Exchange Rate Volatility and the Fear of Floating in Brazil

Márcio Holland

Professor of Economics at Business School at FGV/SP (EESP/FGV-SP) and at IE/UFU, Associate Researcher of the CNPq

Abstract

Many emerging market economies (EMs) have adopted a floating exchange rate regime after currency crises. Since 1999 Brazil has experienced a floating regime combined with inflation targeting. The Central Bank varies the interest rates in order to reach the targeted inflation rates and consequently the variability of the interest rates has been higher than the variability of the exchange rates. According to some economists, this is a clear symptom of the fear of floating and Brazil can not be an exception among the EMs. After assessing the behavior of the exchange rates and interest rates associated with other macroeconomic variables, this paper concludes that Brazil has not suffered from the fear of floating and that the Brazilian Central Bank does not care about exchange rate dynamics as much as it does about inflation.

Keywords: Exchange Rate Volatility, Monetary Policy, Exchange Rate Policy, Brazilian Central Bank, Fear of Floating

JEL Classification: E31, E37, E52

Resumo

Muitas economias emergentes têm adotado regime de taxa de câmbio flutuante após sofrerem crises cambiais. O Brasil vem experimentando o regime de câmbio flutuante combinado com metas de inflação desde 1999. O Banco Central altera a taxa de juros com o objetivo de alcançar a inflação da meta e conseqüentemente a variabilidade da taxa de juros tem sido maior do que a da taxa de câmbio. De acordo com alguns economistas este é um sintoma de "medo de flutuar" e o Brasil não é uma exceção entre as economias emergentes. Após analisar o comportamento da taxa de câmbio e da taxa de juros associada com outras variáveis macroeconômicas, este *paper* conclui que o Brasil não sofre do "medo de flutuar" e que o Banco Central se preocupa muito mais com a inflação do que com a dinâmica da taxa de câmbio propriamente dita.

⋆ Received in June 2005, accepted in October 2005. Without in any way implicating them, the author wishes to acknowledge the helpful comments provided by Prof. Barry Eichengreen (University of California, Berkeley), Prof. Harley Shaiken, Chair of CLAS (Center for Latin American Studies, University of California, Berkeley) which support made this work easier, as well as the generous financial

1. Introduction

According to IMF's *De Jure Classification* (2004), Brazil has experienced an independently floating exchange rate regime even in terms of Bubula and Ötker-Rober (2002)'s *De Facto* classification. On the other hand, Calvo and Reinhart (2002) found that countries that say they allow their exchange rates to float mostly do not and consequently, they suffer from an epidemic case of the "fear of floating". The debate about the way emerging market economies deal with their exchange rates may be associated with the choice from hard pegs, target zones to greater flexibility and whether or not the corner solution is valid both theoretically and on empirical grounds (bipolar view provided by Fischer (2001)) holds. However, many developing countries occupy the middle ground making intensive use of interest rates and foreign exchange reserves intervention in order to limit their exchange rates volatility. In this article we regard this care about the exchange rate variability as the strong "fear of floating".

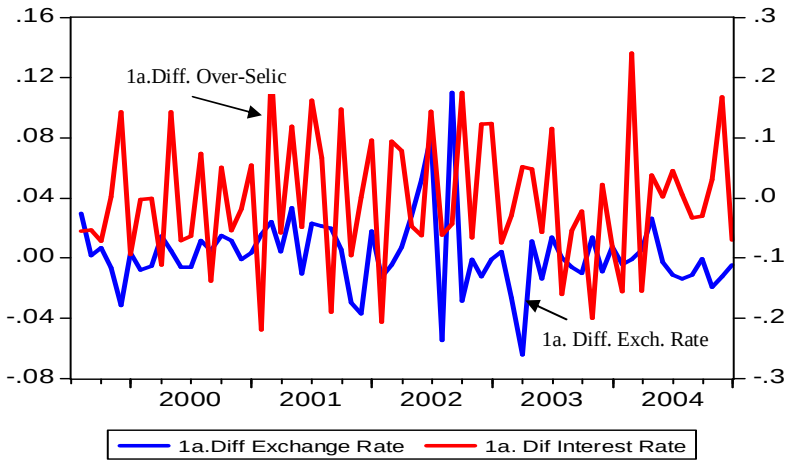
In order to observe this phenomenon, Calvo and Reinhart (2002) introduced an exchange rate index motivated by a model that considers the importance of the role played by the interest rates and the foreign exchange reserves. They found that variability of both international reserves, despite their measurement difficulties, and interest rates are relatively high related to the exchange rate variations. The reasons why countries may be reluctant to tolerate great variation in their exchange rates are associated with three aspects:

(i) lack of credibility;
(ii) high pass-through from exchange rate to domestic prices; and
(iii) inflation targeting.

