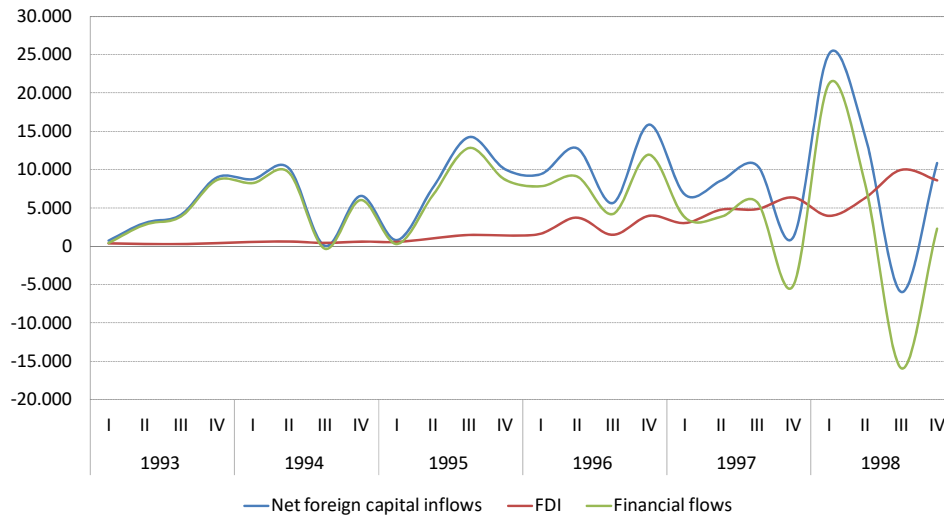
Source: IPEA data, authors' own compilation

Due to inflation rate differentials that constantly outstripped nominal devaluation, the Brazilian currency significantly appreciated against the rest of the world currencies in real terms. Together with trade liberalization, this real appreciation sharply turned trade flows. The current account, after having shown a slight surplus for some years, experienced sharply increased deficits between 1995 and 1999.

Simultaneously, capital inflows started growing quickly (see graph 2). This surge was related to the swift inflation stabilization, but there were additional factors: (i) a Brady Plan for Brazil (concluded in April 1994) which finally regularized the country's relations with the international financial community; (ii) sinking international interest rates in response to the advanced countries recession in the beginning of the 1990s, which increased the volume of capital offered to emerging economies (Calvo et al. 1993); (iii) a comprehensive privatization program of Brazilian public firms and banks, where international investors were explicitly invited to participate (iv) and, last but not least, the opening of the Brazilian capital account, which was a precondition for the Real Plan inasmuch as it enabled capital inflows and the accumulation of foreign exchange reserves in the period of 1990-93[§] (Paula 2011).

Graph 2. Net foreign capital inflows – USD million

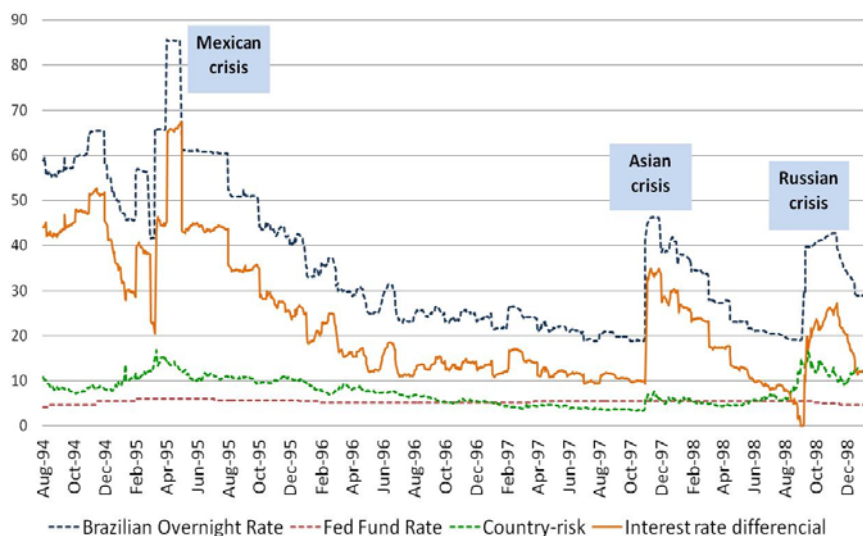
[§] In 1991 and especially in 1992, the Brazilian Central Bank launched a series of measures in order to benefit from capital inflows that had started in 1991. The main measures were: (i) the Brazilian capital market was opened for international portfolio flows inasmuch as the direct acquisition of Brazilian firms' equities by foreign institutional investors was permitted; (ii) foreign investors were also allowed to invest in derivatives markets (limited since 1995 to operations to hedge positions in spot markets, as mentioned below); (iii) firms were allowed to issue new types of securities abroad (such as commercial papers) and securities convertible into stocks; and (vi) the additional income tax on profit and dividend remittance abroad was abolished. Yet, in face of the excessive short term capital inflows, in 1993, some administrative capital controls were adopted: tax-exempted channel ('Annex IV') for foreign investment funds to go into fixed-yield bonds (especially public bonds) was closed; foreign portfolio investments into debentures (private fixed-yield bonds) were prohibited and, at the same time, a specific channel for international fixed income (Foreign Capital Fixed Yield Funds) with a 5% financial tax (IOF) was created; a broader range of fixed-income securities, including derivatives and privatisation bonds, was forbade (Paula 2011).



