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The Market of Foreign Exchange Hedge in Brazil: Reaction of Financial Institutions to Interventions of the Central Bank

Fernando N. Oliveira
Central Bank of Brazil and IBMEC/RJ

Abstract

Between 1999 and 2002, Brazil's Central Bank sold expressive amounts of dollar indexed debt and foreign exchange swaps. This paper shows that in periods of high volatility of the exchange rate, first semester of 1999 and second semester of 2002, the Central Bank of Brazil increased the foreign exchange hedge, but the financial institutions used this to reduce their foreign exchange exposure. In contrast, increases in foreign hedge during periods of low volatility of the exchange rate were transferred to the productive sector.

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Contact: Fernando N. Oliveira - fernando.nascimento@bcb.gov.br.
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1. Introduction

One of the main functions of the central bank is to administer the foreign exchange reserves of the country, intervening in the foreign exchange market when the foreign exchange policy needs. In such circumstances the classic instrument is to sell or buy foreign exchange in the spot market. In the last decades, however, interventions through foreign exchange derivatives, such as, the selling of public bonds indexed by the exchange rate or foreign exchange swaps have become more common in some emerging markets, like Brazil or Mexico.[12]

Mishkin (2001) and Blejer and Shumaker (1997) give explanations for the increasing participation of central banks in the foreign exchange derivative markets. For these authors such derivatives imply a short position in dollars for the central bank and a long position in dollars for the private sector. These derivatives are basically purchased by financial institutions that use them as guarantees to offer protection against foreign exchange devaluation (hedge) to the productive sector. Without the supply of these foreign exchange derivatives the market of foreign exchange hedge would crash in periods of foreign exchange crisis and the productive sector of the country would be subject to a high volatility of the exchange rate, that, in the best case, would increase the cost of capital of the firms, and, in the worst case, would generate a cycle of destructive bankruptcy. [34]

Mishkin (2001) and Blejer e Schumaker (1997) suggest that financial institutions are only transferring risk. However, the financial institutions do not work necessarily with matched operations between assets and liabilities. This is clear if we consider maturity or currency. It is thus possible that the financial institutions decide to sell foreign exchange hedge without another transaction that aims in eliminating or minimizing the risk involved in selling the hedge.

[1] Despite being more common, there are used much less used than spot market interventions, as a survey by Canales and Kriljenko (2004) report.

[2] Galati and Disyatat (2003) provide a comprehensive overview of what is known about the effectiveness of foreign exchange intervention in emerging market countries. The effectiveness of intervention appears to be dependent on the monetary policy framework pursued and whether the intervention is publicly announced or not. There appears to be a link between the depth and sophistication of the capital market and the effectiveness of intervention. In terms of the impact of the effectiveness of intervention, the evidence is clear-cut with respect to the volatility than to the level of the exchange rate. Underdeveloped financial markets also imply that hedging against exchange rate risk is costly and sometimes impossible, so that the costs of exchange rate volatility can be substantial for individual agents and for the economy as a whole.

[3] To understand the reasons for domestic agents of emerging markets to be indebted in foreign exchange see: Olivier (2002), Dooley (1999), Haussman e Eicheengreene (1999) e Haussman e Eicheengreene (2003).

[4] In particular in the case of Brazil, foreign exchange swaps were very important in the 2002 financial crisis, as pointed out by Oliveira and Novaes (2007). Oliveira and Novaes show that currency swaps were the main instrument of foreign exchange derivatives used by corporations in Brazil and were used for hedge as well as speculative purposes. The data the authors collect show that a great number of corporations that used foreign exchange derivatives had debt in foreign currency. In general, this debt had middle to long-term maturities, with disbursement of interests done irregularly. Oliveira and Novaes document that the total volume of transacted currency swaps between firms and financial institutions is quite superior to the volume negotiated among non-financial firms. Between 1999 and 2002, the daily stock of currency swaps among corporations was on average 3% of the daily stock of currency swaps done between financial institutions and corporations. Among the currency swaps, those for which the US dollar is one of the objects of operation represent more than ninety-five percent of the total volume negotiated.

