Pessimistic foreign investors and turmoil in emerging markets: The case of Brazil in 2002

Sandro C. Andrade
University of Miami

Emanuel Kohlscheen
Central Bank of Brazil

First version: October 2011
This version: June 2014*

Abstract

Using surveys of foreign exchange expectations, we document the emergence of a large gap between the beliefs of foreign banks and local-based institutions ahead of Brazil's 2002 presidential elections. That period was marked by a sudden stop in foreign capital flows and steep depreciation of Brazilian financial assets. While foreigners have their beliefs "marked to the market", locals forecasted a strong market rebound. The belief gap closed soon after the elections, as the president-elect reaffirmed the continuity of macroeconomic policy and markets rebounded, as locals had predicted. Trading data in Brazilian stock exchange are consistent with survey evidence. Our analysis supports the view that emerging market financial crises may be precipitated by non-structural reasons such as information frictions affecting foreign investors.

Keywords: self-fulfilling crises; capital flows; sudden stop; elections

*We are grateful to the Central Bank of Brazil, BM&F BOVESPA, and FX4casts for providing us with data. We thank Alan Teck and Marsha Kameron for answering questions about FX4casts data. We benefitted from discussions with Pedro Fachada, Alok Kumar, Carlos Madeira, José Ornellas, Alan Teck, Alex Wilson, Thomas Wu, and seminar participants at the University of Miami and at the ZEW Conference "The Role of Expectations in Financial Markets". All errors are ours. The views expressed in this work are those of the authors and do not necessarily reflect those of the Central Bank of Brazil or its members. E-mail: sca@miami.edu. Phone: 1 (305) 284-8819.

"As Brazilian analysts predict a post-election rally and some foreign analysts foresee a collapse, Brazil's markets remain extremely volatile."

The New York Times, October 12, 2002

1 Introduction

The crises of the 1990s engendered a substantial change of perspective in the analysis of emerging market crises. Before, crises were quickly attributed to macroeconomic mismanagement, particularly to unsustainable fiscal imbalances. Afterward, economists began to seriously consider that some crises may be precipitated by self-fulfilling pessimistic expectations of foreign lenders. For example, a number of prominent economists blamed foreign investors for their role in the 1997 East Asian emerging market crisis (Bhagwati, 1998; Stiglitz, 1998; Rodrik, 1998; Radelet and Sachs, 1998). Self-fulfilling lender-led crises can be rationalized by a variety of models, most of them exhibiting multiple equilibria. These models include Obstfeld (1986, 1996), Sachs, Tornell, and Velasco (1996), Cole and Kehoe (1996, 2000), Rodrik and Velasco (1999), Calvo and Mendoza (2000a,b), Chang and Velasco (2001), and Chang (2007).[1] However, there is little evidence supporting lenders' change-of-beliefs explanations for emerging market crises.[2]

This paper uses monthly surveys of expectations among financial institutions to study the role of foreign beliefs in the Brazilian 2002 crisis. One set of surveys is carried out among Brazilian institutions, while the other set takes place among non-Brazilian institutions, mostly London-based FX desks of global banks. We document the opening and subsequent closing of a dramatic gap between the beliefs of local and foreign institutions around Brazil's 2002 crisis. Before and after the crisis, locals' and foreigners' beliefs are closely aligned. However, at the peak of the crisis foreigners on average expected a further 9% *depreciation* of the Brazilian real over the subsequent year, while locals on average forecasted a 20% *appreciation* of the real.

A key advantage of our setting is the ability to mitigate concerns that surveys do not elicit true expectations. To wit, we show that survey-based belief differences are consistent with contemporaneous data on foreign versus local trading imbalances in the Brazilian stock market. Foreigners massively sold Brazilian stocks to locals in the period corresponding to

[1] See Masson (1999), Calvo (2005), and Kaminsky (2006) for discussions. Corsetti, Guimarães, and Roubini (2006) develop an unique-equilibrium model in which a crisis may arise due to bad fundamentals, or self-fulfilling lender runs, or an interaction of the two.