Source: BCB. Authors' elaboration.

A strong incentive for capital inflows via bank credit and portfolio capital, in particular, was the high interest rate differential. Nominal and real interest rates in Brazil remained at a very high level (see graph 3), as monetary policy, despite the stabilising effects of the exchange rate anchor, still had to compensate for only gradually evading inflation expectations and a softened version of exchange rate-based inflation stabilization to curb domestic demand and attract capital flows in face of both the increasing current account deficit and the need to refinance the huge external debt accumulated during the 1970s. Then, besides the still high inflation, the Brazilian economy faced an increasing external vulnerability as macroeconomic constrains, becoming highly sensitive to shifts in the international financial market.

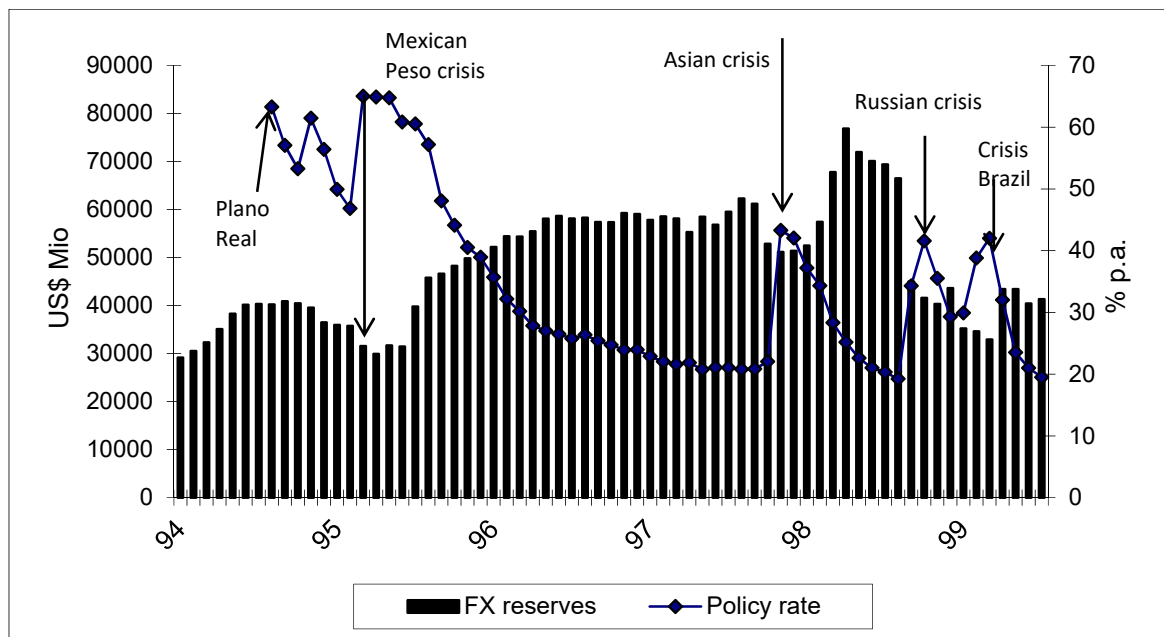
Graph 3. Interest rate differential and its components (%)



Source: ECB and Federal Reserve. Authors' elaboration.

As a result, the macroeconomic regime had to be conducted primarily in order to ensure capital inflows in sufficient quantity, resulting in a sequence of stop-and-go periods. The definition of the internal interest rate level was highly correlated to the quantity of capital inflows and FX reserves. Every time capital inflows shrank or even reversed due to external shocks, the domestic interest rate had to be hiked in order to both reduce the volume of imports and encourage additional capital inflows (see graph 4). This led to a stop-go process, due to the repeated necessity of repressing internal demand in order to control external accounts.

Graph 4. Brazil: Domestic Interest Rate and Foreign Exchange Reserves (1994-99)



Source: Boletim do Banco Central do Brasil.

During the boom phases of the international capital flow cycle, the high interest rate differential offered by Brazil resulted in excessive short-term financial inflows, above the current account deficit. In these phases, the central bank needed to pursue direct interventions both in the exchange market to control the nominal exchange rate level and in the monetary market through sterilisation operations to maintain a restrictive monetary policy, overburdening the fiscal costs of capital inflows. As Kregel (2000: 5) summarized:

“(...) the success of the Real Plan was on capital inflows buttressing the nominal exchange rate anchor in the face of rising current account imbalances. The success of the Plan thus made necessary domestic interest rates that were sufficiently high to produce a sufficiently large international interest rate differential to sustain capital inflows (...) The capital inflows in excess of what was required to finance the current account imbalance was countered by sterilisation of the inflows at negative carry that also increased the government deficit and thus outstanding debt.”

In face of the increasing fiscal costs of sterilisation operations through emission of public bonds, the Brazilian government chose to adopt capital controls mainly to lengthen the maturity of foreign portfolio investment in face of the increasing external vulnerability. A secondary aim was to reduce their volume in moments of excessive inflows.