It could also be related to liability dollarization, output costs associated with exchange rate fluctuations and loss of access to international capital markets. However, Calvo and Reinhart (2002) pay special attention to the combination of these three facts to explain the phenomenon.

In the real world, central banks of the emerging market economies are attempting to stabilize the exchange rate through open market intervention. Figure 1 shows that interest rate variability is bigger than the exchange rate variability in Brazil after adopting floating regime. Standard deviation of the monthly return of Over-Selic was about 12% while the standard deviation of the return of exchange rate was about 9.5%. In this case, the fear of floating in the strong sense would be observed.

support provided by CAPES and CNPq. I wish to acknowledge the helpful comments provide by the anonymous referees.
Email address: mholland@fgvsp.br



Source: Central Bank of Brazil.

Fig. 1. Brazil: Variability of Log of the Interest Rate and Exchange Rate (1999-2005)

Eichengreen (2002) suggests that the central bank, even having concerns about the exchange rate variability, does not care about exchange rate in the same way it does about inflation. Moreover, while a central bank raises interest rates in order to smooth the depreciation of the domestic currency, mainly during "Calvo shock" (a sudden stop in the capital inflows), "it will not prevent the exchange rate from moving, as the strong 'fear of floating' view would suggest. (...) Thus, while the degree of exchange rate flexibility will be limited by central bank policy, such flexibility will not be eliminated entirely. The currency will still exhibit greater flexibility than when it is pegged" (Eichengreen (2002):15). The consequence of this argument is that the more temporary the Calvo shock is the less the fear of floating would be.

Again, the central bank can not display the fear of floating when it has no instruments to prevent the exchange rate from adjusting to a new long-term equilibrium. Certainly, it can raise the interest rates if the exchange rates depreciate, even though there is no real reason to believe that it will reduce the interest rates when the exchange rates appreciate. Then, the fear of floating can fail.

The main aim of this paper is to provide some evidence whether or not the Central Bank of Brazil has displayed the fear of floating of the exchange rates, although inflation rates remain a great concern, and Brazil may show some aggravates such as relative high speed of passthrough, difficulty of forecasting inflation, liability dollarization and credibility issues, as pointed out by Eichengreen (2002) as elements that differentiate emerging market economies from developed economies. In the Brazilian case what remains the main concern is the problem of

monetary policy credibility associated with both difficulties of forecasting inflation and short-term liabilities rather than dollarization liabilities.

2. The Brazilian Experience

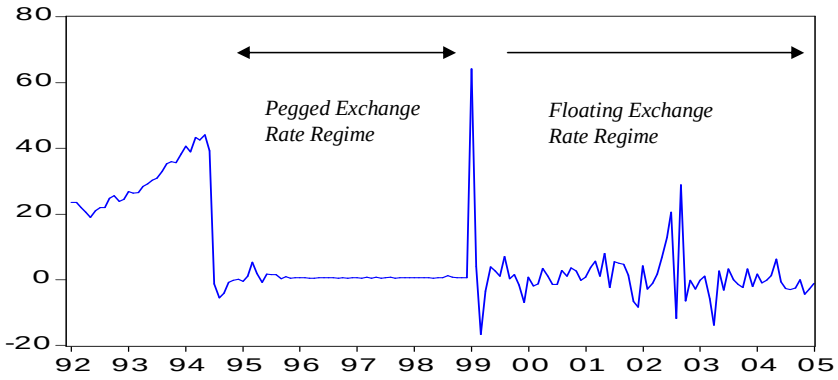
In January 1999, after a strong currency crisis, Brazil implemented the flexible exchange rate regime. More than six years later, have Brazilian policymakers allowed the domestic currency to float less than predicted by its classification and exhibited the fear of floating? In other words, has the Central Bank of Brazil used foreign reserves and short term interest rates to limit exchange rate volatility? Even if Brazil has pursued this policy is it the *fear of floating* or a symptom of the *inability of fixing*? Does the Central Bank in an emerging market economy really have the ability to prevent high exchange rate flexibility?