[2] Choe, Kho, and Stulz (1999) and Kim and Wei (2002) examine foreigner's trading data and conclude that foreign investors did not have a destabilizing effect on Korea' stock market during Korea's 1997 crisis.

the emergence of the belief gap between foreigners and locals. Foreigners began repurchasing such stocks from locals as soon as the belief gap closed. Moreover, the high-frequency association of foreign flows and stock prices suggests that the foreign sell-off did affect asset prices over and beyond contemporaneous news. Ten-day sub-periods of stronger foreign sell-off are associated with stronger depreciation of the Brazilian stocks, after controlling for contemporaneous returns in global stock markets and in Brazilian sovereign debt.

The historical record indicates that the Brazilian 2002 crisis, and the related emergence of a belief gap between locals and foreigners, was caused by the 2002 Brazilian presidential election. In particular, relative to locals, and relative to *ex post* events, foreigners' were excessively fearful of a left-wing electoral victory. Foreigners feared that Lula would institute policy changes resulting in sovereign default and high inflation. This occurred despite the fact that, throughout his 2002 campaign, Lula repeatedly sent public signals that he would retain the macroeconomic framework of previous administrations. The historical record suggests that the cross-border belief gap occurs because, unlike locals, foreigners judged the Lula of 2002 by the actions and words of the Lula of 1989 or 1994. This fear brought about the sudden stop of foreign capital flows, and associated foreign sell-off of Brazilian assets, which exacerbated crashes in Brazilian currency and stock markets.

This paper thus provides evidence that cross-border belief differences, and in particular the emergence of (relative) pessimism among foreign lenders, can play a role in emerging market crises. It thus supports multiple-equilibria models in which sudden changes in beliefs, not necessarily justified by corresponding changes in fundamentals, can bring about crises. The vulnerability of developing countries' economies to sudden changes in foreign lenders' beliefs creates a role for the provision of official assistance by multilateral organizations such as the International Monetary Fund.

1.1 Related literature

As discussed in the Introduction, this papers contributes to the large literature on emerging market crises. There are two alternative perspectives for such crises. The fundamentals perspective views crises as pre-ordained, inescapable consequences of structural problems (e.g., Krugman 1979; Burnside et al. 2001). In the "panic" perspective, in contrast, crises may or may not occur depending on self-fulfilling expectations of foreign lenders (e.g., Cole and Kehoe 1996, Sachs et al. 1996, Chang and Velasco 1998). In particular, exogenous shifts in foreign investors' sentiment, not necessarily commensurate to changes in fundamentals, can precipitate crises as runs on a country's currency, much like Diamond and Dybvig's (1983) seminal work on bank runs. Much of this debate is purely theoretical, as beliefs

are hard to directly observe. By using belief surveys, and showing that foreigners were pessimistic relative to locals and to (*ex post*) events, we provide empirical evidence for the "panic" perspective on emerging market crises.

More narrowly, we add to the literature on capital flows volatility around developing country elections. The extant literature on volatility around elections includes Leblang (2002), Block and Vaaler (2004), Vaaler et al. (2005), Bernhard and Leblang (2006), Vaaler (2008), and Chang (2007, 2010). This literature typically sees volatility in flows and financial market prices around developing country elections in light of partisan political economy models. These models postulate right- and left-wing politicians with starkly different macroeconomic policies. In particular, left-wing politicians, focusing on redistribution, embrace policies that harm investors. Thus, for example, it makes sense for foreign investors to withdraw from emerging markets as it appears likely that a left-wing challenger will take office, and for asset prices to drop accordingly.