Thus, Brazil joined the small group of emerging countries which applied these controls. From 1993** to 1999, with temporary interruptions due to stop phases within the capital flows cycle, the central bank launched a series of measures, meant to discourage short-term capital inflows, principally short-term foreign loans and foreign portfolio investment into the public bond secondary market. These controls took the form of an entry tax, called the Tax on Financial Operations (*Imposto sobre Operações Financeiras – IOF*), in conjunction with minimum maturity for portfolio investments and administrative controls to close channels for short term inflows (see table 3).

Table 3. Capital Account Regulation 1993-1999

	Tighten or Loosen	Measure
Mar./1994	Tighten	Entrance tax extended to all portfolio investments, although the initial level at the beginning was set as zero. This was meant as a 'clear signal as to the possibilities of taxing these operations' (BCB, 1995)
Oct./1994	Tighten	Entrance tax on most portfolio investments and loans raised: from 5% to 9% for investments in Foreign Capital Fixed Yield Funds; from 3% to 7% in the case of loans; and from 0 to 1% in the case of Annex IV investments
March/1995	Loosen	(i) Minimum stay periods, expanded in June 1993 for certain types of capital inflows, were reduced (ii) Entrance tax decreased to pre-October 1994 levels (and foreign loans excluded from any entrance taxation)
Aug./1995	Tighten	(i) The entrance tax re-established for foreign loans (5%) and Foreign Capital Fixed Yield Investment Funds (7%), and broadened to include the floating-rate segment for short-term finance between international and national banks (another way found by the market to circumvent the restrictions) (ii) Foreign investors' access to the derivative markets limited to hedge operations related with their portfolio investments in equity and fixed-income bonds.
Set./1995	Tighten	Entrance tax adopted as a decreasing scale, inversely related to loan maturity (5% for two years or less, 4% for three years, 2% for four years, 1% for five years, and 0% for 6 years or more)
Feb./1996	Tighten	(i) Most remaining channels for short-term inflows into fixed income investments and fixed income-linked strategies forbidden outright. (ii) Minimum maturity for all currency loans extended to three years (ii) Entrance tax to investments in privatisation funds extended
July/1997	Loosen	Minimum maturity for all currency loans shortened to one year and entrance tax reduced
Aug./1998	Loosen	Minimum maturity and entrance taxes reduced.

Sources: Garcia/Barcinsky (1997); Blumenschein/Guinle (2001); and Ariyohsi (2000) for the period of 1992–96. Analysis of changes in capital account regulation for the period of 1997 until 2000 is based on Boletim do Banco Central do Brasil, Relatório Anual (1999; 2000); AREAER (various issues); Paula et al. (2003); Franco/Pinho (2004).

** Already in 1993, within the context of substantial exchange market liberalisation but still with very high inflation, the government had begun a gradual process of 'throwing sand in the wheels' of short-term capital inflows directed to fixed-income securities.

The regulations were adjusted within the stop-go cycle of volatile capital inflows due to financial crisis episodes in other emerging market economies, tightening or loosening depending on the moment of the cycle. This fine tuning of capital controls was necessary to maintain the volume of inflows needed to finance the current account deficit (the main macroeconomic constrain), then ensuring the maintenance of the exchange-rate anchor (the macroeconomic regime). In this setting, the institutional features of the Brazilian financial added challenges to the CAR strategy (see Table 4).

Given the middling financial openness and middle to high level of domestic financial market sophistication, foreign investors constantly succeeded in detecting ways to circumvent the capital inflows controls in order to invest in high-yielding public bonds, as stated also by the literature on capital controls in Brazil in this period. Thus, over the boom phases of the international capital flows cycle, the central bank continuously had to further broaden controls in order to cover existing regulation gaps. For example, to cope with swelling inflows, the financial tax was first extended to a broad range of capital inflows in March 1994, and then raised in October of the same year. In other words, CAR continuously had to be revised within a regulatory arbitrage cat-and-mouse game between regulators and international investors^{††}. Yet, it is important to notice that this game repeatedly came to an end when that cycle entered into a bust phase. Accordingly, the two moments of loosening capital controls during this period are related to contagion effects of the Mexican financial crisis in the beginning of 1995, and the so-called Asian crisis in 1997 (see table 3). In face of the high external vulnerability and the inevitable depletion of international reserves, a currency crisis broke out in January 1999, resulting in the collapse of the exchange rate-anchored macroeconomic regime.

Table 4. Brazil 1990s

Macroeconomic constraints
<ul style="list-style-type: none"> - External vulnerability: High (high external debt; high current account deficit) - Inflation: High
Macroeconomic Regime

^{††} For a detailed description of the financial strategies used by financial market players to avoid capital controls in Brazil during the 1990s, see: Cardoso/Goldfajn (1997), Carvalho/Garcia (2006).

