

Instability of Capital Inflows and Financial Assets Returns in the Brazilian Economy

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Abstract

This paper compares different measures of Brazilian Country Risk from the end of 2009 to the beginning of 2012. These measures are derived: 1) from the spread of the internationally issued sovereign bonds interest rates over the U. S. Treasury Bonds rates of return; and, 2) from the residual difference between the expected domestic interest rates (SWAP DI-Pre) and the sum of the forward premium with an identically time-framed American interest rate. In the same period, an analysis of the financial flows dynamics using an ARCH modeling showed a significant increase in the volatility of the Foreign Direct Investments (FDI). This period coincided with: 1) an increase of the FDI flows, which surpassed the Portfolio Investments; 2) the existence of an embedded quasi-rent in the financial applications, associated with the high levels of domestic interest rates; 3) increases in the taxation (Financial Transaction Tax – IOF, in Brazil) of Portfolio Investments; and, 4) a profound decline in Portfolio Investments. Therefore, there is evidence of a regulatory arbitrage movement in the period, which can be explained by the existence of quasi-rents embedded in domestic interest rates. In other words, we found evidence of speculative capital inflows in the Brazilian economy disguised as FDI.

Resumo

Nesse artigo foram comparadas as medidas de risco-país do Brasil, no período do final de 2009 até início de 2012, derivadas: 1) do spread da taxa de juros dos títulos soberanos emitidos nos mercados internacionais sobre a taxa de remuneração dos T-Bonds; e, 2) do resíduo obtido a partir da diferença entre a taxa do SWAP DI Pré e a taxa de juros internacional acrescida do forward premium. No mesmo período, foi analisada a dinâmica dos fluxos financeiros constatando-se um aumento da volatilidade do Investimento Direto, a partir de uma modelagem ARCH. O período de aumento da volatilidade do Investimento Direto coincidiu com: 1) um aumento dos fluxos do Investimento Direto, ultrapassando o Investimento em Carteira; 2) a existência de uma quase-renda embutida nas aplicações financeiras associadas à taxa de juros doméstica; 3) aumentos na alíquotas do IOF incidente sobre os Investimentos em Carteira; e, 4) uma queda pronunciada dos Investimentos em Carteira. São encontrados, assim, indícios de um movimento de arbitragem regulatória incentivado pela existência da quase-renda, ou seja, a entrada de fluxos especulativos no país travestidos de Investimento Direto.

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I) Introduction

Since the mid-1990's, economic policy articulation, centered exclusively in inflationary repression, engendered a progressive frailty in the Brazilian economy fundamentals, with external vulnerability increase, slow output growth trend and accelerated expansion of the public debt. This macroeconomic arrangement was set upon a movement of financial domestic market opening associated with high internal interest rates in a period of abundant liquidity in the international financial markets. Its functionality derived from the persistent valorization of the exchange rate as a strategy to repress inflation. Therefore, by subordinating the economy overall performance to the growing necessity to attract foreign currency, this economic policy arrangement became dependable of the international capital flows dynamics; consequently amplifying the country external vulnerability.

From 2006 on, with the commodities price increase (caused by the growing Chinese demand) and the expansion in international liquidity, a sensible improvement was achieved in the Brazilian economy fundamentals: strong commercial balance surpluses, reserve accumulation and inflationary containment, favored by the exchange rate's appreciation trend. These conditions allowed a relatively fast economic recovery from the 2008 crisis, although associated with the maintenance of the previous macroeconomic arrangement, based on an absolute and relative high internal interest rate path.

In the conduction of the monetary policy, the Central Bank may, eventually set the internal interest rate at a slightly higher level than those prevailing in the international financial markets; higher, yet, than that required by the investors according to their perception of the risks involved in keeping external resources applied in domestic financial assets. This was the usual situation prevailing mainly in the post-crisis period (from the end of 2009 on), with high domestic and international interest rates differential. From the beginning of 2010 on, this situation led to higher dollar returns on Brazilian domestic treasury bonds than what would have been necessary to cover the country-risk component. The differential between internal and international interest rates was accompanied then by strong capital inflows. Notwithstanding, the Brazilian Central Bank (BCB) has been signaling changes in its line of action through systematic interest rate (SELIC) cuts since September 2011. This reduced the excessive returns in foreign currency (quasi-rents) to investors in domestic fixed income treasury bonds.

Theoretically, through capital flows movement, arbitrage should equalize the risk free dollar returns on assets between countries. Thus, the Brazilian interest rate should reflect the level of international rates plus the expected exchange rate devaluation and the country risk component. This last component can then be estimated residually, through its decomposition in several elements. Alternatively, the country risk can be inferred by decomposition of the external Brazilian bonds interest rates, according to secondary markets prices and expectations. Notice that this way both country risk measures should not be the same, and in case of systematic divergences between them, the supposed arbitrage mechanism would not be in place.

Within this framework, the paper analyzes the dynamics of domestic interest rates and the adequacy of capital control measures in the presence of international liquidity flows. Two interlinked lines of investigation are pointed out. The first one identifies the relationship between the domestic interest rate and its determinants according to the Covered Parity of Interests (CPI) arbitrage. The second one investigates the trend and volatility of foreign investments, stressing their dynamics under the impulse of monetary policy and the capital control measures in the Brazilian economy.

Therefore, the analysis in this paper highlights the capital movements in the post subprime crisis period (from the end of 2009 until the beginning of 2012) with focus on: i) the imposed capital controls by the Brazilian government, and ii) the perceived changes in the path of monetary policy.¹ Besides this introduction, it is organized as follows. Section II highlights some theoretical features of domestic interest rates determinants. Section III outlines the methodological aspects of country-risk measurement (in both ways mentioned above). Section IV analyzes the dynamics of the international investment flows,

¹ More precisely, the following path of the Selic interest rate: its stability, during the second half of 2009 and the first quarter of 2010; the systematic increases, from April 2010 to August 2011, and the subsequent decreases since then.

discussing the observed changes in their intensity, composition and volatility². Finally, the paper analyses the financial flows changes in two sub-periods, both of them characterized by more intensive capital control measures, but also by different levels of quasi-rents embedded in domestic interest rate.

II) Interest rate determinants in emerging market economies: theoretical aspects of capital liberalization

According to the rational expectation theory (with symmetric information among agents and perfect capital mobility in the global economy) the CPI is never violated; therefore, there will be no possibility of arbitrage gains in the markets. In other words, this reasoning implies that similar risky assets issued by different countries will have identical rate of returns, provided the discount of the expected exchange rate movements. Thus, comparing emerging market economies and those with a strong international currency, the following relation should prevail:

$$i = i^* + \text{expected exchange rate variation} \quad (1)$$

But the lack of arbitrage opportunities implied by (1) is not what can be actually observed in the world of financial markets, and this leaves us with two questions addressed below.

II.i) Exchange rate changes

The first question regards the influence of the expected exchange rate changes in domestic interest rates levels. These expectations can be measured through the difference between expected and spot dollar quotations in the exchange markets (future and current). Alternatively, they can be measured through the spread between the Swap interest rate DI-Pre and the Swap exchange rate DI-dollar (Garcia & Olivares, 2000 and Didier & Garcia, 2001). Besides, notice that the effect of the exchange movements in domestic interest rates comprises not only the expected devaluation rate but also its associated risk premium. Indeed, the spread between future and spot market values, from now referred to as Forward Premium (f), consist of the sum of both variables, i.e. the expected exchange rate devaluation and its associated risk premium. So, the relation (1) can be rewritten as follows:

$$i = i^* + f \quad (2)$$

II.ii) Bias of the Required Rate of Return

The second question is that bonds issued by emerging economies carry a positive bias regarding their required rate of return. This bias indicates that there is not perfect capital mobility among international markets, which impose a spread (the Country Risk: γ) in the required return of bonds issued by economies without strong international (convertible) currencies. Thus,

$$i = i^* + f + \gamma \quad (3)$$

According to (3), the Country Risk is a deviation from the CPI, as a result of the absence of external liabilities issued in local (national) currencies. Specifically, in the Brazilian economy case, some results of empiric studies highlight the existence of a positive correlation between the country risk and the exchange rate risk premiums (e.g. Garcia & Olivares, 2000).