Figure 2 shows the nominal exchange rate dynamics and at a first glance it is fair to say that the domestic currency has floated quite a lot since 1999.[1] The high exchange rate volatility is an important issue in the eyes of the financial markets. Once more we could not disregard the idea that the Brazilian currency has been volatile. From January 1999 to January 2005, about six years of the floating regime, the nominal and real and effective exchange rates varied about 10 and 6 percent per month, respectively. Even highly volatile, the real and effective exchange rates showed unequivocal downward movement and the domestic currency has appreciated about 22 per cent since the flexible regime (using WPI – Wholesale Price Index– as deflator). This last fact can reveal the "fear of depreciating". The Central Bank has not reduced the interest rates to prevent appreciation. However, using the other deflator (CPI – Consumer Price Index), can be seen a very different situation. Domestic currency would have appreciated about 23 per cent over that period of time, that is, there is no fear of depreciation. Figure 3 shows this apparent ambiguousness. How could this difference be explained?

The difference between these two deflators (wholesale and consumer price indexes) may origin from another mechanism that goes beyond the exchange rate dynamics which might be closed associated with the responses of the central bank in the circumstances of the Calvo shock by increasing interest rates and, therefore, depressing the components of aggregate demand, such as investment and consumption. Thus, the lower the aggregate consumption is, the lower the passthrough from wholesale prices to consumer prices will be.[2] It seems like the "Prebisch shock" as labeled by Eichengreen (2002):18: "Now there are two offsetting effects on inflation: while higher import prices will be passed through into inflation, weaker aggregate demand will be deflationary".

Let's fall back on the idiosyncratic features some emerging market economies can show that may make a difference when compared to developed economies. We

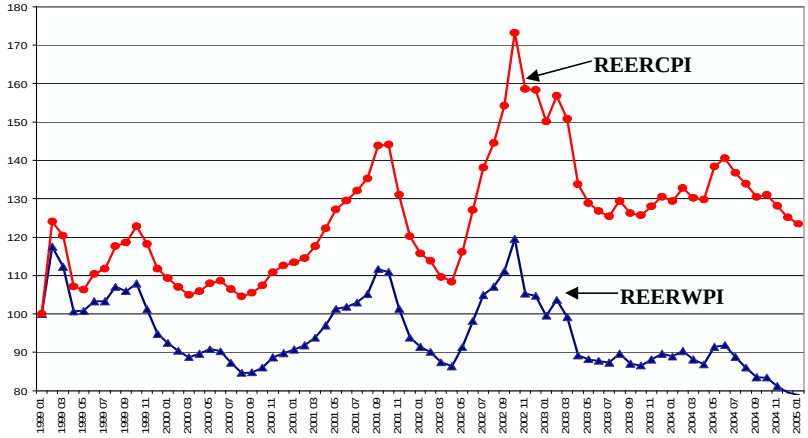
[1] Even real and effective depreciation has been far higher now than in previous period of time.
[2] Commodities and administrated prices should be taken into account in further research.



Source: Central Bank of Brazil

Fig. 2. Brazil: Real-USD Exchange Rate Variability -1st. Diff (1992-2005)

are going to lay close emphasis on two of these features: liability dollarization and credibility issues.



Source: IPEA
Notes: REERCPI = Real and Effective Exchange Rate deflated by the Consumer Price Index;
REERWPI = Real and Effective Exchange rate deflated by the Wholesale Price Index.

Fig. 3. Brazil: Real and Effective Exchange Rate: Appreciation or Depreciation? (1999-2005) 1999:01=100

3. Liability Dollarization

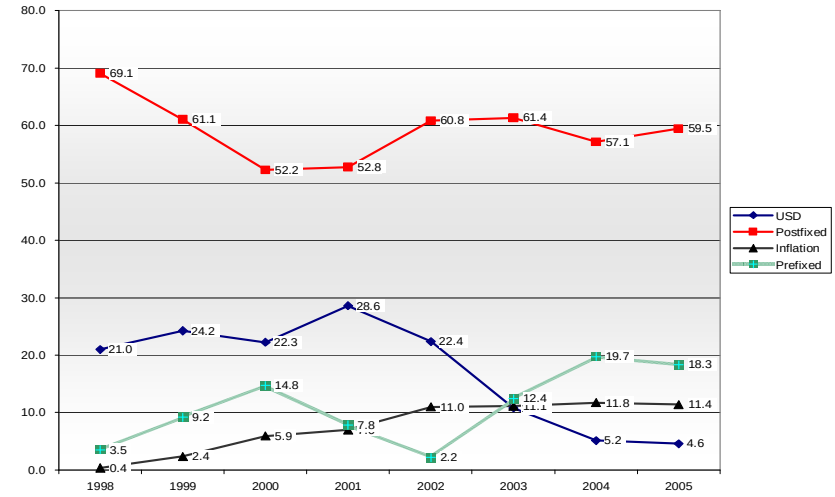
At the end of the pegged exchange rate regime, in December 1998, the U.S. Dollar-denominated federal debt averaged 20 percent of the total debt and it increased to 28.65 percent in the first two years of the floating regime (see Figure 4). Afterwards, one can see a clear downward movement of the dollar-denominated debt and a switch towards bonds denominated in short term interest rates and inflation rates (IGP – General Price Index). However, the high and stable level of the federal debt denominated in post fixed interest rates (Over-Selic) remains high. Thus, it is unequivocally fair to say that Brazil suffers from the "domestic original sin" (Eichengreen et al. 2003) since the country cannot borrow long term in its own domestic currency,[3] although the great reduction in the Dollar denominated debt can be considered an important result in an emerging market economy like Brazil and is therefore an important instrument to prevent financial instability.