<p>Macroeconomic policy: <i>Exchange rate-anchored stabilization</i> <i>Aim:</i> Inflation reduction <i>Target:</i> Inflation rate <i>Tools:</i></p> <ul style="list-style-type: none"> - stabilize nominal exchange rate - CARs <p><i>Aim:</i> maturity prolongation; sporadically, volume reduction <i>Target:</i> capital flow maturity <i>Tools:</i> price-based capital controls (financial tax); administrative controls</p>	<p>Institutions</p> <ul style="list-style-type: none"> - <i>Financial openness:</i> middle to high - <i>Financial market sophistication:</i> middle to high (derivatives)
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Source: Authors' own compilation

4. Capital Account Regulation in Brazil: the case of the 2000s

As in the last section, we start with a review of the literature on the CAR implemented in Brazil during the 2000s, which also focus on the effectiveness of this regulation, disregarding the macroeconomic and institutional contexts. Thereafter, we undertake a qualitative assessment of the design of CAR in such period within the macroeconomic regime in force.

3a. The literature review

There are some empirical studies evaluating the effectiveness of the Brazilian CARs and FXDRs over 2009-2012. Based on an econometric model (a GARCH regression), Baumann/Gallagher (2012) have found that the introduction of CAR in Brazil between October 2009 and December 2012 was associated with a shift from short-term to longer-term inflows. They have also found that Brazil's measures had a lasting impact on the level and volatility of the exchange rate and modestly increased the autonomy of Brazilian monetary policy.

Chamon/Garcia (2013) conclude that the controls adopted by the Brazilian government were effective in the sense of creating distortions in the pricing of financial assets, i.e., making the domestic assets more expensive, which is one of the goals of the controls. Therefore, controls were effective in partially segmenting the Brazilian financial market from the international market. However, the controls do not seem to have been effective to deter the appreciation of the BRL when capital inflows were strong, a stated objective of the Brazilian authorities. Yet, the authors stressed that they "cannot rule out, however, that the cumulative

effect of the controls strengthened the effect of the large cut of the basic interest rate (Selic), by 5.25bps, in depreciating the BRL since March 2012”^{‡‡}.

Finally, Klein (2012) concludes that the Brazilian IOF was an episodic control on the capital inflows that did not temper the appreciation of the Brazilian currency; but the period covered in his study ended in 2010, before the adoption of a broader set of regulation, as detailed in the next section.

Table 2. Literature survey: evaluation of effectiveness of [2000s] CARs

Authors	Capital flows	Exchange rate	Monetary policy autonomy
Chamon/Garcia (2013)		No direct impact, but probably indirect	Increased
Baumann/Gallagher (2012)	Lengthens maturity	Lasting (but small) impact on the level and volatility	Modestly increased
Klein (2012)		No impact	

Source: own compilation

4b. CAR in the context of dirty inflation targeting and lower external vulnerability

After the 1999 currency crisis, Brazil adopted a new macroeconomic regime featured by a floating exchange rate and an inflation target policy. The change in the macroeconomic stance was accompanied by a deepening of the process of financial opening in January 2000, when Resolution CMN n. 2689 authorized the unrestricted access of nonresident investors to all segments of the domestic financial market, including the derivatives market. Luis Inácio Lula da Silva’s (thereafter Lula) economic policies, beginning in January 2003, were marked by the continuity of this macroeconomic regime^{§§}. Yet, in contrast with the previous period (1999-2002), it was implemented in an exceptionally favorable international context, featured by rising commodity prices and a boom of capital flows to emerging countries (Ocampo, 2007).

In this setting, opting for a tight monetary policy under the conditions of high financial openness ensured the effectiveness of the inflation targeting policy through the appreciation of the Brazilian currency, but forced the monetary authorities to abandon any kind of target for the nominal exchange rate. The main determinant of the currency appreciation in this period was the derivative carry-trade operations fostered by the very high interest rate differential (see graph 5). On the contrary of the canonical carry trade through spot market operations (borrowing low interest rate currencies and lending high interest rate currencies), in the FX derivatives market the carry trade expresses itself as a bet which results in a short position in the funding

^{‡‡} It is worth mentioning that neither Baumann/Gallagher (2012) nor Chamon/Garcia (2013) consider the regulation of FX derivatives to be another kind of regulation distinct from capital controls and financial prudential regulation.

^{§§} The Brazilian economy became fully open to capital inflows and outflows in Lula’s first term: in 2005, residents' capital exports were fully liberalized; and, in 2006, returns of government bonds owned by foreign investors were exempted from income tax. For a comprehensive analysis of the process of Brazilian financial opening, see Paula (2011).

currency and a long position in the target currency (Burnside et al. 2006; Gagnon/Chaboud 2007; Kaltenbrunner 2010).