One way of measuring the country risk of a specific emerging economy is to compare the current dollar rate of return of its external sovereign debt bonds with the American Treasury Bond (T-Bond) interest rate. Thus, the difference (γ^* , in p. p.) between such bonds rate of return (λ) and the T-Bonds (the safest bond in the international financial markets) interest rate (i^*) constitutes an indicator of the international investors lack of confidence in this specific country.

$$\gamma^* (\text{global}) = \lambda - i^* \quad (4)$$

This difference is conventionally expressed as Country Risk (spread over Treasury), and its most ordinary used indicator is the EMBI+ index, calculated by J.P. Morgan.

Alternatively, it is possible to measure the country risk in a specific emerging market, by discounting the international interest rate (i^*) and the forward premium (f) from its prevailing internal interest rate (Garcia & Didier, 2001). In this way, for the Brazilian specific case, we use in this paper the measure of the *residual* risk country given by the difference between the instantaneous expected annual

² Volatility changes are estimated through a GARCH model.

domestic interest rates (SWAP DI-Pre, 360 days) and the sum of the forward premium with an identically time-framed American interest rate. Therefore:

$$\gamma' \text{ (residual)} = i - (i^* + f) \quad (5)$$

So, if the Country Risk measures given by (4) γ^* and (5) γ' are similar, i.e. $\gamma^* \cong \gamma'$, the dollar rates of returns in domestic and international financial markets will be equivalent. But as mentioned above (Introduction), these two measures of Country Risk are not necessarily identical, and might even show systematic differences through time; and the higher the difference between the residual and the global risks, the bigger the attraction of direct capital inflows exerted by the domestic financial markets.

From this standpoint, the interest and exchange rates determination in emerging markets under the pressure of wide financial openness depends, essentially, on the exchange rate regime. If the fixed exchange rate regime prevails, there are interventions in the foreign exchange market through the use of international reserves, combined with adjustments in the domestic interest rates. This means that the domestic interest rate will be adjusted to levels sufficiently high to compensate for the country risk and the forward premium. This dynamic would be especially dominant and perverse in moments of large instability of the external financial markets.

On the other hand, under the flexible exchange rate regime, the policy making might be altered to some degree; yet, the monetary policy remains dependent upon the capital flows intensity. In this case, the external shocks are essentially absorbed through exchange rate fluctuations, and the path for domestic interest rate can be relatively more stable than what happens under the fixed exchange rate regime, and the monetary policy is able to target the inflation rate (even though it is not independent of the conditions imposed by the dynamics of capital flows).

From this standpoint, the high volatility showed by international capital flows in and out emerging economies can not be seen as the mere result of changing economic fundamentals. On the contrary, essentially, these movements contemplate speculative attacks related to changes in the monetary policy of the advanced economies and particular cycles and moments of the international liquidity (expansion or contraction). Besides, these speculative movements feed upon short-term factors such as the bubble contagion effects and the terms of eventual debt renegotiations. In this sense, the interest and exchange rates paths in emerging economies are continually influenced by the volatile dynamic of capital flows, even in the presence of strong economic fundamentals.

III) Quasi-rent in Brazilian Economy

III.i) Formulas

From previous considerations, and with the intent of evaluating the differences between the various existing country-risk measurements, the present subsection examines step by step the formulas involved in residual country-risk calculation. Thus, in the continuous specification of the CPI formula, the country risk is determined by the difference (spread) between the interest rates of sovereign bonds and that of the U.S. Treasury bonds with identical duration. The CPI might be expressed, therefore, as:

$$i = i^* + f + \gamma \quad (6)$$

Actually, equation (6) is already linearized (embodies logarithmic transformation). Our hypothesis is that, the respect of this condition requires the equivalence between Global Country Risk and the Residual Country Risk (γ' (residual)), which is determined as follows:

$$\gamma' \text{ (residual)} = i - (i^* + f) \quad (7)$$

The interest dollar rates of bonds traded in domestic markets ($i^{US\$}$), will be correspondent to

$$i^{US\$} = i - f \quad (8)$$

The Forward Premium (f) consists in the addition of the expected exchange rate devaluation with the associated *premium* risk (Garcia & Didier, 2001). So we can, alternatively, represent the Residual Risk as:

$$\gamma' \text{ (residual)} = i^{US\$} - i^* \quad (9)$$

Therefore, in case the Residual Country Risk magnitude surpasses the Global Country Risk, there will be an embedded quasi-rent in the domestic interest rates. That is to say,

$$\text{Quasi-rent} = \gamma' \text{ (residual)} - \gamma^* \text{ (global)} \quad (10)$$

III.ii) Risks and quasi-rent calculations

The specification of each variable, with the corresponding nomenclature, unit and source are summarized in Chart 1:

Chart 1

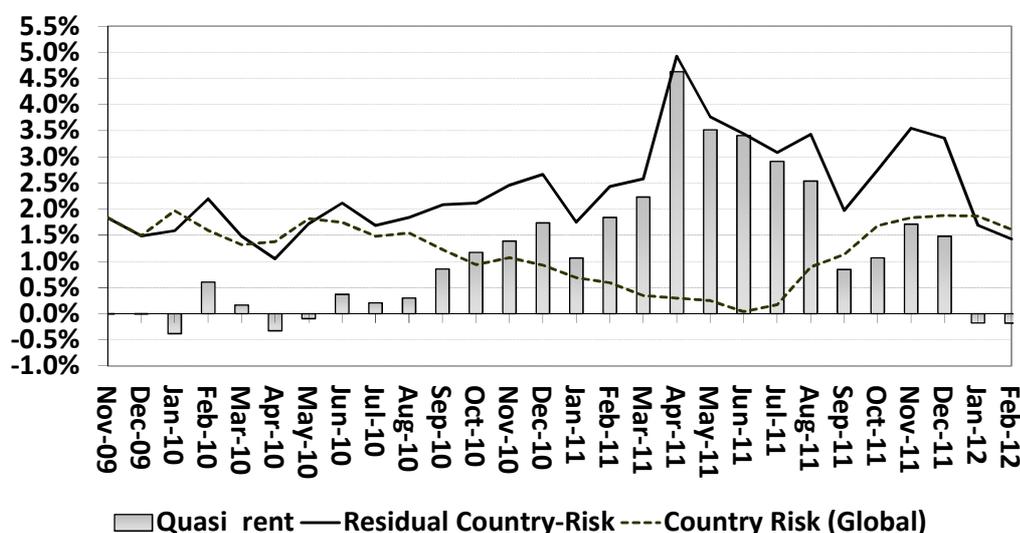
Variable	Acronym	Specification	Unit	Source
Domestic Interest Rate	i	Referential Swap-DI prefixed – 360 Days Term	% monthly annualized, end of the period.	Central do Bank of Brazil/BM&F Bovespa
International Interest Rates	i^*	U.S. Treasury Rate Constant Maturity (CMT) – 1 year	% monthly annualized, end of the period.	Board of Governors of The Federal Reserve System
(Global) Country Risk	γ^* (global)	Spread between Global 40 return rate and U.S. CMT rate (with equivalent maturity).	100 Base points from monthly rates % annualized at the end of period	Valor Econômico (Newspaper)/IPEADATA e Board of Governors of The Federal Reserve System
Forward Premium	f	Spread between 360 days future and spot dollar value	R\$/US\$ monthly, end of period	Central Bank of Brazil/BM&BOVESPA
Financial Flows	NPI, NDI, FDI, FPI	Net Direct Investment (NDI), Foreign Direct Investment (FDI), Net Portfolio Investments (NPI), Foreign Portfolio Investments (FPI)	Monthly US\$ millions	Central Bank of Brazil

The (Global) Country Risk measurement was derived by the decomposition of the Brazilian external debt bonds interest rate and corresponds to the Global-40 return rate spread over the CMT's (with equivalent maturity). This measurement was compared to the Country-Risk measured by the Brazil EMBI+ and both showed strong correlation (0,96 in the studied period).

Graph 1 presents the estimated trajectories of both the Global Country Risk (γ^*) and Residual Country Risk (γ) since November 2009. The graph bars represent the difference between its magnitudes. Notice that from June 2010 to August 2011, the revenue destined to cover the Residual Country Risk was situated systematically above the return rate demanded by investors in Brazilian Treasury bonds traded internationally. In other words, the recent trajectory of fixed income application revenue is a strong evidence of excessive returns to investors (a quasi-rent), whose amount is bigger than it is required by investors according to the risk perception involved in domestic applications with external resources.

Graph 1

Country-Risks differential and Quasi-rents



Source: Brazilian Central Bank, IPEADATA, BM&F Bovespa e Board of Governors of The Federal Reserve

Furthermore, through the sample correlation between both Country Risks series calculated in two sub-periods, different patterns can be observed. From November 2009 to August 2010, the series present positive correlation of (+) 0,43. However, from September 2010 to November 2011, a negative correlation of (-) 0,31 is observed.