The arguments of Mishkin (2001) and Blejer and Shumaker (1997) are naturally appealing. However, they need to be verified empirically. It is not obvious that an increase in the supply of hedge of the central bank will be transferred to the productive sector. As a matter of fact, in times of high foreign exchange risk, an increase in the supply of the hedge may be completely absorbed by the financial institutions for hedge or speculative purposes, making the interventions of central banks in the foreign exchange derivatives market unable to affect the productive sector, contrary to the arguments of Mishkin and Blejer and Schumaker. Therefore, the impact of the interventions of central banks in these markets is still an open question.

In this paper, we will seek to answer this question using an original database with 74,000 contracts of foreign exchange swaps that where written between 1,318 firms and 43 financial institutions from 1999 to 2003 in Brazil. This database was built from confidential information of the financial institutions following a request from Brazil´s Central Bank. The foreign exchange swap is by far the most important foreign exchange derivative used by corporations in Brazil, as available data from the Exchange of Futures and Other Derivatives in Brazil- *Bolsa de Mercadorias e Futuro-BM&F*- and the Clearing of Private Bonds of the Financial Institutions - *Central de Custódia de Títulos Privados - CETIP* - make clear. Therefore, this database is the most representative of the demand of foreign exchange derivatives in Brazil, allowing that we document the reaction of the financial institutions with respect to interventions of the Central Bank of Brazil, as far as their foreign exchange exposure and of their clients is concerned.

We will consider two hypotheses. One is that in times of foreign exchange crisis, increases in the supply of foreign exchange hedge from the central bank will be absorbed by the financial institutions to decrease their foreign exchange exposure generated before the foreign exchange crisis, when the financial institutions supplied hedge to the productive sector in excess to the supply of the central bank. The alternative hypothesis is that part of that supply of hedge is transferred to the productive sector, following the arguments of Mishkin (2001) and Blejer and Shumaker (1997).

The fundamental conclusion of the paper is that, in times of foreign exchange crisis, the financial institutions absorb the supply of foreign exchange hedge from the Central Bank of Brazil. These institutions take advantage of these interventions to reduce their foreign exchange exposure, but they do not seem capable to reduce the impact of the exchange rate crises over the productive sector.

The rest of the paper is organized as follows. Section 2 describes the data. Section 3 shows the empirical analysis. Section 4 concludes.

2. Data

We will divide our sample period in three periods. The two periods corresponding to the foreign exchange crisis, first semester of 1999 and second semester of 2002, and the period of no foreign exchange crises from July 1999 to April 2002.

Between January 1999 and April 2002, *NBC-E* (*Notas do Banco Central - Série E)* and *NTN-D* (*Notas do Tesouro Nacional - Série D)* were the main instruments that the Central Bank of Brazil used to supply the market with foreign exchange hedge. Such dominance stopped existing in may 2002, when the Central Bank of Brazil started selling Financial Letters of the Central Bank (*Letras Financeiras do Tesouro), LFT,* together with foreign exchange swap contracts, a combinations that kept the Central Bank of Brazil long in a floating rate, *CDI*, and short in the depreciation of the nominal exchange rate.

It follows, then, that between 1999 and 2002, the stock of foreign exchange hedge supplied by the Central Bank was given by the sum of *NBC-E* and *NTN-D* in the market and by the stock in the market of foreign exchange hedge. The data concerning this stock was obtained in the Department of Open Market Operations of the Central Bank. Graph 1 shows the evolution of this stock in dollars through January 1999 to December 2002.[5]

The information concerning interventions of the Central Bank in the hedge market is presented in Table 1 for several periods that we considered. The dates of interventions are identified as the ones in which the first difference of the stock of foreign exchange hedge (swaps and public bonds indexed by the dollar) in the market is greater in modulus than the average of the series (considering the whole sample) plus two standard deviations.[6] We recorded 241 interventions in the whole period, 147 of which were positive interventions, this is, where the Central Bank increased the stock in the market of foreign exchange derivatives and 94 where the Central Bank reduced this stock. In all periods considered, the daily average of interventions is positive. In fact, the supply of foreign exchange swaps in the foreign exchange crisis of the second semester of 2002 increases considerably the daily average, that change from US$ 4.58 millions (not reported in the table), between January 1999 and April 2002, to US$ 55.23 millions.