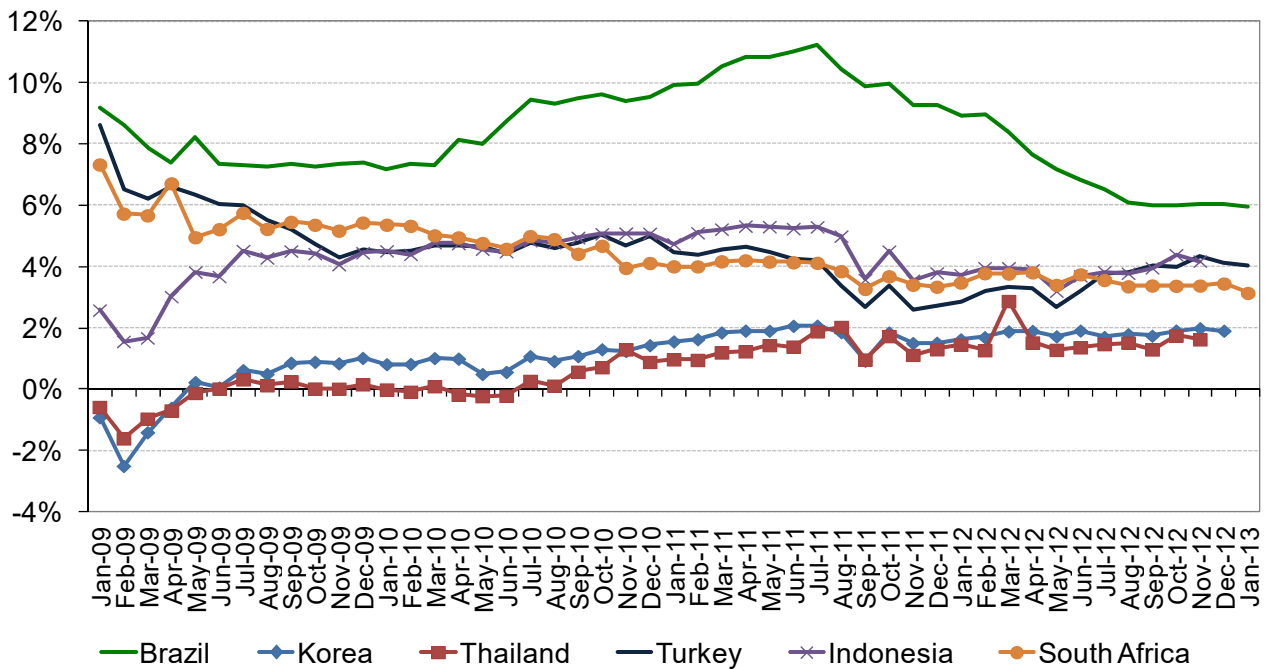
The predominance of this kind of currency speculation strategy stemmed from the greater liquidity and depth of the FX futures market (i.e., the organized segment of the FX derivatives markets) in comparison with the FX spot market, fostered by foreign investors' unrestricted access to this segment since 2000. This sophistication of the Brazilian currency market rendered the FX futures market the locus of formation of the BRL/USD exchange rate (Kaltenbrunner, 2010; Chamon and Garcia, 2013). Moreover, the non-deliverable feature of the Brazilian FX derivatives market (i.e., operations are settled in BRL, the only legal tender in the country) has made the derivatives carry trade even more attractive in Brazil, inasmuch as foreign and domestic agents can engage in it without disbursing a single US dollar (Fritz/Prates, 2014).

At the same time, like many other emerging economies, Brazilian policy makers adopted the strategy of paying off the public external debt and building up international reserves which aimed at strengthening the country's external position, the so called "precautionary demand" for reserves (Aizenman et al., 2004; Carvalho, 2010; Dooley et al., 2005)***. As Rodrik (2006, p.12) points out, over the international capital flows boom before the global financial crisis, these countries "over-invested in the costly strategy of reserve accumulation and under-invested in capital account management policies."

Therefore, when the new cycle of capital flows to emerging economies surged after the 2008 global financial crisis (Akyüz, 2011), Brazil did enjoy a rather low level of external vulnerability. Over the boom of the cycle, the country was one of the main destinations of short term portfolio investments (IMF, 2011) and suffered strong currency appreciation pressures from 2009 to mid-2011. This was due to a set of encouraging domestic factors: (i) the fast economic recovery; (ii) the post-crisis commodity price boom; (iii) a very high interest rate differential in comparison to other emerging economies (graph 5) and (iv) the opportunity for high return through derivatives carry trade in the Brazilian futures exchange. Once again, 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 Graph 6).

Graph 5: Interest rate differential ⁽¹⁾ – Brazil and other emerging economies

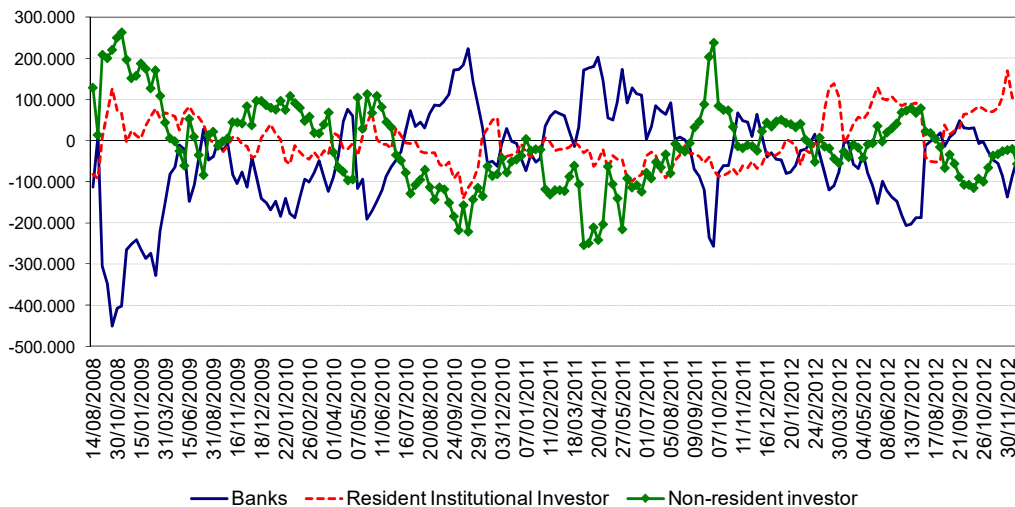
*** During this period the Brazilian monetary authority pursued a strategy of intervention in the FX market known as "leaning against the wind" (Archer 2005), which attempted to reduce the exchange rate volatility without influencing the exchange rate trend. Yet, this strategy resulted in an excessively high cost of sterilization operations due to the large differential between internal and external interest rates (Prates, Cunha, and Lélis 2009).