Still, according to graph 1, notice that in the first period the Residual Risk measurement accompanied (or was accompanied by) the Global Country Risk measurement. This means that monetary policy implemented in this period went along with investors risk perception involved in Brazilian government bonds operations.

On the other hand, from September 2010 on, both Country Risk measurements began to diverge systematically, increasing the net return margins, until April 2011. This difference explains, to large extent, the strong capital flows to Brazil in that period, as will be discussed in the second part of this text. However, since September 2011, there have been noticeable changes in the path of monetary policy, involving consecutive decreases of SELIC rate by the Central Bank of Brazil, and, consequently, in the spread between internal and international interest rates. Thus, the returns observed in domestic financial assets have become more compatible with the returns embedded in Brazilian bonds traded internationally.

IV) Capital Inflow Instability and Regulatory Arbitrage

From the end of 2008 until the beginning of 2009, the Balance of Payments registered consecutive monthly deficits as result of international financial crisis. From September 2009 on the Balance of Payments presented monthly surplus trajectory. The current account deficits were financed by capital inflows, in the form of direct and portfolio investments. A combination of factors explains the huge influx of capital registered during this period. Amongst these factors, the most relevant ones were: 1) high domestic aggregate demand growth rates, comparing to the advanced economies ones. leading output growth rates to surpass those of the central countries; 2) high levels of government bond interest rate and its spread over the internationally practiced rates; 3) abundant liquidity in the international financial markets; 4) national financial market enlargement process (more liquid and deeper); and, last but not least, an expressive increase in commodity prices (which increased stock investments in commodity export oriented companies).

The government, that had timidly began, in March 2008, a capital inflow control policy, through the stipulation of a Financial Transaction Tax (in Brazil, IOF), adopted new measures in October 2009, elevating this tax's rate. The rate magnitude (2% over transactions on the capital and financial markets), however, was not enough to prevent a growing inflow of Portfolio Investments.

The massive inflow of dollars in the Brazilian economy, and the consequent exchange rate appreciation led the government to intensify the capital control policy, tripling the IOF (to 6 %) over bond applications and external loans of up to two years terms, and for 2 % in the case of stocks (See Annex 1 for details of all measures adopted from 2008 until the end of 2012). Despite the measures, in November of 2010, a new phase of significant growth of the Balance of Payments surplus took place, this time determined by an ascendant trajectory of the net direct investments. Two qualitative changes in the flow's composition, can be observed: i) change in the indebtedness profile, extending the debt maturity (related to bonds put in the foreign market and bank loans), especially of banks; and ii) an overtaking of net direct investments participation in the financial account over portfolio investments.

Although the first change represents an improvement in the external indebtedness profile, discouraging a significant increase in private sector external borrowing was not enough. Between December 2010 and February 2012, external private debt³ went from US\$ 187.2 billion to US\$ 238.4 billion, a 27.3% rate of variation. From the total external private debt in February, 58.6% corresponded to bank debts, as a result of a 35.4% growth since December 2010. Since these external borrowings were not subject to reserve requirements, it became an alternative way to expand internal credit, diminishing the effectiveness of the macro-prudential measures. This process of private indebtedness in dollars can be considered a type of external vulnerability, since it implies higher exposure of the private sector to a swift

³ The external debt was calculated as follows: Private External Debt = Total External Debt (including intercompany loans) – General Government External Debt – Monetary Authority Debt.

change in the international financial market expectations⁴. As an example of what occurred in the 1970's, the risk is to Monetary Authority having to undertake private indebtedness penalizing the whole economy from a wrong financial strategy of few.⁵ This first change, however, is not our main focus in this paper, and we'll leave this analysis to further works.

Our focus is on the second query mentioned above. The relative increase of net direct investments in the balance of payments financial account composition represents, at first sight, an improvement in current account financing profile. Supposedly the Foreign Direct Investment inflow was a result of the good perspectives of Brazilian economy performance relatively to advanced economies growth, which were still recovering from the 2008 financial crisis. However, this explanation does not seem to be enough to justify the massive external resources inflow observed in 2011. The high internal and external interest rate differential, and consequent valuation of the domestic currency, favors regulatory arbitrage of those flows and, therefore, leads to speculative capital inflow, under the rubric FDI.

At this point, it is important to explore the meaning of the Direct Investment (from now on, DI) rubric in Brazil. The Direct Investment corresponds to the sum of Foreign Direct Investment (FDI) and the Brazilian DI abroad (BDI). Each one contains a component related to acquisition/alienation of equity capital and also a component that registers claims/liabilities of intercompany loans (for a detailed description, see Annex 2). In the following, this paper ranks a few reflections concerning those flows. Although the merit of the greenfield component of direct investments cannot be discarded, these reflections raise some doubts about the viewpoint that addresses direct investment as synonyms of capital flow "quality".

As regards equity capital, FDI can be destined to simple fusion or acquisition of an existing Brazilian company, which corresponds only to an exchange of property, not generating necessarily any gains in terms of incorporation of new technologies, or increasing productive capacity, with the additional onus for the Brazilian economy of having the future remittance of profits and dividends as counterpart.

To put it in a longer term perspective, it is true that this kind of operations lost importance among Brazilian DI flows. UNCTAD numbers show that the participation of fusions and acquisitions in FDI has diminished substantially in the 2000 decade, in comparison to the 1990's, when most of the FDI was destined to the Brazilian privatization program⁶.

Furthermore, the criteria to classify financial flows by the Brazilian Central Bank leaves a door open to an overestimation of FDI values. Following international classification, the requirement for registering an investment as FDI is a minimum of 10 per cent of the voting shares or voting power ownership of an enterprise by fusion, acquisition, or equity capital increase. Thus, nothing prevents, for instance, the purchase of 11% of the voting shares through FDI from being easily liquidated subsequently, which does not fit the long-term entrepreneurial commitment that FDI should stand for. This classification is also criticized by Jan Kregel:

"In first place, consider the distinction between portfolio investments and direct investments. The distinction was created, initially, so that the internal and foreign control over productive assets could be differentiated. (...) Concerns of this nature were common in Europe during the 1960's. But they are very different from developing countries current concerns. Official FDI definitions therefore have nothing to do with its permanence, mobility or volatility. Actually, they seem to ignore how easily developed country investors assume and abandon companies' control through fusion and acquisition. In current financial markets, companies seem to have been converted in commodities, daily traded in equity markets".

(Kregel, 2004, p. 39)

⁴ See Araujo and Gentil (2011).

⁵ See Cruz (1984) to an analysis about the private sector indebtedness process in the 1970's, see Cruz (1984).

⁶ It is also important to notice that the DI attraction movement was not restrained to Brazil, but was widespread amongst developing countries. As a matter of fact, from 2008 on, direct investments in developing countries begin to surpass investment in developed ones (World Investment Report; UNCTAD, several issues).

Another movement that might take place, in the absence of an inspection of these resources destinies after their admission, is the possibility of opening a new public limited liability company by the foreign investor, followed by the redirection of this investment, through treasury operations, to a Brazilian financial investment fund. Such financial funds are exempt from taxes over portfolio investment inflows. This movement does not configure a strong and lasting commitment of the foreign capital to that particular company, but it is classified as FDI.

It is worth noting that even greenfield investments, defined as flows destined to finance new investment projects, naturally have as counterpart the remittance of future profits and dividends. The economic rationality suggests that the (expected) profit rate embedded in these remittances should exceed the interest rate obtained in strictly financial activities, as a reward to what Adam Smith called “risk and trouble” of the productive activity. Thus, it may happen that the FDI income leads to a foreign currency outflow even bigger than those associated with the FPI.

Kregel (2004) argues that although FDI is not directly linked to the charge of fixed interest rates denominated in foreign currencies, or determined by an international rate formed in the international capital market, it does not mean that exchange rate and funding risks are ignored by investors. In fact they appeal to the same hedging mechanisms that the speculative investors do. Besides, the premium risk incorporated to the FDI loan returns will be even bigger than those from the portfolio investments.⁷

The intercompany loans, in turn, may be used to finance new investment projects, working capital or constitute merely a channel for speculation with financial assets in different currencies.

The proposition that entrepreneurs, investors and speculators, because of the maximization of profit goal, periodically find new ways to bypass the existing regulation norms in capitalism economies was explored by Hyman Minsky throughout his study (e.g., Minsky, 1986).