Future contracts of foreign exchange are not the only instruments of hedge available for the financial institutions. They can also transact, for example foreign exchange options, foreign exchange forwards and foreign exchange swaps. All these transactions are necessarily recorded in the BM&F or in CETIP. At the latter are basically recorded the foreign exchange swaps, which are operations off-exchange, between two companies or between one financial institutions and a company. [7]

In this paper, a database of foreign exchange swaps between financial institutions and firms was built with confidential data that was requested by the Central Bank of Brazil to 43 financial institutions that operate in the market. There are 74,000 contracts of foreign exchange swaps that correspond to 98% of the total volume of foreign exchange swaps between firms and financial institutions, in the period from January 1999 to December 2002.[8]

Table 2 shows the stock of foreign exchange swaps of the financial institutions. The series of the sum of short and long positions in dollars shows an increase from US$ 5.69 billions in the first semester of 1999 to US$ 21.4 billions in the second semester of 2002. Table 2 shows that the average of the net positions (short minus long positions in dollars) was always positive, this is, indicating that foreign exchange depreciations impose losses to

[5] The original series of NTN-D and NBC-E and foreign exchange swaps were informed by the Central Bank in reais. We used the nominal exchange rate of the day before to transform them in dollars.

[6] Our empirical results do not change if we considerer one or three standard deviations.

[7] According to information of BM&F, future of dollars are only liquid for maturities of 30 or less days and their daily open stock was always inferior to 3% of the daily stock of foreign exchange swaps between companies and financial institutions. Foreign exchange options are even less liquid. It follows then that in the recent period the market of foreign exchange swaps was the most representative of the market of hedge between companies and financial institutions.

[8] The Central Bank asked information from 50 financial institutions at first. Some of these institutions were acquired by others of the group of 50, between 1999 and 2003. The institutions that bought the others took the responsibility to inform about the contracts of foreign exchange swaps of the financial institutions that were acquired. This explains why the number of institutions that responded was 43 and not 50. The remaining two percent of the contracts were closed by institutions that had technical difficulties in responding to the request of the Central Bank

the Central Bank of Brazil and gains to the financial institutions in the counterpart of these contracts. They vary from US$ 3.13 billions in the first semester of 1999 to US$ 12.30 billions in the second semester of 2002.

3. Empirical Analysis

We have two distinct hypotheses about the reaction of the financial institutions to the interventions of the Central Bank in the foreign exchange market. For Mishkin (2001) and Blejer and Shumaker (1997) an increase in the supply of hedge by the Central Bank of Brazil is transferred from financial institutions to the firms. In the alternative hypothesis, an increase in the supply of foreign exchange hedge by the Central Bank of Brazil is not necessarily transferred by the financial institutions. These can maintain the hedge to reduce its foreign exchange exposure.

To test these two hypotheses we will use the first difference of stock of net positions of foreign exchange swaps (short positions minus long positions in dollars) as a dependent variable. First of all, in a regression using ordinary least squares that considers the stock of foreign exchange swaps between firms and financial institutions independent from the interventions of the Central Bank. After estimating this basic regression, we estimate our regression using two stage least squares to take account of a possible simultaneity of the decision of the Central Bank to intervene and of the financial institutions to supply hedge to the corporations. [9]

In the first approach to evaluate the interaction of the reaction of the financial institutions in the foreign exchange swap market and the interventions of the Central Bank in the derivatives market we estimate the coefficients of regression (1) below using ordinary least squares.

Δ (net aggregate stock - short minus long positions in dollars) of foreign exchange swaps between financial institutions and firms = $C_0 + C_1$ (interventions of the Central Bank in the foreign exchange derivative market)+ C_2 Δ (foreign exchange coupon) + C_3 Δ(stock market general index, *IBOVESPA*,) + C_4 Δ (rate of certificate of deposits between financial institutions, CDI) + ε (1)

Our main concern is in the sign of the coefficient C_1 of the intervention of the Central Bank in the derivatives market. Our null hypothesis is that if the Central Bank increases (decreases) the supply of hedge then the financial institutions will increase (decrease) their stock of net positions (short minus long positions in dollars) of foreign exchange *swaps* with the firms. That is, in this hypothesis the coefficient C_1 is greater than zero.