How does the central bank deal with the exchange rates when it has concerns about its Dollar-denominated debt? It is unambiguous that meanwhile the Brazilian currency had been depreciating, the Central Bank was appropriately swapping the U.S. Dollar-denominated debt instruments for inflation rates and short-term interest rate denominated ones.

In the eyes of the market the commitment of the central bank with the inflation, mainly in countries under inflation target like Brazil, and even under credibility building process, the ongoing raises of the interest rates can be expressed in a positively sloped forward interest rate curve which means that short term debt instruments are frequently preferred to the others. In Brazil, this dynamics did not offset the reduction of the liability dollarization and both total (external and internal) debt and then domestic debt related to GDP kept increasing after floating regime (Figure 5). Although the recent downward movement is worth of note, it is still unpredictable and far from the average levels previous to 1999.

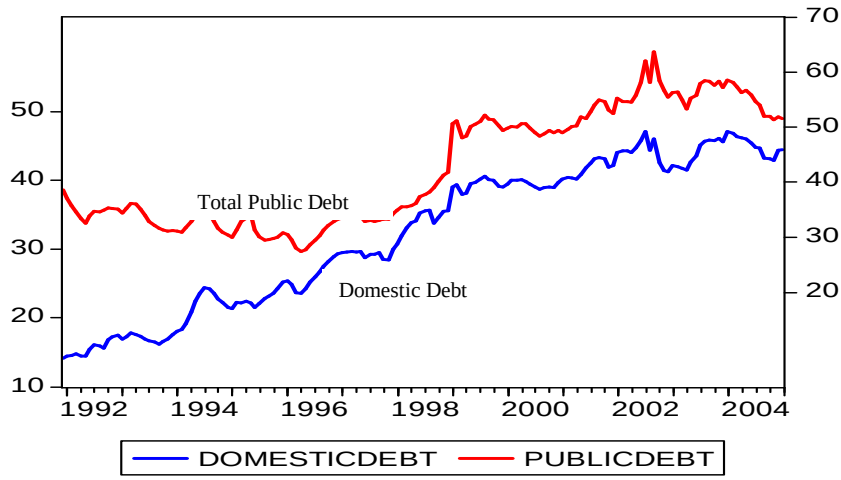
Thus, the dollarization liability issues can be changed to short-term liability. In this case, federal debt can emanate signs of the strength or weakness to the markets. Emerging market economies with high short-term federal debt and high government debt levels are more prone to suffer deeply during Calvo shock (Frankel and Wei 2004). Analyzing the Brazilian case in 2002 and 2003, Blanchard (2004) found that "the level and the composition of public debt in Brazil, and the general level of risk aversion in world financial markets, were indeed such as to imply perverse effects of the interest rates on the exchange rates and on inflation".

[3] The authors calculated the indicator of original sin for some countries according to main characteristics (total amount, maturity, currency and coupon) of the various governmental bounds present in each market. In a range from 0 (a country that issues all its securities in own currency) to 1 (a country that issues all its securities in foreign currencies), Brazil has 0.915.



Source: Central Bank of Brazil

Fig. 4. Brazilian Federal Debt – Bonds Issued Participation by Denomination (1994-2005)



Source: Central Bank of Brazil

Fig. 5. Brazil: Total and Domestic Public Debt – Percent of the GDP (1992-2005)