As to the effectiveness of the capital flow control measures, the existing literature explores the case of Russia, Asia and Latin American countries during the 1990's, a period characterized by strong capital flow instability and by a sequel of financial crisis involving these countries. Specifically for the Brazilian case, Cardoso & Goldfajn (1997) point out to the temporary effectiveness of capital controls (impacting the level and composition of capital flows in the short term), but argue that, in the long term, this measures are ineffective. Through econometric tests (impulse response functions), Carvalho & Garcia (2006) also argue that capital controls would be effective in Brazil only for short periods, from two to six months. In a broader temporal horizon, investors use complex financial instruments to circumvent current legislation regarding external capitals. Incorporating more recent data, Munhoz (2011) analyzes the effectiveness of the financial investment tax (IOF) changes from 1995 until 2010 through VAR modeling, concluding that portfolio investments in Brazil react with little intensity to small tax changes.

On the other hand, Epstein, Grabel and Jomo (2003) study the experience of several different types of capital flow administration measures found in seven countries during the 1990 decade, including Chile, Colombia, Taiwan, India, China, Singapore and Malaysia. They conclude that these were successful experiences, which allowed those economies to reach desirable macroeconomic goals. Besides that, authors advocate for dynamic regulation, in the sense that they should be modified, strengthened and adjusted according to shifts in the economic outlook, identification of vulnerabilities and investors attempts to bypass existing measures. IMF staff economists have also sided with those in favor of capital control (Ostry et al, 2010).

It is important to underline the differences between the 1990's and the 2000's in Brazilian economy regarding capital flows. The beginning of the 1990 decade was marked by the end of a long period of Brazilian external debt bonds renegotiation, so the following years constituted a transition to confidence restoration by external investors in Brazilian economy. To a certain degree, the high level of internal and external interest rates differential was directly related to assets' pricing risk evaluation difficulties, of an economy going through a monetary stabilization process, within a context of reducing commercial barriers and removing any regulation obstacles to free capital flows.

⁷ This citation is translated to English by the authors from a Portuguese version of Kregel's article.

The debate regarding capital controls in the 1990's was directed to the risks and dangers of capital departures. At that moment, Brazilian economy's structural external vulnerability was explicit and capital outflows would lead to a Balance of Payment and then exchange rate crisis, which could boost inflation rates. The inflation threat would call for contractionist policies, delineating a stagflation outlook. Indeed, working with VEC models and VAR methodology instruments, Biage, Correa & Dantas (2008) established that, in the 1990's, after monetary stability, internal macroeconomic variables dynamic were conditioned by capital flows movements.

The 2000 decade (especially after 2004) is a complete different scenario, characterized by a monetary, political and institutional stability consolidation and a further improvement on the relationship between external investors and the country. These years are marked by a relief to the output growth restrictions imposed by the Balance of Payments, due to, to a great extent, the China effect, that boosted Brazilian commercial surpluses through exports increases. This current account recovery allowed internal market growth, strongly stimulated by fiscal policies, not only income transfer and redistribution ones, but also those that allowed labor income recovery. This growth, linked to the great differential of internal and external interest rates led to a strong inflow of capital. The exchange rate began, then, to undergo a process of appreciation.

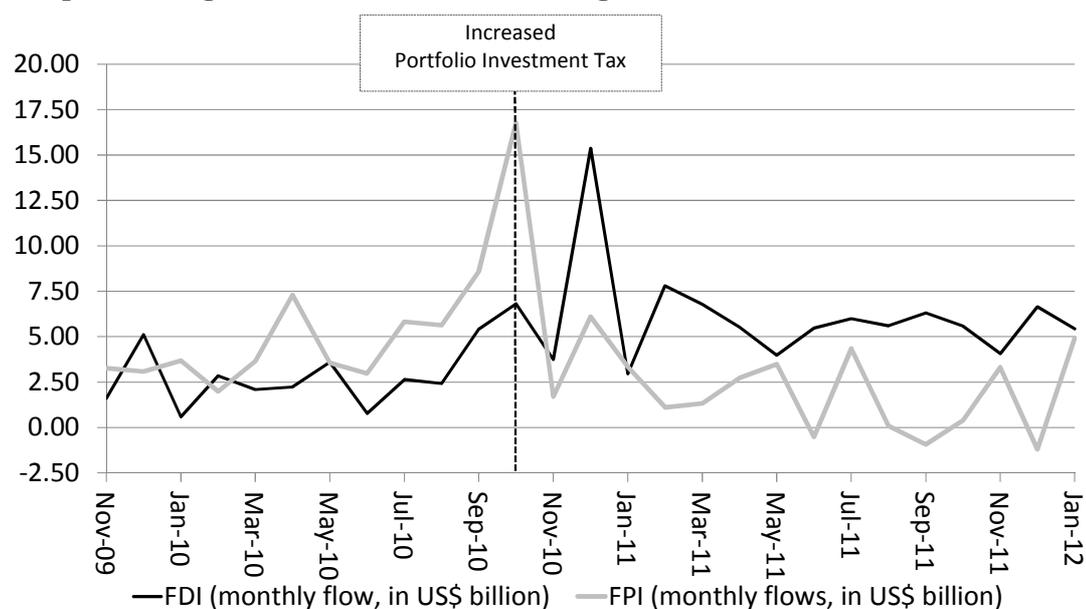
In this period, the debate regarding capital control centered on capital entrance (and not on its departure) and the threat of the Brazilian currency overvaluation, with undesirable consequences to the Brazilian manufacturing industry' market share. Also according to Biage, Correa, & Dantas (2008), after the adoption of floating exchange rate regime, in 1999 (up to 2006), capital flows importance diminished in the determination of internal macroeconomics variables, but they kept influent in the exchange rate composition. The results also point to a strongly exogenous SELIC rate behavior, corroborating the analysis explored in section II of this paper of the existence of a quasi-rent embed in government bonds prices in the 2000's.

In the following sections, we'll explore some evidence of regulatory arbitrage with FDI, raising suspicions of Portfolio Investment inflows under the Direct Investments label. We call this maneuver of regulatory arbitrage, as a reaction by foreign investors to macro prudential measures adopted by the BCB in this period to prevent short-term speculative capital inflows of the country. Our analysis is focused on the period between 2010 and 2012, when the capital control measures were intensified (see annex 1 for a list of all those measures).

IV.i) Investment tendencies

As mentioned before, from the second half of 2010 on, the portfolio investment flows reached a hike, leading the government to intensify the exchange rate protection measures that had been initiated in 2008. These measures' impacted Net Portfolio Investments (NPI), which started to register a downward trajectory from November 2010 on. On the other hand, the Net Direct Investments (NDI), which since August 2010 showed growing values, exceeded, in November 2010, the NPI monthly flows, and started presenting a more accelerated growing trajectory.

Graph 2: Foreign Direct Investment and Foreign Portfolio Investment flows



Source: Brazilian Central Bank. Elaborated by the authors.

IV.i.i) Foreign Direct Investment

As we've seen, the increase in FDI inflow growth speed occurred right after the adoption of measures aiming to avoid capital over flow. We separated then the FDI according to its two main components: equity capital and intercompany loans. Moreover, we opted to work with the gross flows, analyzing separately credits and debits of each of the previous components as well. We opted here for examining the first half of 2011, period that followed the establishment of the capital control measures.

The data analysis allowed us to conclude that: in first place, the net FDI level increase was caused both by equity capital credits and intercompany loan credits (Table 1).

Table 1
Foreign Direct Investments

	1 st half/2010	1 st half/2011	Variation Rate (%)
	US\$ million		
Equity Capital Entrance	18 151	32 170	77
Equity Capital Exit	5 895	6 343	8
Intercompany Loans Revenue	7 912	17 310	119
Intercompany Loans Expenses	8 072	10 660	32

Source: Brazilian Central Bank.

According to previous analysis and against the regulatory arbitrage hypothesis, three arguments may be listed. In first place, FDI credit and debit flows do not necessarily mean purchase and sale of equity capital by the same investor. Increases in the equity capital credit or debit flows may be occasioned by a sale from a foreign controller to another. This is a question that cannot be answered because BCB does not make public disaggregated data which would allow us to identify if the increase in the FDI flows resulted (or not) from shifts in companies ownership from a foreigner to another.