In the alternative hypothesis, an increase in the supply of foreign exchange hedge of the Central Bank of Brazil is completely used by the financial institutions. They use it to reduce their foreign exchange exposure. That is, in the alternative hypothesis the coefficient C_1 is zero. The other independent variables of equation (1) influence the expectation of the flow of foreign exchange capital to the economy. This is a key variable that is taken in consideration to evaluate the foreign exchange risk of emerging markets like Brazil, for instance. Such expectation affects the propensity of financial institutions to put in their portfolios assets that are related to foreign exchange risk, which is relevant in the alternative hypothesis. For example, an increase in the rate of certificate of deposits between financial institutions (CDI) or in the interest rates that prevails in foreign exchange

[9] We test for unit root using Augmented Dick-Fuller (1979) and Philips-Perron(1988) for the dependent and all explanatory variables in our regression. In all our tests, we reject the null of unit root.

derivatives market (foreign exchange coupon) attracts foreign capital, reducing the pressures against foreign exchange depreciation. In this case, we expect that the financial institutions will have a greater tendency to supply credit against foreign exchange depreciation, without the need for the institution to use the hedge supplied by the Central Bank of Brazil. In an analogous way, the IBOVESPA index captures changes in the expectations of agents that for one side can signal a decrease in the foreign exchange risk and, on the other side, can imply an increase in the volume of imports that force a depreciation of the nominal exchange rate. Therefore, these two conflicting effects do not allow us to affirm in a priori basis, which will be the sign of the IBOVESPA coefficient.

The results of the estimation of equation (1) are presented in Table 3. All standard errors are robust to heterocedasticity and autocorrelation (Newey West standard errors).

Table 3 shows an asymmetric behavior of the impact of the interventions of the Central Bank of Brazil in the derivatives market. These interventions do not impact the stock of net positions (short minus long positions in dollars) of the swaps contracts of the financial institutions with firms in the first semester of 1999 and on the second semester of 2002, when Brazil suffered two foreign exchange crises. As a matter of fact, in the first semester of 1999 as well as in the second semester of 2002, not only the coefficients of the interventions of the Central Bank of Brazil but also the coefficients of other independent variables (first difference of CDI, first difference of the foreign exchange coupon, and the first difference of the IBOVESPA) were not significant. The F statistic rejects the hypothesis that all variables were statistically equal to zero. The Ramsey test did not reject the specification of the model.

In contrast, Table 3 shows that an increase in the supply of foreign exchange hedge of the Central Bank of Brazil increases the net aggregate stock in the market of foreign exchange swaps written between financial institutions and firms (short positions minus long positions in dollars) in the period between foreign exchange crises (from July 1999 to April 2002). In this period, an increase in the supply of foreign exchange hedge by the Central Bank of Brazil increases the net aggregate stock of foreign exchange swaps (p-value of 0.05), but this increase (0.44 is the coefficient) is statistically lower than 1 (p-value of 0.05). Even in periods of low volatility of the nominal exchange rate the financial institutions use part of the increase of the supply of hedge to the Central Bank of Brazil to reduce their foreign exchange exposure. Finally, as well as in periods of crises, the other independent variables are not statistically significant, despite the fact that the Ramsey test does not reject the specification of the model. Only when we consider the whole sample, the other independent variables (first difference of the CDI, first difference of the foreign exchange coupon and the first difference of the IBOVESPA) become significant at the 5% level.

To take in consideration the possible simultaneity of the decision of interventions of the Central Bank of Brazil and of the supply of foreign exchange swaps of financial institutions to firms we estimate our basic regression using two stage least squares. We use as instruments lagged values of the depreciation of the nominal exchange rate. The results are presented in Table 4 and confirm the ones of the ordinary least squares estimation in the preceding section. Once again, the financial institutions did not transfer to the productive sector the interventions of the Central Bank of Brazil in the periods of the foreign exchange crises.