Source: BCB. Authors' elaboration

Note: (1) Interest rate differential = country policy rate minus Fed Fund Rate plus country-risk.

Graph 6. Investors' net positions in FX futures (number of USD futures contracts)⁽¹⁾



Source: BMFBovespa. Authors' elaboration.

Note: (1) Positive values means short BRL/long USD positions (bets on BRL depreciation) and negative values long BRL/short USD positions (bets in BRL appreciation).

Nevertheless, on the contrary of the pre-crisis context, Brazil did not adopt a hands-off approach to capital inflows. The government gradually moved towards a macroeconomic strategy where preventing currency appreciation gained relevance alongside the priority of inflation stabilization. This appreciation became an increasing concern due to its adverse impact on Brazilian industrial competitiveness which has faced a much greater competition both in the international and domestic markets in the post-crisis setting. The introduction of CARs with the explicit goal of curbing the appreciation trend of the BRL, yet without giving up the formal strategy of inflation targeting, led to what we call 'dirty inflation targeting' – where the exchange rate goal gained increasing room in the definition of the macroeconomic policy strategy.

In October 2009 the Brazilian government adopted a light price-based capital control measure (see Table 5), which was insufficient to curb the currency appreciation trend (graph 7). Within this macroeconomic setting, the aim was clearly different from the 1990s, as the statement of Finance Minister Guido Mantega on October 21, 2009 (the day after the first control was announced) clarifies: “We want to prevent an excessive appreciation of the real. When the real appreciates, it makes our exports more expensive and our imports cheaper, and we already have an expressive increase in imports while the exports are not growing as they should” (cited in Chamon/Garcia 2013: 7).

Graph 7: Brazil: BRL–USD Exchange Rate (nominal) and tighter regulations applied



Source: Central Bank of Brazil. Authors' elaboration.

The specific features of the Brazilian financial market, mainly, the key role of the FX derivatives market on the exchange rate determination, as mentioned above confronted Brazilian policymakers with greater challenges to curb the currency appreciation than those faced by other emerging economies. The Brazilian regulatory authorities recognized these constraints, albeit tardily. From October 2010 to the end of 2012 they implemented, along with capital controls, prudential financial regulations and FX derivatives regulations (FXDR) which apply to the FX derivatives operations of all agents, be they nonresidents or residents, financial or nonfinancial actors (see Table 5).

Table 5. Capital Account Regulation 2009-2012

Date	Number and Kind ⁽¹⁾	Tighten or Loosen	Measure
Oct./2009	1 ^o CC	Tighten	Implementation of a 2% financial transaction tax (IOF) on non-resident equity and fixed income portfolio inflows.
Oct./2010	2 ^o 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.
Oct./2010	1 ^o FXDR	Tighten	(i) IOF on margin requirements on FX derivatives transactions increased from 0.38 to 6 per cent (ii) Loopholes for IOF on margin requirements closed
Jan./2011	1 ^o PR	Tighten	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
Mar./2011	3 ^o CC	Tighten	Increased to 6 percent the IOF on new foreign loans with maturities of up a year.
April/2011	4 ^o 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 ^o PR	Tighten	Non-interest reserve requirement mandatory for amounts over USD 1 billion or capital base (whichever is smaller).
July/2011	2 ^o FXDR	Tighten	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
Dec/2011	5 ^o CC	Loosen	IOF on equity and fixed income (linked with infrastructure projects) portfolio inflows reduced to 0%.
Mar./2012	6 ^o CC	Tighten	(i) 6 percent IOF extended for both new and renewed foreign loans with maturities of up to 3 and then to 5 years (ii) Export advanced payment transactions with maturities of more than a year prohibited
Mar./2012	3 ^o FXDR	Loosen	Exporters hedge operations exempted from the IOF.
June/2012	7 ^o CC	Loosen	6 percent IOF only for new and renewed foreign loans with maturities of up to 2 years.
Dec./2012	8 ^o CC	Loosen	(i) 6 percent IOF for foreign loans with maturities of up to 1 year (ii) Export advanced payment transactions maturity extended from 1 for 5 years.

Source: Own elaboration based on BCB's and Minister of Finance's websites.