The second argument against the regulatory hypothesis is based on the fact that short term intercompany loans (within a 720 day term) were also under IOF tax. Here again there is a lack of public information about the maturity of these loans. The problem is that during the period chosen for this

investigation medium and long term loans (those whose maturity exceeded two years) were free from IOF tax⁸.

In third place, assuming that the higher the operation value, the higher the direct investor commitment to the direct investment enterprise, the third argument against the hypothesis of the “speculative FDI” refers to the volume of inward FDI in the first half of 2011. It is true that, stronger variations were found not amongst small size operations, but in the larger ones. As indicated in Table 2, in the half of 2011, right after the intensification of the IOF increase policy, larger volume operations were the ones that registered more significant growth rates, especially those between US\$ 500 million and US\$ 1 billion, with a 233% growth over the first half of 2010.

Table 2

Foreign Direct Investments

per value

Value	1 st half/2010	1 st half/2011	Variation Rate (%)
	US\$ million		
Operations lower than or equal to US\$ 10 million	2 746	3 956	44
Operations between US\$10 million and US\$20 million	1 280	1 687	32
Operations between US\$10 million and US\$50 million	2 471	3 251	32
Operations between US\$50 million and US\$100 million	1 777	3 391	91
Operations between US\$100 million and US\$500 million	3 762	6 251	66
Operations between US\$500 million and US\$1 billion	1 372	4 563	233
Operations beyond US\$1 billion	4 743	9 071	91
Total	18 151	32 170	77

Source: Brazilian Central Bank. Elaborated by the authors.

Notwithstanding, according to this table, there was also a strong growth in operations under US\$ 10 million volume (44% variation from first half of 2011 over the first half of 2010). Therefore, two simultaneous movements in foreign direct capital inflows can be observed: big investment inwards aiming a long-term relationship with an enterprise, and leading to the obligation of sending off future profits and dividends, and also, a significant volume of short term investment to speculative purposes.

IV.i.ii) Brazilian Direct Investment

On the other hand, direct investment rubric investigation reveals an unusual fact. From January to June 2011, DI summed US\$ 42 billion, while FDI summed US\$ 32 billion. This apparent puzzle is explained by the Brazilian Direct Investments abroad (BDI) movements. As shown in annex 2, the DI equals the FDI minus BDI. At first, it would be expected that the BDI to be composed mainly by capital outflows deriving from Brazilian companies’ internationalization movement⁹.

In the first half of 2011, there was a positive inward in Brazilian direct investments abroad due to: i) subsidiaries loans to Brazilian head offices, that added up to US\$ 4 billion, with a 155% variation between January and June 2011 over the same period in the previous year; and ii) claims amortizations received by Brazilian head offices, related to loans (allegedly) granted to their foreign subsidiaries in the past. These amortizations summed up US\$ 14 billion in the first half of 2011, in a 179% growth over the same period from the previous year (Table 3). These flows were strong enough to make BDI an additional source for capital inward in the first half of 2011, amounting to US\$ 10 billion, while the BDI in the first half of 2010 had accumulated an US\$ 8,8 billion negative flow¹⁰.

⁸ In February 2012, the Brazilian government increased these loans’ terms from 2 to 3 years, and right after to 5 years, in recognition of regulatory arbitrage possibilities in intercompany loans.

⁹ The puzzle also occurred in 2009 since the net BDI was also positive, due to amortizations received by the Brazilian head offices from their subsidiaries abroad as a result of previously liabilities. This movement can also be justified as a response to the international crisis but there’s no guarantee there were not already in that year a speculative component, as a result of the bypassing the IOF taxing regulation that began in 2008.

¹⁰ For an evaluation of the magnitude of those numbers, we compared the volume of loans sent by Brazilian companies to its units abroad with the amortizations received, since the beginning of such operations’ registration. IFrom January 1999 until

Table 3
Intercompany Loans (Brazilian Investments Abroad)

	US\$ million								
	Total			From Brazilian Head Office to Abroad Subsidiary			From foreign Head Office to Brazilian Subsidiary		
	Credit	Debt	Net	Received Amortization	Granted Disbursement	Net	Entry	Paid Amortization	Net
1 st half/2010	6734	-3505	3229	5136	-971	4164	1598	-2534	-936
1 st half/2011	18398	-1240	17158	14315	-396	13919	4083	-844	3239
Variation Rate (%)	173			179			155		

Source: Brazilian Central Bank.

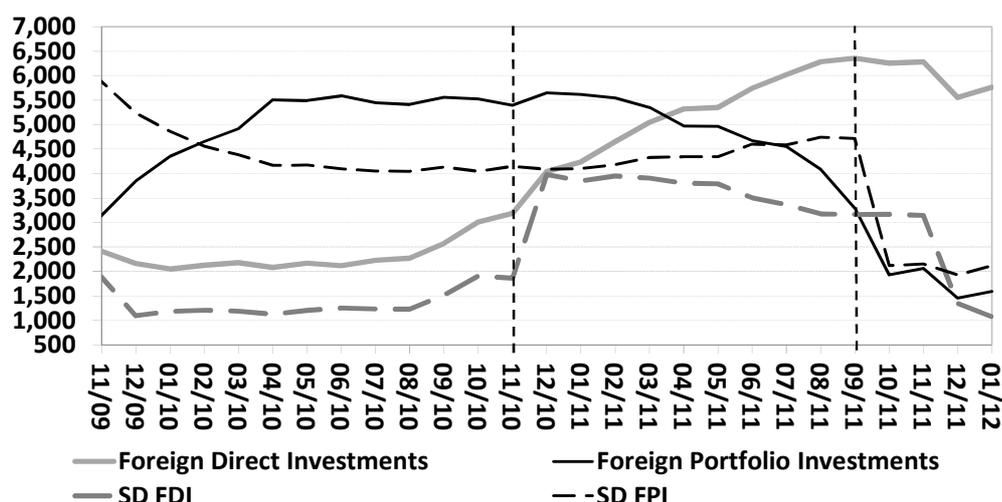
IV.ii) Foreign Investments Volatility

Another evidence of the regulatory arbitrage hypothesis may be found through analyzing the direct and portfolio investments' volatility. Graph 5 shows that the change of the FDI path, which started by the end of 2010, occurred simultaneously with an upward shift in its sample standard value deviation (SD).

Graph 4 shows the evolution of the 12 month moving averages FDI and portfolio investment flows, with the respective sample standard deviations. Since it is aimed to short-term financial gains, in Brazil, portfolio investments is typically characterized by a higher volatility (see Munhoz and Correa, 2009). However, we can also see that the upward shifts in FDI sample standard deviation from November 2010 on, approaching the portfolio investments volatility, transformed direct investment nature. The recent upward shifts in the FDI sample standard deviation constitute an additional sign of effective inflow of portfolio investments under the label of direct investment.

Graph 3

Foreign Direct Investment and Foreign Portfolio Investments associated standard deviations (12 months average flows, in US\$ billion)



Source: Brazilian Central Bank. Elaborated by the authors.

June 2011, granted loans summed up US\$ 49,9 billion, while received amortizations summed up US\$ 56,8 billion. This means that the loans were surpassed by the respective amortizations in US\$ 6,9 billion. It's worth to remember that the intercompany loans interest rates are computed separately in the Balance of Payment Income account.

IV.ii.i) GARCH modeling¹¹

Standard value deviations motivated the use of time series instruments to formally model the FDI and the FPI series' volatilities. We adopt the methodology suggested by Munhoz and Correa (2009), based on an econometric model specifically designed for time series – Autoregressive Conditional Heteroscedasticity (ARCH). The authors estimate the financial account annual flow's volatility from 1999 until 2005 in four opening levels, modeling a total of 50 series. The results found show that portfolio investment flows' volatility is higher than that of the net FDI.

Following this methodology, we updated the models do the specific case of net FDI and net FPI series from December 1999 until February 2012¹². In the FPI case, all the unit root tests point to a rejection of the unit root. This result is confirmed by the analysis of the series correlogram. In the case of the FDI series, tests show contradictory results, at 1% significance, the Phillips Peron points to unit root existence, while Augmented Dickey Fuller and Kwiatkowski–Phillips–Schmidt–Shin (KPSS) point to its non-existence. The correlogram analysis shows persistence in autocorrelations until lag 12. We observed a change in the series dynamic from 2006 on, presenting an ever more unstable behavior and a larger growth trend which could be characterized as a structural change, compromising unit root test results. Thus, we divided the sample in a sub-period and also tested unit root for this sub-sample. Test results remained not conclusive to FDI series. To deal with that problem we worked with two modeling alternatives to the FDI in the ARCH modeling; one for the original series and other for its first difference.