Table 4 shows that the interventions of the Central Bank of Brazil do not impact the net stock positions (short minus long positions in dollars) of the financial institutions. Both

in the first semester of 1999 and in the second semester of 2002, not only, the coefficient of the interventions but also the coefficients of the other variables (first difference of the rate of certificate of deposits between financial institutions, CDI, the first difference of the IBOVESPA, and the first difference of the foreign exchange coupon) are significant. The F statistic does rejects the hypothesis that the independent variables are all statistically equal to zero. The Ramsey test does not reject the specification of the model. Table 4 shows once again an asymmetric behavior of the impact of the interventions of the Central Bank of Brazil in the derivatives market. These interventions do not impact the stock of net positions (short minus long positions in dollars) of the swaps contracts of the financial institutions with firms in the first semester of 1999 and on the second semester of 2002, when Brazil suffered two foreign exchange crises. In contrast, Table 4 shows that an increase in the supply of foreign exchange hedge of the Central Bank of Brazil increases the net aggregate stock in the market of foreign exchange swaps written between financial institutions and firms (short positions minus long positions in dollars) in the period between foreign exchange crises (from July 1999 to April 2002).

Summing it up, the results of the estimation of equation (1) are evidence that in periods between foreign exchange crises the interventions of the Central Bank of Brazil reach the productive sector. This does not happen in the periods of foreign exchange crises, when despite the fact that the volume of interventions increased, the financial institutions did not increase their short positions of the foreign exchange hedge with firms. That is, in these periods the financial institutions use the increase of the supply of hedge to decrease their foreign exchange exposure. [10]

5. Conclusion

This paper shows that the reaction of the financial institutions to interventions of the Central Bank of Brazil in the foreign exchange market varies with the volatility of the nominal exchange hedge. In periods of high volatility of the nominal exchange rate (periods of foreign exchange crisis), the institutions demanded the foreign exchange derivatives but did not transfer them to the corporations. This transfer did however occur in periods between crises but even then it is not a complete transfer. This means that the financial institutions absorb part of the hedge of the Central Bank of Brazil to reduce their own foreign exchange exposure.

The main conclusion of the paper is contrary to the arguments of Mishkin (2001) and Blejer and Shumaker (1997). That is an increase in the supply of hedge of the Central Bank of Brazil does not reach the productive sector in periods of foreign exchange crisis. Arguments in favor of the Central Bank of Brazil supplying hedge in these periods must be based on benefits related to the reduction of the foreign exchange exposure of the financial system. Future work should go further in this direction.

[10] However, the interventions of the Central Bank of Brazil in the foreign exchange derivative market in periods of crises in the foreign exchange market may have been useful to reduce the systemic risk of the financial system which as Caballero (2001), Caballero and Krishnamurth (2001) and Caballero (2003) point out is a reason to justify such interventions. These interventions may have served also to smooth the dynamics of the nominal exchange rate, which is another reason for justifying them as Calvo (1997) indicates.