4. Sources of Exchange Rates Volatility in Brazil

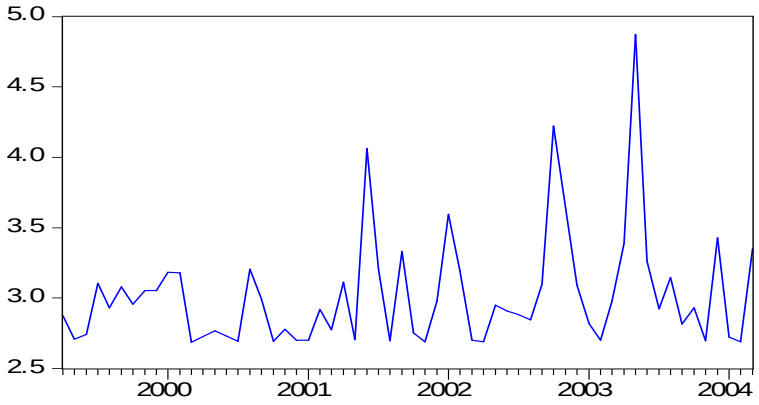
Putting together the virtual sources of exchange rate volatility in Brazil is an extremely complex task. However, we can fairly sum up four important sources of volatility: 1) inflation; 2) credibility; 3) liability composition and level; and 4) degree of openness.[4] We can also take into account that they are not isolated problems "living on the Robinson Crusoe's island", especially in emerging market economies. Credibility is built, indeed, under low inflation regime and with no currency mismatches.

Before evaluating the source of exchange rate volatility we should ask if Brazilian currency has really experienced low volatility. Certainly, the next question would be about the benchmark. Which type of asset could be considered a good benchmark? And what period of time could be used for comparison? The main point that can be drawn from Mark (2001:70) when the author compared descriptive statistics for exchange rates and equity returns, after developed countries implement flexible exchange rate regimes (1973-1997), is that "the volatility of the exchange rate returns is virtually indistinguishable from stock return volatility". Standard deviations calculated by Mark (2001) for the dollar quarterly returns were 5.5 percent, 6.35 percent and 6.08 percent on pound, deutschmark and yen, respectively.

In the Brazilian case, the monthly standard deviation reached nearby 5 percent and averaged 3.5 percent, from 1999 to 2004. Regarding the fact that we calculated the standard deviation using a different method from Mark (2001) and annualizing the data, it can be concluded that the exchange rate volatility in Brazil is far higher than in developed economies (Figure 6 illustrates this fact), during their golden time of floating. At the beginning of the inflation targeting system, from July 1999 to June 2002, according to Minella (2002):26: "the volatility of the exchange rates has been considerable", with a variation coefficient of 3 percent calculated using monthly exchange rates. Figure 6 shows the monthly volatility averaged at the same 3 percent in the entire period from 1999 to 2005.

However, Calvo and Reinhart (2002) suggest estimating the exchange rate volatility by considering instruments of the monetary policy such as interest rates and foreign exchange reserves, which results in the Exchange Rate Flexibility Index (λ). In this case: $\lambda = \sigma_{\varepsilon}^2/(\sigma_i^2 + \sigma_F^2)$, where $\sigma_{\varepsilon}^2, \sigma_i^2$ and σ_F^2 are the variances of the exchange rates, interest rates and foreign reserves, respectively. Then, the λ can range from zero, when there is a peg or a very high degree of commitment to inflation targeting, to 1, when seignorage weighs heavily in the policymaker's objective function (Calvo and Reinhart (2002):402). Despite some algebra issues, we have some reservations about this idea. First of all, and theoretically speaking,

[4] In this article we are not going to discuss openness issues either financial or trade openness. Correlated questions about capital control and policy recommendation such as capital account convertibility can be found in Arida et al. (2004), and a comprehensive and critical empirical analysis was provided by Gonçalves et al. (2005).



Note: Conditional standard deviation estimated according to first-order generalized autoregressive heteroskedastic model, GARCH (1,1)

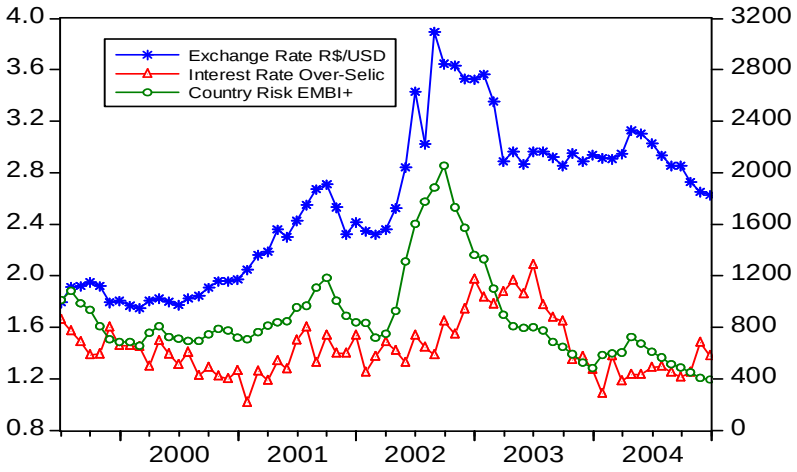
Fig. 6. Brazil: Monthly Conditional Standard Deviation of the Nominal Exchange Rate (1999-2004) – percent

there are sharp distinctions between pegged and inflation target regimes which were disregarded such as the own exchange rate volatility. It is expected that the exchange rates more volatile in inflation-target countries than in pegger ones, unless the authors really believe that the inflation targeting may lead the central bank to intervene in the exchange rate market in the same way it would do in a pegged regime context.