Table 4

Unit Root Tests

	FDI		FPI	
	1999-2012	2003-2012	1999-2012	2003-2012
ADF (p-value)	0.04	0.18	0.00 *	0.00 *
PP (p-value)	0.00 *	0.00 *	0.00 *	0.00 *
KPSS (statistic)	0.75 **	0.91 **	0.68	0.46

* indicates rejection of the unit root hypothesis (at 1% significance)

** indicate rejection of the stationarity hypothesis (at 1% significance)

The KPSS critical value of statistical distribution is 0,74 (at 1% significance).

The econometric modeling strategy was the elaboration of ARMA models for the residual volatility analysis. The correlograms suggest AR(3)ar^s(1) models both to the FPI (Table 5) and to the FDI (Table 6).

¹¹ All graphs and tables contained in this section and the following were elaborated by results obtained by calculations and estimations made by the authors, based on data sources described in Chart 1.

¹² Although our analysis focuses on the period between the subprime crisis and 2012, it was necessary to adopt samples back to 1999, period compatible with a floating exchange rate regime, to reach enough degrees of freedom necessary to robustness of estimations.

Table 5

Dependent Variable: FPI
 Method: Least Squares
 Sample (adjusted): 1999M01 2012M01
 Convergence achieved after 4 iterations

Variable	Coefficient	Prob.
C	1,450.969	0.177
AR(1)	0.281	0.001
AR(2)	0.267	0.001
AR(3)	0.126	0.118
AR(12)	0.126	0.056

R-squared 0.32
 Adjusted R-squared 0.30
 Prob(F-statistic) 0.00

Breusch-Godfrey Serial Correlation LM Test:

Prob. F(2,150) 0.61
 Prob. Chi-Square(2) 0.60
 Durbin-Watson stat 1.98

Heteroskedasticity Test: ARCH

Prob. F(1,155) 0.09
 Prob. Chi-Square(1) 0.09

Table 6

Dependent Variable: FDI
 Method: Least Squares
 Sample (adjusted): 1999M01 2012M01
 Convergence achieved after 4 iterations

Variable	Coefficient	Prob.
C	3,018.8	0.007
AR(1)	0.103	0.183
AR(2)	0.330	0.000
AR(3)	0.242	0.003
AR(12)	0.185	0.018

R-squared 0.34
 Adjusted R-squared 0.32
 Prob(F-statistic) 0.00

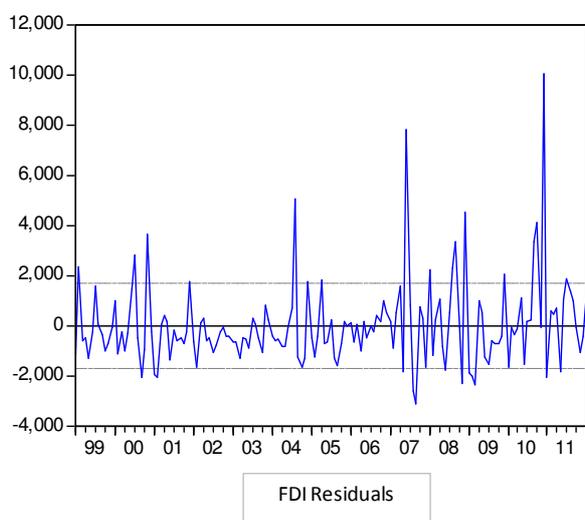
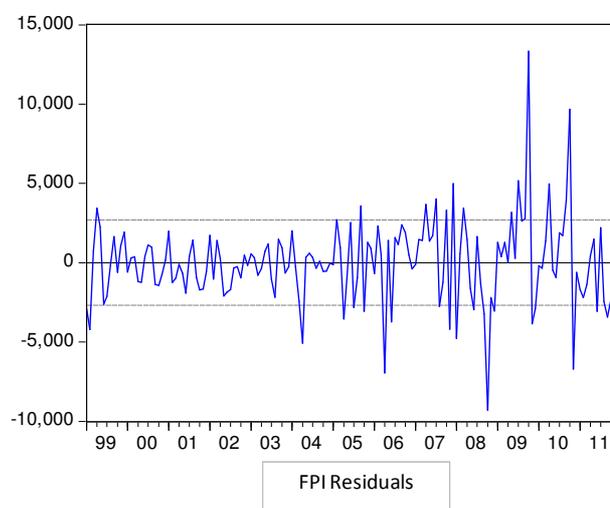
Breusch-Godfrey Serial Correlation LM Test:

Prob. F(2,150) 0.27
 Prob. Chi-Square(2) 0.25
 Durbin-Watson stat 1.98

Heteroskedasticity Test: ARCH

Prob. F(1,155) 0.88
 Prob. Chi-Square(1) 0.88

In both models, the LM Breusch-Godfrey test points to the absence of correlation between the residuals. In the FPI case, the ARCH test results points to the rejection of the null constant over time conditioned variance hypothesis, indicating presence of ARCH effect. In the FDI case, the test points to non-rejection of the ARCH effect. However, a graphic analysis of the model residuals suggests a change in the series volatility, indicating more volatile series from 2007 on.

Graph 4**Graph 5**

Then a GARCH (Generalized Autoregressive Conditional Heteroscedasticity) modeling was carried out, with GARCH specifications, of GARCH (2.1) to FPI series and GARCH (1.0) to FDI series (table 7). In the FDI case, the estimations point to non-stationarity of the associated ARMA process. Thus, another model was built: the alternative was a GARCH (1,0) model for the FDI in its first difference (Table 8)¹³ The conditional expectation equation were rearranged according to the coefficient's significance indicated by t-student test.

Residuals did not present autocorrelation. In the same way, no remaining ARCH effect was detected by the hypothesis tests.

Table 7

Dependent Variable: FPI
ML - ARCH
Sample (adjusted): 1999M01 2012M01
Convergence achieved after 15 iterations
Presample variance: backcast (parameter = 0.7)

Variable	Coefficient	Prob.
C	788.76	0.18
AR(1)	0.22	0.01
AR(2)	0.13	0.09
AR(3)	0.17	0.01
AR(12)	0.16	0.01

Variance Equation

	Coefficient	Prob.
C	7041561.00	0.00
RESID(-1)^2	0.71	0.00
RESID(-2)^2	0.60	0.00
GARCH(-1)	-0.88	0.00

R-squared	0.29
Adjusted R-squared	0.25
Prob(F-statistic)	0.00

Table 8

Dependent Variable: first difference (FDI)
ML - ARCH
Sample (adjusted): 1999M01 2012M01
Convergence achieved after 162 iterations
MA Backcast: 1998M01 1998M12
Presample variance: backcast (parameter = 0.7)

Variable	Coefficient	Prob.
C	70.92	0.30
MA(1)	-0.39	0.00
MA(12)	0.13	0.01

Variance Equation

	Coefficient	Prob.
C	1001049.0	0.00
RESID(-1)^2	0.989	0.00

R-squared	0.34
Adjusted R-squared	0.32
Prob(F-statistic)	0.00

IV.ii.ii) FDI and FPI volatility graphical analysis

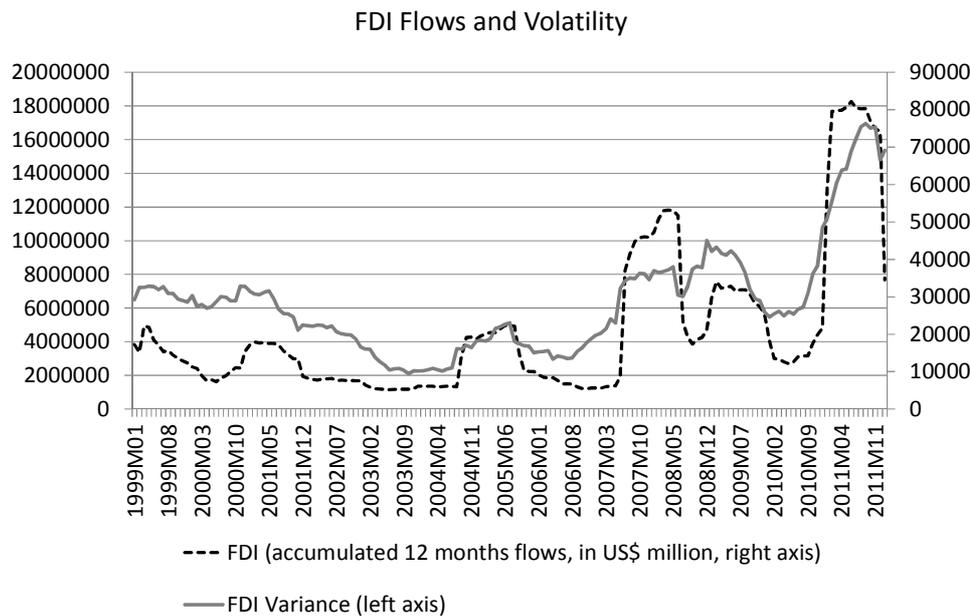
In the following graph, it's possible to observe that volatility levels intensely increased in the period preceding the world financial crisis, when there was an abundant liquidity situation in the international markets. This volatility suffered from retraction during the crisis, between December 2008 and January 2010, when there was substantial reduction in FDI inflows to the country.