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Graph 1

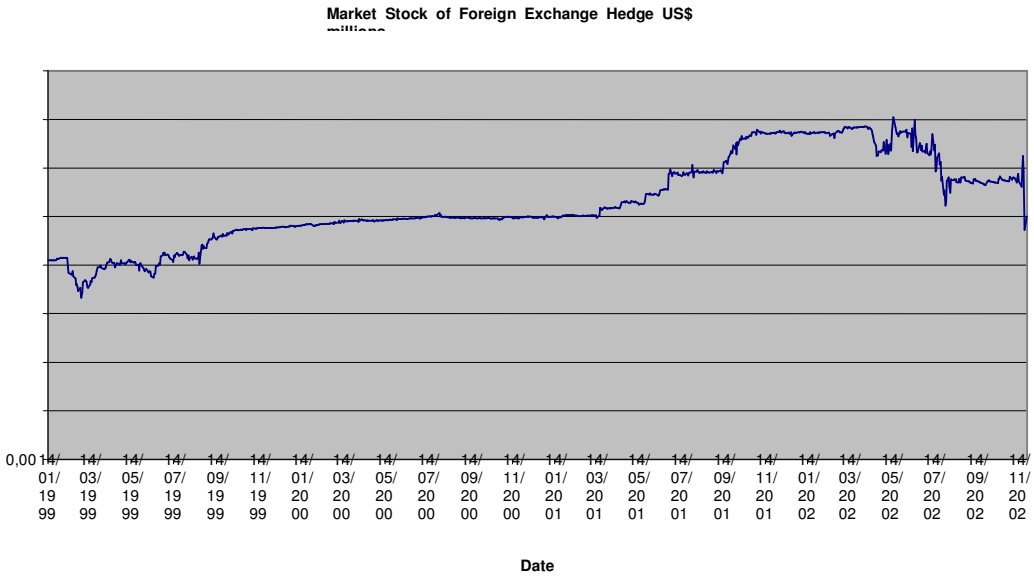

Table 1 Interventions of the Central Bank of Brazil in the Foreign Exchange Market

This table presents the number of interventions of the Central Bank of Brazil in the foreign exchange market between 1999 and 2002, as well as the average value of interventions and the standard deviations (in parenthesis). The dates of interventions are identified as the ones in which the first difference of the stock of foreign exchange hedge (swaps and public bonds indexed by the dollar) in the market is greater in modulus than the average of the series (considering the whole sample) plus two standard deviations. The series of stock of foreign exchange hedge in the market is the sum of the stock of public bonds indexed by the dollar in the market and the stock of foreign exchange swaps in the market. The volume of intervention is the first difference of the series of the stock of foreign exchange hedge in the market at the date when the intervention occurred. When the Central Bank of Brazil does not intervene we consider the intervention to be zero. The periods of foreign exchange crisis are the first semester of 1999 and the second semester of 2002. The period in between crises goes from July 1999 to April 2002.

	Foreign Exchange Crises		**No Crises**	**Whole Sample**
	1999/1	**2002/2**	**07/1999 a 04/2002**	**01/1999 a 12/2002**
Total Number of Interventions of the Central Bank	16	52	173	241
Total Number of Interventions that Decreased the Supply of Hedge	6	17	71	94
Total number of Interventions that Increased the Supply of Hedge	10	35	102	147
Average Value of Interventions (US$ millions)	6.34 (42.00)	55.23 (545.59)	5.33 (60.73)	12.84 (225.85)

Table 2 Aggregate Stock of Foreign Exchange Swaps of Financial Institutions

Our sample consists of 43 financial institutions with open foreign exchange swap contracts from 1999 to 2002. This table presents the daily average and in parenthesis the standard deviation of the series of the total aggregate stock (short plus long positions in dollars) and of the net aggregate stock (short minus long positions in dollars) of foreign exchange swaps. We also show for each period the daily average of the quotient of long positions to short positions in dollars. The foreign exchange crises are the first semester of 1999 and the second semester of 2002. The other periods are the years 1999, 2000, 2001, 2002 and the whole period without any foreign exchange crises, from July 1999 to April 2002.

	Foreign Exchange Crises		**Whole Sample**				
	1999/1	**2002/2**	**1999**	**2000**	**2001**	**2002**	**07/1999 a 04/2002**
Short Positions plus Long Positions in Dollars (US$ billions)	5.69 (1.66)	21.4 (3.68)	12.10 (8.32)	21.30 (1.41)	25.00 (1.26)	23.60 (3.73)	17.92 (4.99)
Short Positions minus Long Positions in Dollars (US$ billions)	3.13 (0.90)	12.30 (2.48)	7.24 (6.91)	15.11 (2.97)	17.88 (2.27)	15.92 (3.27)	12.20 (5.97)
Long Positions /Short Positions	0.29	0.27	0.24	0.17	0.16	0.23	0.19

Table 3 Reaction of the First Difference of the Net Aggregate Stock (Short Minus Long Positions in Dollars) of the Foreign Exchange Swaps of Financial Institutions to the Interventions of the Central Bank of Brazil

The dependent variable is the first difference of aggregate net stock (short minus long positions in dollars) of foreign exchange swaps of the financial institutions. The independent variables are the interventions of the Central Bank of Brazil, the first difference of the foreign exchange coupon, the first difference of the IBOVESPA and the first difference of the rate of certificate of deposits between financial institutions, CDI. Below the estimated coefficients, in parenthesis are the p-values obtained using the Newey and West (1987) standard errors that control for possible heterocedasticity and autocorrelation of the residuals. The data is daily and is divided in 4 periods: two periods are foreign exchange crises, the first semester of 1999 and the second semester of 2002, the period of no crises from July 1999 to April 2002 and the whole sample. P-values are under parentheses.