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

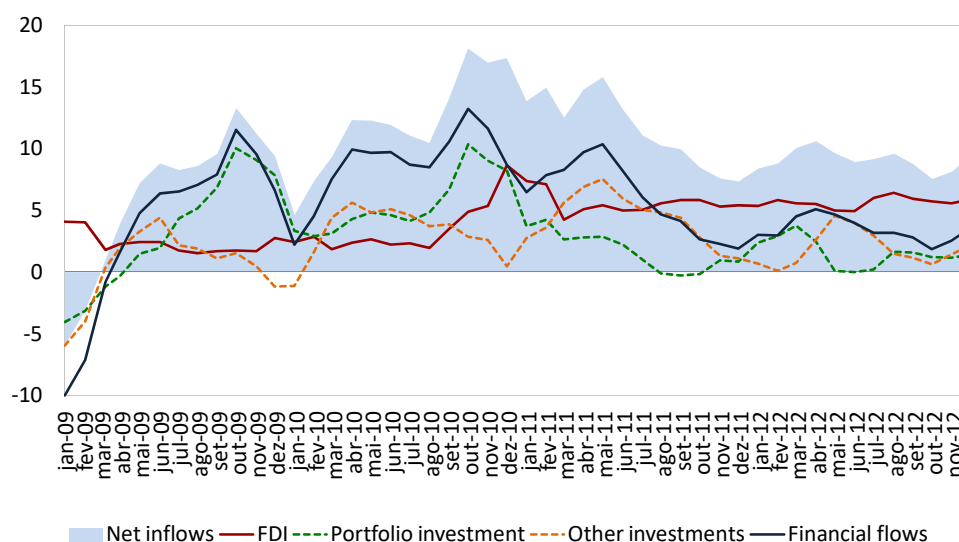
This third class of regulation technique was key in restraining the BRL appreciation trend and, in turn, mitigating the Brazilian government's economic policy dilemma regarding how to contain the growth rate and inflationary pressures without reinforcing exchange rate appreciation. On the one hand, as FX derivatives are non-deliverable, capital controls do not reach them (the derivative carry trade could be put in place without any effective foreign currency flows). On the other hand, in the face of the predominance of FX futures, prudential financial regulation also proved insufficient to reach FX derivatives operations, as it did not encompass non-resident investors and non-financial resident agents.

In October 2010, along with the strengthening of the price-based capital control on portfolio investment, the Brazilian government launched the first FXDR (see table 5). However, the first rounds of capital controls and FXDR proved insufficient to halt the BRL/USD exchange rate down trend (i. e., BRL appreciation – see Graph

7). This is because as private agents again found loopholes to circumvent these controls, similar to the process during the 1990s, and FXDR were too lightweight to stem the derivatives carry trade, due to the latter's high degree of leverage. In order to close the loopholes, the Brazilian Central Bank imposed a noninterest reserve requirement (a prudential financial regulation) on FX banks' positions in January 2010 and an IOF on short-term foreign borrowing in March. However, 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 (graph 8). Hence, in April the government extended the IOF both to this class of foreign loans and to intercompany loans, which is one modality of Foreign Direct Investment (FDI) that had also been used as a way of bypassing CAR (see table 5).

Yet, until the first half of 2011, the CAR and FXDR adopted so far mainly impacted the composition of inflows rather than their volume and did not stop the BRL appreciation, its main policy goal (see Graphs 7 and 8). As for the currency appreciation trend, the turning point was in July, when a broader set of FX derivatives regulations was launched. On 29 July 2011, the Ministry of Finance adopted a financial tax of 1 percent on excessively long positions on BRL in the FX derivatives market (see table 5). As this tax is calculated on the notional value of the FX derivatives operations, it had a major impact on the derivatives carry trade. Shortly after this was enforced, the Brazilian currency began depreciating, prior to the loosening of the monetary policy in August (see Graph 7). Since the end of August, the depreciation trend was fostered by the policy rate reductions (Graph 5) and the increase in the risk aversion of foreign agents due to the worsening of the Euro crisis in the second half of 2011.

Graph 8. Net inflows – 3-month average (USD billion)



Source: Brazilian Central Bank. Authors' elaboration.

Hence, despite the higher financial openness and financial market sophistication, in a setting of eased macroeconomic constraints (mainly, the lower external vulnerability), the Brazilian government had the policy space to launch a broader class of regulations to reach the aims of the macroeconomic regime in force

(see Table 6)⁺⁺⁺. Moreover, there are feedback effects between these regulations and the macroeconomic policies. The FXDR may have amplified the effects of the policy rate drops between August 2011 and October 2012 on the BRL/USD exchange rate. In this new external and domestic setting, (lower policy rate and stable exchange rate, and broad regulatory framework), both financial flows and derivatives carry trade operations dwindled (graphs 6 and 8).

Table 6. Brazil 2000s

Macroeconomic constraints	
<ul style="list-style-type: none"> - FX higher than external debt, but current account deficit increasing - Moderated inflation 	
Macroeconomic Regime	
<p>Macroeconomic policy: Dirty Inflation targeting <i>Aim:</i> Inflation control with priority also to RER <i>Target:</i> Inflation and nominal exchange rate <i>Tools:</i></p> <ul style="list-style-type: none"> - Monetary and exchange rate policy - CARs <p style="padding-left: 40px;"><i>Aim:</i> Halt currency appreciation <i>Target:</i> Reduce volume of short-term capital inflows <i>Tools:</i> price-based capital controls (financial tax), administrative controls, prudential regulation, expansion to regulation of FX derivatives => comprehensive regulation</p>	<p>Institutions</p> <ul style="list-style-type: none"> - Financial openness: high - Financial market sophistication: high (derivatives)