Indeed, from December 2010 on, there is new and more significant volatility increase, followed by a higher FDI inflow. This recent conditional variance increase obtained through GARCH models corroborates the results obtained by the descriptive sample deviation calculus. Graph 5 shows the variance dynamics on the left axis and the FDI series on the right one. We notice a positive correlation

¹³ FDI series variance estimated both by GARCH models applied to original series as for the first differenced series, are extremely alike, adding up to a robustness of the results.

between volatility and the FDI trend, so that periods of higher FDI inflow were also those of higher volatility.

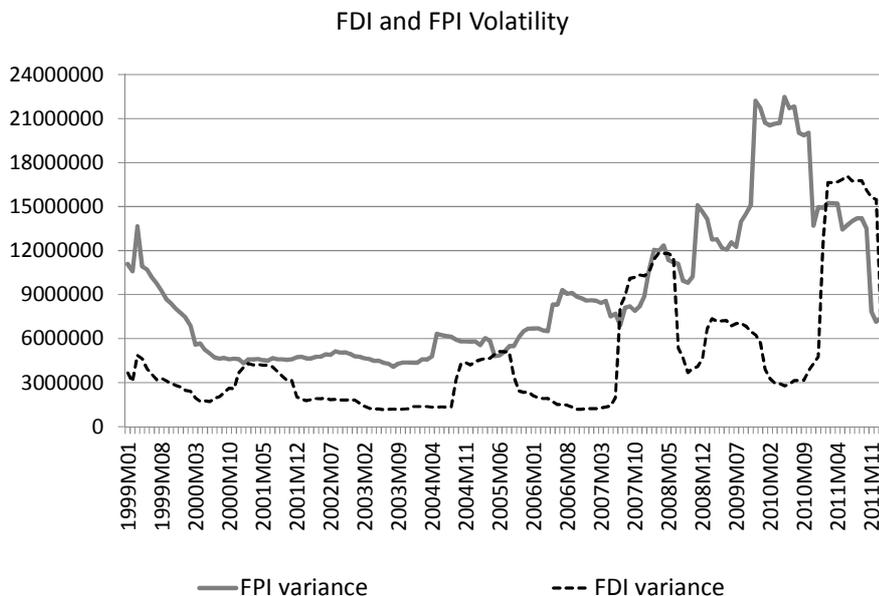
Graph 6



* Datasets were smoothed by the 12 months moving average.

In Graph 6 we see all FDI and FPI variance series, showing that, as a general rule, FPI volatility is higher than FDI volatility, corroborating Munhoz and Corrêa (2009)’s results that high volatility is a property of short-term flows, of speculative nature. We also observed that from the end of 2010 throughout 2011, FDI flows’ volatility increased. The raise in FDI flow associated with a higher volatility is an evidence of the validity of the regulatory arbitrage hypothesis.

Graph 7¹⁴

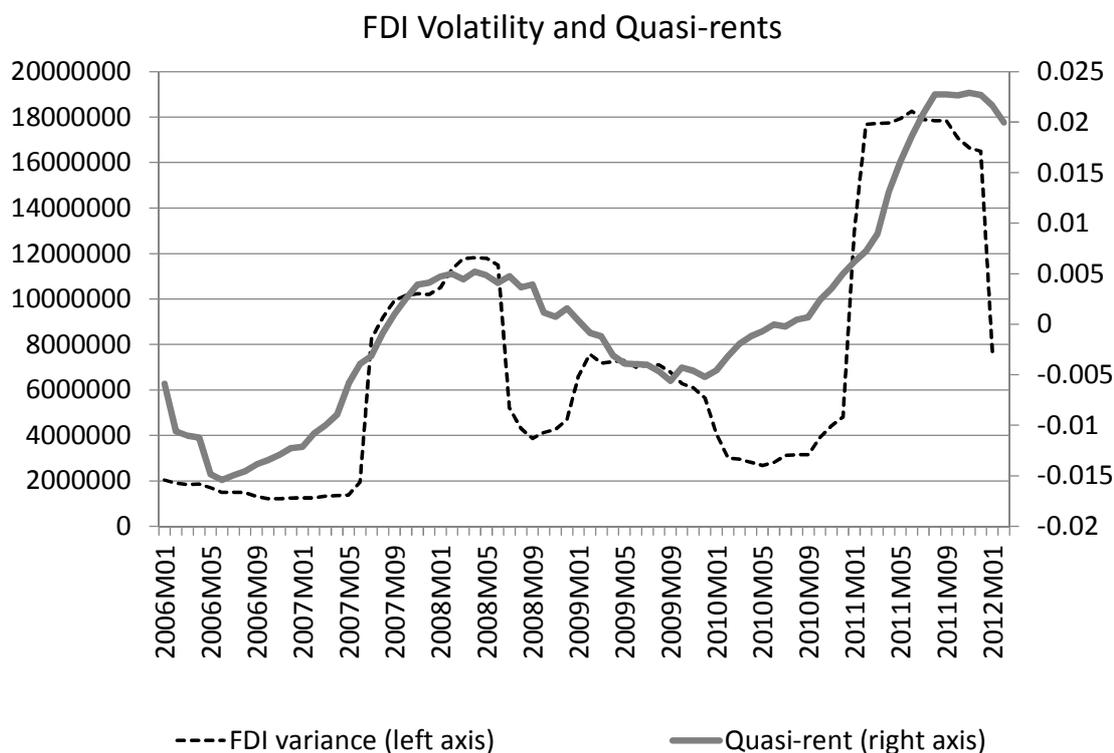


* Datasets were smoothed by the 12 months moving average.

¹⁴ Comparison between these two variance levels must be seen with some cautions, once they’re estimated by GARCH models with different specifications. Nevertheless, they were graphed on the same axis to allow comparison in the dynamics of each one.

Graph 7 shows the variance dynamics of quasi-rent and FDI, indicating a common trend between those series. The correlation coefficient between both series from 2006 to 2011 equals 0.8.

Graph 8



* Os dados foram suavizados pela média móvel 12 meses

IV.iii) Sub-period of the relation between quasi-rents, IOF and Financial Flows

For the purpose of analyzing the government measures impact over the evolution of these financial flows, the period between November 2010 and October 2011 might be divided in two sub-periods.

The first sub-period begins in November 2010 and ends in August 2011. In this period the monetary policy management was marked by the adoption of taxes over the portfolio investment inflows and also by a high level of quasi-rent (Graph 1), due to consecutive SELIC rate increases from January 2011 on. The combination of these both measures led to two sets of change in the financial account capital inflows: 1) reduction in the NPI ingress and significant increase of the NDI flows, the latter more than compensating the decrease of the first, leading to increasing surpluses on the Balance of Payment; 2) the entries of FDI were accompanied by increase in the descriptive sample standard deviation, approaching the standard deviation of Portfolio Investments; 3) Increase of the FDI volatility, as measured through the GARCH modeling; 4) reduction of the NPI volatility as measured by the GARCH modeling.

The second period begins in September 2011, when there was a significant reduction in the NPI flows, least than compensated by the FDI flows increase, which then led to two consecutive falls on the Balance of Payments. This movement coincided (non-coincidentally) with a shift of direction in the BCB's monetary policy conduction. (beginning of the SELIC rate reduction cycle) resulting in quasi-rents reduction. Thus, in this second period, the following movements can be detected: 1) more intense reduction of NPI flows; 2) slowdown in the growth rate of NDI flows; 3) balance of payments surplus reductions, although still significantly higher than zero levels; 4) FDI inflows volatility reduction measured both by the standard deviation and the GARCH model conditional variance and 5) quasi-rent reduction triggered by the SELIC rate reduction.