Dependent Variable: First Difference of the Net Aggregate Stock (Short Minus Long Positions in Dollars) of Foreign Exchange Swaps

	Foreign exchange crises		No crises	Whole sample
	1999/1	2002/2	07/1999 a 04/2002	1/1999 a 12/2002
Constant	76.23	-19.41	11.77	12.63
	(0.30)	(0.56)	(0.62)	(0.52)
Interventions of the Central Bank in the Derivatives Market	-1.40	-0.89	0.44	-0.05
	(0.46)	(0.53)	(0.05)	(0.64)
First Difference of the Foreign Exchange Coupon	5.55	3.96	2.37	3.88
	(0.42)	(0.12)	(0.63)	(0.05)
First Difference of the IBOVESPA	-0.37	-0.001	0.02	-0.0004
	(0.28)	(0.5)	(0.65)	(0.07)
First Difference of the Rate of Certificate of Deposits Between financial Institutions, CDI	60.30	-75.62	-19.30	34.30
	(0.0)	(0.94)	(0.06)	(0.01)
R2	0.63	0.46	1.48	0.45
Reset Test	(0.15)	(0.91)	(0.94)	(0.32)
F test	(0.08)	(0.01)	(0.00)	(0.04)
Observations	120	150	700	970

Table 4 Reaction of the First Difference of the Net Aggregate Stock (Short Minus Long Positions in Dollars) of the Foreign Exchange Swaps of Financial Institutions to the Interventions of the Central Bank of Brazil using Two Stage Least Squares

The dependent variable is the first difference of aggregate net stock (short minus long positions in dollars) of foreign exchange swaps of the financial institutions. The independent variables are the interventions of the Central Bank of Brazil, the first difference of the foreign exchange coupon, the first difference of the IBOVESPA and the first difference of the rate of certificate of deposits between financial institutions, CDI.We use as an instrument for the intervention the first lag of the depreciation of the nominal exchange rate. Below the estimated coefficients, in parenthesis are the p-values obtained using the Newey and West (1987) standard errors that control for possible heterocedasticity and autocorrelation of the residuals. The data is daily and is divided in 4 periods: two periods are foreign exchange crises, the first semester of 1999 and the second semester of 2002, the period of no crises from July 1999 to April 2002 and the whole sample. P-values are under parentheses.

Dependent Variable: First Difference of the Net Aggregate Stock (Short Minus Long Positions in Dollars) of Foreign Exchange Swaps

	Foreign Exchange Crises		**No crises**	**Whole sample**
	1999/1	**2002/2**	**07/1999 a 04/2002**	**1/1999 a 12/2002**
Constant	96.23	-21.41	10.77	20.63
	(0.30)	(0.46)	(0.52)	(0.32)
Interventions of the Central Bank in the Derivatives Market	-1.70	-0.79	0.54	-0.15
	(0.46)	(0.53)	(0.04)	(0.44)
First Difference of the Foreign Exchange Coupon	7.55	2.96	2.77	3.98
	(0.24)	(0.12)	(0.53)	(0.07)
First Difference of the IBOVESPA	-0.17	-0.131	0.08	-0.04
	(0.08)	(0.5)	(0.55)	(0.08)
First Difference of the Rate of Certificate of Deposits Between financial Institutions, CDI	50.30	-65.62	-21.30	44.30
	(0.0)	(0.94)	(0.16)	(0.0)
R2	0.22	0.16	0.13	0.08
Reset Test	(0.41)	(0.35)	(0.28)	(0.53)
F test	(0.03)	(0.00)	(0.01)	(0.02)
Observations	120	150	700	970