Secondly, and taking a look at the other side of the range, when λ can be nearby the 1, the exchange rate flexibility is therefore quite high, possibly expressing other features beyond the seignorage, such as the "inability of fixing" rather than the "fear of floating". This means that some Central Banks are unable to both avoid short-term nominal exchange rate movements and evaluate the effects caused by an unwilling long-term real and effective exchange rate trajectory. The assessment of Figure 3 comes out with this concern. Central Banks have completely different signs coming from different sorts of shocks (both "Calvo shock" and "Prebisch shock"). Once more, Brazil is not an exception.

Finally, there is a clear endogeneity problem among these variables. In a simple model that describes why a country might prefer a smooth exchange rates, Calvo and Reinhart (2002):399 assume that the "variance of the exchange rates are independent of the variance of the risk premium". However, one of the most likely important sources of the volatility of exchange rates in Brazil may be the variance of the risk premium (Figure 7). In Blanchard (2004):10, "An increase in the probability of default increases risk. This increase in risk leads to an increase in the exchange rates: to depreciation. For a given probability of default, an increase in the interest rates leads to a decrease in the exchange rates, to an appreciation: the standard channel through which monetary policy affects the exchange rates". In

addition, "the effect of an increase in the interest rates is, then, either to leave the probability of default unchanged (if next-period debt remains below the critical level), or to increase the probability of default. The effect is again stronger, the higher the initial level of debt" (Blanchard (2004):14).



Source: Central Bank of Brazil

Fig. 7. Brazil: Exchange Rate, Country Risk and Interest Rate (1999-2005) (Mean adjusted)

Now, the VAR (Vector Autoregression) analysis is an appropriate way to deal with these sources of volatility, especially because of the causality and endogeneity problems. In this case, we estimated the VAR (1) [5] to analyze the impulse-response functions and variance decomposition. [6] In order to estimate the basic relationship established by the fear of floating hypothesis, Figure 8 shows the response of the exchange rates to innovations in interest rates (Over-Selic).

[5] After testing different orders of the VAR and based on information criteria tests, VAR(1) was selected. All variables were tested for unit roots using different tests (ADF and Phillips-Perron) for each time series. All of them suggest that the time series are integreted of order one, i.e., I(1), although other unit root tests (Ng Perron and Elliot-Rothenberg-Stock Point-Optimal) indicated inconsistent results. As we run VAR (1) with non-integrated variables this inconsistence does not lead to further problems in our estimations.

[6] It is fair to use the VAR specification for forecasting systems of interrelated time series to analyze the dynamic impact of random disturbances on the system of variables. Once we have specified the VAR, we estimated the impulse-response functions and variance decomposition. An impulse-response function traces the effect of a one standard deviation shock to one of the innovations on current and future values of the endogenous variables. In summary, impulse- response functions trace the effect of a shock to an endogenous variable into the VAR. On the other hand, the variance decomposition provides a different method of depicting the system dynamics. It decomposes variation of an endogenous variable into the component shocks to the endogenous variables in the VAR. The variance decomposition gives information about the relative importance of each random innovation to the variables in the VAR. VAR impulse response functions and decompositions feature standard errors calculated either analytically or by Monte Carlo methods (analytic not available for decompositions in E-Views 4.1).