Source: own compilation

5. Comparative analysis

The dominant literature for the Brazilian case of capital controls in the 1990s concludes that the effectiveness of capital controls might be limited in an environment where the sophistication of the financial markets reduces the cost of circumvention in view of the persistent incentives provided by interest rate differentials (see section 3a). In turn, most of the empirical literature in the 2000s shows that the regulations adopted over 2009-2011 (CARs and FXDR) had some effectiveness in change the composition of capital flows and curb

⁺⁺⁺ The Brazilian government has had the policy space to engage in such broad regulatory framework because it does not have trade and investment treaties or commitments under the GATS that prohibit the regulation of capital flows and FX derivatives (Paula/Prates, 2013).

the currency appreciation despite the greater sophistication and openness of the Brazilian financial market and the still high interest rate differential (see section 4a).

Our comparative perspective of Brazil's experience with CARs in the 1990s and 2000s is not focused on effectiveness, but on the design of the CARs (see sections 3b and 4b). Comparing the two periods of CAR in Brazil, we find that the overall macroeconomic regime is highly relevant for its design, along with the macroeconomic constraints and the features of the domestic financial market, especially its level of openness and sophistication. While the two first ones frame the aims and, consequently, targets of the CAR, the latter shapes the specific tools that will be put in place to reach these aims.

During the 1990s, the macroeconomic regime gave absolute priority to inflation stabilization. In order to combat four-digit inflation, an exchange-rate anchor was combined to a huge interest rate differential to attract permanent capital inflows. These inflows were required not only to build up international reserves (a pre-condition for the maintenance of that anchor), but also to finance the growing external commitments (cumulative current account deficit and high external debt to be served).

In this setting of still high external vulnerability, the main aim of the CARs was to change the composition of capital inflows from short-term to long-term inflows, i.e. lengthen their maturity. In an international context of highly volatile capital flows and a middle level of financial openness, capital controls had to be adjusted together with domestic policies had along the availability of international inflows. In moments of excessive inflows, controls were introduced or intensified to curb their volume to not overburdening the fiscal cost of sterilization (consequence of the very interest rate differential), and were accordingly relaxed in periods of drying capital inflows. Therefore, the only tool adopted was capital controls (one class of CARs). The institutional features of the financial market in the 1990s played a role in the design of the specific capital controls. For instance, in a context of mid-level sophistication of this market, some administrative controls were adopted to close the loopholes found by private agents to circumvent the regulations aimed at curbing short term financial flows. The CARs could not be broader (what would guarantee their effectiveness according the literature summarized in section 2) as the maintenance of the macroeconomic regime depended on continuous capital inflows, yet of longer maturity in face of high external vulnerability.

In contrast, in the context of the new boom of capital flows towards emerging markets after the global financial crisis, specifically, during 2009-11, the Brazilian government gradually moved towards a macroeconomic strategy where preventing currency appreciation gained relevance alongside the priority of inflation stabilization under a macroeconomic regime featured by a dirty floating exchange rate and an inflation target policy. In order to untie the exchange rate and interest rate movements and achieve these aims in conditions of low external vulnerability, policy markers gave increasing relevance to CARs.

Yet, the new institutional features of the Brazilian financial market required the adoption of a more comprehensive set of CARs. This had to encompass not only capital controls on inflows (as in the 1990s), but also financial prudential regulations. Further, due to the key role of the FX derivatives markets in the

determination of the exchange rate, another class of regulation needed to be adopted, the FXDR. Hence, our analysis of the Brazilian case shows that the higher the degree of sophistication and financial openness of the domestic financial market, the higher the requirements for a more active and comprehensive regulation to reach the aims of the macroeconomic regime.

6. Conclusion

Following the plea from Dani Rodrik that we have to learn more about capital account regulation (CARs), in this paper we focus on the context these measures are adopted in. We argue that most literature until now has discussed technical aspects of CARs and their efficiency, overseeing their strong dependency on the broader economic setting of a country. Using the concept of macroeconomic regime, we bring to light firstly the interdependency between macroeconomic constraints and the macroeconomic regime, and between macroeconomic policy, the institutional framework and CARs. Indeed, the understanding of how these regulations are designed is keen to evaluate their performance and, hence, potential efficiency.

To test this, we chose to compare the regulation of capital flows within one country in two different periods, where at the technical level rather similar CARs were applied, but had different designs especially regarding aims and targets, due to strongly differing macroeconomic regimes and macroeconomic challenges. With the exchange rate playing the main role of inflation stabilization, for instance, stabilization of capital inflows has to be the major policy goal, so that CARs cannot aim at reducing these inflows. Even less regarded in the literature is the state of external vulnerability, which again strongly influences whether CARs can be oriented towards reducing the volume of inflows or only towards a lengthening of their maturities. The comparison of two periods in Brazil also demonstrates that institutional features of the financial market, mainly, its degree of sophistication and openness shape the specific tools to be put in place to achieve these aims.

This analytical framework on the design of CARs is an important complement of econometric studies on the effectiveness of CARs. We expect similar variables to be key for their design in other cases. To test for their robustness, however, further studies have to be undertaken, being it a research design of single case studies or comparative analysis among the group of emerging market countries. We leave this to future research.

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