Comparing the two identified sub-periods, we evaluate that the taxing measures adopted in November 2010 succeeded in reducing the NPI, but, at the same time, for having been implemented in a

quasi-rent existence context, ended up stimulating the inflow of portfolio investments disguised as direct investments. Afterwards, the consecutive SELIC rate falls, by reducing the internal and international interest rate differential and the quasi-rent, was the crucial element for the effective reduction of capital inflows to the domestic financial market¹⁵.

V) Conclusions

We conclude that there were evidences of regulatory arbitrage practices through capital inflows in the Brazilian economy. These evidences do not exclude the existence of simultaneous greenfield investments, typical of FDI inflows. Notice that FDI inflows during 2000 were predominantly fusion and acquisition operations, which can represent greenfield operations. In contrast, these flows in the 1990's decade were mainly attracted by the Brazilian state program privatization. Thus, two simultaneous movements can be observed: large scale greenfield operations, and, at the same time, increasingly arbitrage operations due to the high international and domestic interest rates differential.

Besides, we infer that the vulnerability of Brazilian Balance of Payment is derived not only from the instability of international capital flows. There is evidence that Brazilian companies maneuvered their treasuries operations in order to obtain huge profits out of the fixed income investments and exchange transactions in the future markets.

The negative consequences of excessive speculative capital inflows are well known. These flows cause exchange rate valuation, reducing domestic companies profitability and market shares of Brazilian companies that operate in international markets. In addition, the domestic companies that increased dollar indebtedness exposures become more vulnerable to any unexpected changes in the international financial systems. The possibility of regulatory arbitrage practices by investors does not lead us to conclude that capital control measures should be abandoned. We defend the necessity of dynamic financial regulation, which means the BCB must be constantly concerned with the new financial instruments used to circumvent legislation and ready to adapt the controlling measures of capital inflows to them.

In this sense, however, it is worth pointing out the complexity of the capital control management, since they are dependent on country-risk evaluations. Besides, it is important to question the country risk evaluations by the rating agencies. It is well-known that even the rating agencies that follow specific and known methodologies, find significant difficulty to evaluate risk appropriately. This was made evident with the subprime crisis, which led to drastic financial devaluation of assets, which until then had been rated as very-low risky.

On the other hand, arbitrage with Brazilian treasury bonds can generate spreads and prices that favor massive future market speculation; and the Brazilian exchange rate volatility might be considered high enough to justify the IOF taxing in some financial flow categories. Therefore, even in a quasi-rent absence outlook, tributary measures might become relevant for achieving certain monetary and exchange rate policy goals.

Notwithstanding, this article's main message is to point out the existence of excessive revenues in the domestic financial markets (quasi-rents), as an undesired and unnecessary capital attraction factor. In this situation, the adoption of traditional capital control measures constitutes a strong stimulus for regulatory arbitrage and rapidly tends to lose its effectiveness. In this sense, we defend that the main economic policy instrument available to eliminate the internalized financial operations stimulated by the prevailing quasi-rents is a domestic interest rate path convergent to the prevailing levels in the external financial markets, according to the Covered Interest Parity and the normal component of (global) country-risk.

15 The quasi-rent reduction seems to have generated a monetary authority freedom degree, allowing tax cut measures (reduction in the IOF rates) to some kinds of external capital inflow by the Ministry of Economics (MF), in order to stimulate the domestic capital market and enlarge the public debt terms. Reduction, from 2% to 0% over external stock investments, both in the Initial Public Offering (IPO) and the secondary market; and, from 6% to 0% of the non-resident long term private bonds, with duration over 4 years (see Annex 1).

ANNEX 1

DATE	MACROPRUDENTIAL MEASURES
January/2008	IOF increase, from 5.00% to 5.38%, levied on foreign currency loans with less than 90 days maturity term
March/2008	IOF increase, from 0.38% to 1.5%, over foreign exchange operations liquidated through foreign capital inflows, including those involving fixed income investments and stocks.
October/2009	IOF increase levied on foreign exchange operations liquidated through foreign capital inflows involving: <ul style="list-style-type: none"> - fixed income investments: from 1.5% to 2.0% - variable-income investments made on stock exchanges or in future and commodities exchanges, in compliance with the regulations issued by National Monetary Council – CMN, except for trades in derivatives that result in predetermined yield: from 0.0% to 2.0% - purchases of shares by foreign investors in a public offering with the registration of the Brazilian Securities Commission – CVM, or into subscription of shares, provided that, in both cases, the issuers hold a registration to trade shares on stock exchanges: from 0.0% to 2.0%
October/2010	IOF increase levied on foreign exchange operations liquidated through foreign capital inflows involving: <ul style="list-style-type: none"> - fixed income and stock exchange investments: from 2.0% to 6.0% - creation of an initial or additional security margin, as required by stock exchanges and by futures and commodities exchanges: from 0.38% to 6.0%
December/2010	IOF increase levied on foreign exchange operations liquidated through foreign capital inflows involving: <ul style="list-style-type: none"> - resources originated by the change in the foreign investor direct investment regime, referred to by the 4131 Law of September 3rd, 1962, to stock exchange investment, as regulated by the CVM, from 0.38% to 2.0%
	IOF increase levied on foreign loans and financings with average term up to 90 days: from 5.0% to 5.38%
January/2011	Compulsory deposits over sold exchange rate position – from 0.0% to 60% over the parcel exceeding the lowest value: <ul style="list-style-type: none"> a) US\$ 3 billion; or b) Arithmetic average of the PR established level 1 values.
March/2011	IOF increase over exchange rate operation destined to the payment credit card and foreign acquisition of goods and services from 2.38% to 6.38%.
April/2011	IOF increase over entering value, with hired Exchange rate operation, related to external loans, hired directly or through international market stock issuing with maximum 720 day term from 0.0% to 6.0%.
	Raise in the compulsory deposit required over the banks sold position in the spot market. The limit to each institution went from US\$ 3 billion to US\$ 1 billion, or the equivalent to the patrimony reference. What exceeds these paths will have compulsory incidence.
July/2011	Changes in IOF regulations, with 1.0% taxing over Exchange rate derivatives sold liquid positions. IOF payment obligation for over 720 day term loans liquidates before the term.
March/2012	IOF increase over liquidation, by international investors, of exchange

	rate operation operations related to the entry of resources in the country, including those made through simultaneous with average term of up to 1180 days from 0.0% to 6.0%.
	IOF increase over the entering value with hired exchange rate operation, referring to foreign loans, hired directly or through the international stock market issuing with and average term of up to 1800 days, from 0.0% to 6.0%
	IOF reduction for Brazilian Depository Receipts (BDR), a stock buy certificate, from 2.0% to 0.0%.
	IOF increase rate over exporter anticipated payment operation (PA) for terms longer than 360 days: from 0.0% to 6.0%.

ANNEX 2

NDI (Net Direct Investment) = FDI (Foreign Direct Investment) – BDI (Brazilian Direct Investment)

The FDI can be decomposed into “Equity Capital” (direct purchases of shares in local stock markets by foreign investors) and “Intercompany Loans” (credits and loans amortization payment flows between a foreign head office and its Brazilian subsidiary), as follows:

$$\text{FDI} = \text{Equity Capital} + \text{Intercompany Loans}$$

These components may also be classified according account standards: the entry (credit) and the exit (debt).

The FDI equity capital ‘exit’ rubric refers to the alienation of previously acquired residing companies’ total or partial social capital. In the case of FDI intercompany loans, credits are composed in major part by loans taken by Brazilian subsidiaries from their foreign head offices, but also by received amortizations as a result of granted loans from Brazilian subsidiaries to foreign head offices.

BDI may also be decomposed in capital share (stock share purchase of a foreign company by a Brazilian one) and intercompany loans (credit flows and loan amortizations between Brazilian subsidiaries and its foreign head offices).

$$\text{BDI} = \text{Equity Capital} + \text{Intercompany Loans}$$

Here as well, the subcomponents might be classified in (when we count separately the entry (credit) and exit (debt) or net values). The BDI capital share entry rubric refers to the previously acquired residing companies’ total or partial alienation. In the case of intercompany BDI, the credits consist in Brazilian subsidiaries borrowings from their foreign head offices and also by amortizations received as a result of granted loans from Brazilian subsidiaries to their foreign head offices. The debts are composed by Brazilian subsidiaries borrowings from their foreign head offices and by Brazilian head office disbursements to foreign subsidiaries.

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