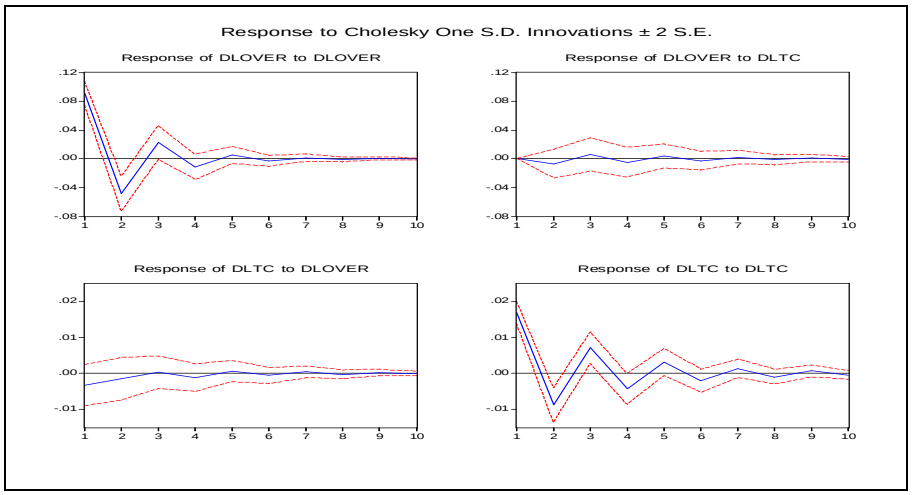


Fig. 8. Impulse-Response Function in Brazil: Interest Rate and Exchange Rate (1999-2005)

Once more, we do not include foreign reserves because of several measurement problems [7] and the VAR was controlled by other important variables such as country risk, foreign interest rates (U. S. Federal Fund) and domestic and foreign (U.S.A.) inflation rates. The first insights one can draw after examining Figure 8 is the clear evidence that the exchange rates do not respond statistically significantly to innovations in the interest rates, even under tremendous increases in the nominal interest rates by the Brazilian Central Bank.

As well-known in the economic literature, the nominal exchange rates can be expressed by the uncovered interest parity condition (UIP) and, consequently, expected changes in the exchange rates between two countries is equal to their interest rates differential and a risk premium, according to the following equation:

$$\triangle e_t = \gamma_1 \triangle i_t^F + \gamma_2 \triangle x_t - \gamma_3 \triangle i_t + \eta_t$$

where: $\triangle e_t$ is the first difference of the log of exchange rates; $\triangle i_t^F$ is the first difference of the log of foreign interest rates measured by Federal Fund rate in the U. S. A; $\triangle x_t$ is the first difference of the log of risk premium measured by EMBI + J. P. Morgan; $\triangle i_t$ is the first difference of the log of domestic interest rates (Over-Selic); and η_t is a white noise process. According to Table 1, it is fair to say that country risk plays an indistinguishable role in the exchange rates variation determination.

[7] In Holland (2003:22), "a more careful look suggests that we can observe a different and concerning situation when international exchange reserves are adjusted after considering liabilities associated with them, which represents a significant portion of international liquidity. In May 2004, adjusted (to liabilities) international reserves were US$24,700 billions instead of US$50,497 billions". Calvo and Reinhart (2002):388–389) also pointed out concerns about the "hidden" foreign exchange reserves.

Table 1
UIP Condition (1999:07-2005:01)

γ_1 (Foreing interest rate)	γ_2 Contry risk	γ_3 (Domestic interest rate)	R^2	DW	N
−0.06	0.24**	0.02	84%	2.2	66
(0.04)	(0.03)	(0.03)			

(**)significant at 5%; we implemented dummy variables for Presidential Election (2002).

On the other hand, according to Table 2, for the full period of the floating regime (1999-2005), almost forty percent (40%) [8] of the variance of the exchange rates, after ten months, can be explained by reactions to shocks from country risk variation, and only about 1 percent (0.9%), after ten months, for the case of interest rates. [9] However, during the 2002 Calvo shock (Presidential Election), Table 3 shows the importance of the inflation shock in the exchange rate variance (5.85%), and the interest rate forecast-error explained in more detail in this specific sample (2001:07-2003:06). Then, the forecast-error variance of exchange rates attributable to the orthogonalized innovations in interest rates is relatively low and 9.7% for full sample i.e., 1999:01-2005:01, and the sample of stress, i.e., 2001:07-2003:06 – herein considered as Presidential Election Shock –, respectively), so we can conclude that the Brazilian Central Bank does not suffer from the *fear of floating*, in the way we defined before. Moreover, some inability of fixing is closely associated with its fiscal constraint (Blanchard (2004) and Holland and Vieira (2003)). Most importantly, the "domestic original sin" (Eichengreen and Hausmann 1999) expressed by high short-term federal debt reveals the way the central bank borrows and its consequences in terms of its low autonomy in intervening in the exchange rate market.

5. Final Remarks

This article presented empirical evidence analyzing the hypothesis of the fear of floating, and the Brazilian Central Bank does not exhibit this phenomenon. We presented some considerations about the dollarization liability issues, but the domestic original sin remains a great concern since the short-term public debt is the highest portion of the domestic debt. Lack of credibility associated with both difficulties in forecasting inflation and in reaching the target of the inflation and, at the same time, high and volatile risk premium can be the main factors to explain the inability of fixing, that is, the shortsightedness in managing the exchange rates.

[8] Apparently strong this result is close to empirical findings in Loureiro and Holanda Barbosa (2004), when the authors drawn the conclusion that fiscal debt is much more important than the current account in explaining risk premium shocks.

[9] Different Cholesky Orderings were tested and the results kept the same.

Table 2
Variance Decomposition of Exchange Rate (1999-2005)

Period	S.E.	US FF (Return)	Risk (EMBI+Return)	Over-Selic (Return)	Exchange Rate (Depreciation)
1	0.049	0.40	38.77	0.50	60.31
2	0.056	0.66	41.70	0.75	56.87
3	0.059	0.82	39.49	0.73	58.94
5	0.060	0.87	38.69	0.86	59.56
10	0.060	0.88	38.43	0.90	59.77

Cholesky Ordering: US Federal Fund (FF), Risk, Domestic Interest Rate (Over-Selic) and Exchange Rate.

Table 3
Variance Decomposition of Exchange Rate "Calvo Shock" (2001:07-2003:06)

Period	S.E.	Domestic (Inflation (CPI)	Over-selic (Return)	Risk (Return)	US FF (Return)	Exchange Rate (Depreciation)	US inflation (WPI)
1	0.031	3.82	7.58	51.43	0.16	36.99	0.00
2	0.037	2.89	6.00	47.09	2.74	38.91	2.35
3	0.041	4.66	8.71	40.61	2.37	40.72	2.89
4	0.043	5.41	8.85	37.60	3.32	40.66	4.13
5	0.044	5.67	9.50	36.33	3.22	40.73	4.53
10	0.045	5.85	9.75	35.68	3.37	40.28	5.04

Domestic Inflation, Domestic Interest Rate (Over-Selic), Risk (EMBI+), US Federal Fund (FF), Exchange Rate, US Inflation (WPI).

This article also sheds light on the idea that in the context of an inflation forecast problem the central bank may fail to foresee a long-term equilibrium real exchange rate. Moreover, during a debt swapping process, the Central Bank could properly take advantage of the appreciating movements in the exchange rates, although the total debt might not change significantly towards a reasonable historical level. Therefore, on one hand, in a short-term perspective, the Central Bank can be shortsighted in using its main monetary instrument to control the exchange rate volatility.

References

Arida, P., Edmar, B., & Lara-Resende, A. (2004). Credit, interest and jurisdictional uncertainty: Conjectures on the case of Brazil. Instituto de Estudos de Política Econômica, Casa das Garças, Rio de Janeiro, Brazil (unpublished manuscript).

Blanchard, O. (2004). Fiscal dominance and inflation targeting: Lessons from Brazil. NBER, NBER Working Paper.

Bubula, A. & Ötker-Rober, I. (2002). The evolution of exchange rate regimes since 1990: Evidence from De Facto policies. IMF Working Paper 02/155. Washington: International Monetary Fund.

Calvo, G. & Reinhart, C. (2002). Fear of floating. *The Quarterly Journal of Economics*, CXVII(May):379–408.

Eichengreen, B. (2002). Can emerging markets float? Should they inflation target? University of California, Berkeley (unpublished manuscript).

Eichengreen, B. & Hausmann, R. (1999). Exchange rate and financial fragility. NBER Working Paper 7418. http://www.econ.berkeley.edu/ eichengr/index.html.

Eichengreen, B., Hausmann, R., & Panizza, U. (2003). Original sin: The pain, the mystery. University of California, Berkeley, August 2003.

Fischer, S. (2001). Exchange rate regimes: Is the bipolar view correct? IMF.

Frankel, J. & Wei, S.-J. (2004). Managing macroeconomic crises: Policy lessons. Draft chapter for Managing volatility and crises: A practitioner's guide (unpublished manuscript).

Gonçalves, F., Holland, M., & Spacov, A. (2005). Can jurisdictional uncertainty and capital controls explain the high level of real interest in Brazil? Evidence from panel data. University of California, Berkeley (unpublished manuscript).

Holland, M. & Vieira, F. (2003). Country risk endogeneity, capital flows and capital controls in Brazil. *Revista de Economia Política*, 23(1):12–38. Encontro Nacional de Economia, ANPEC.

Loureiro, A. & Holanda Barbosa, F. (2004). Risk premia for emerging markets bonds: Evidence from Brazilian government debt, 1996-2002. Working Paper, Brazilian Central Bank. Brasilia.

Minella, A. (2002). Inflation targeting: Lesson and challenges. Working Paper, Brazilian Central Bank. Brasilia.