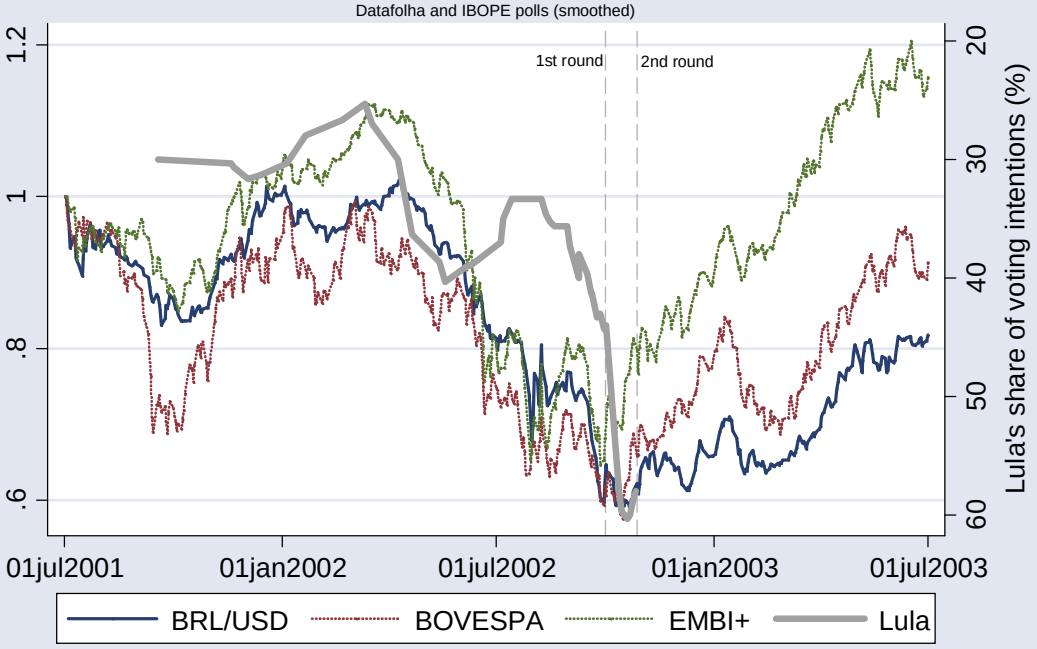
However, our analysis suggests that macroeconomic policy differences between "right" and "left" wing candidates may be largely *perceived* by foreigners rather than real. In our case, unlike locals, foreigners perceived large policy differences between Lula and the then current government. Such foreign perceptions failed to materialize *ex post*. Accordingly, emerging financial markets can display *excess* volatility around elections because of foreign investors' overreaction to the prospect of policy change. Our results suggest that information frictions affecting foreign investors, rather than just the prospect of policy changes, may contribute to the increased financial market volatility around elections. This pattern is consistent with Calvo and Mendoza's views (2000a, 2000b) on emerging market financial crises in general.

2 Background: Elections, volatility and Sudden Stop

Figure 1 shows that Lula's rise in the polls was associated with a dramatic weakening of the Brazilian real relative to the U.S. dollar, and strong depreciations of Brazilian assets. We plot the normalized price levels of the BRL/USD exchange rate, of Brazilian stocks (in local currency), and of US dollar-denominated Brazilian sovereign bonds.[3] From mid-March 2002 to the first round of the Brazilian elections on October 6, 2002, Lula's voting intentions rose from 25% to 46%, more than 20 percentage points ahead of the first round runner up José

[3]Several news outlets reported the association of electoral polls and financial markets during the 2002 campaign. For example, *The Economist* reported in September 26, 2002 : "Brazil's Real fell to all-time low this week, dragging other Latin American currencies down with it, as Luis Inacio Lula da Silva of the left-wing Workers' Party maintained a strong lead in the polls before the presidential election on October 6th".

Figure 1: Lula's polls (inverted scale), and FX, stock, and sovereign bond markets



EMBI+ scaled by U.S. corp. bond index. Financial market figures normalized to 1 in July 1st, 2001

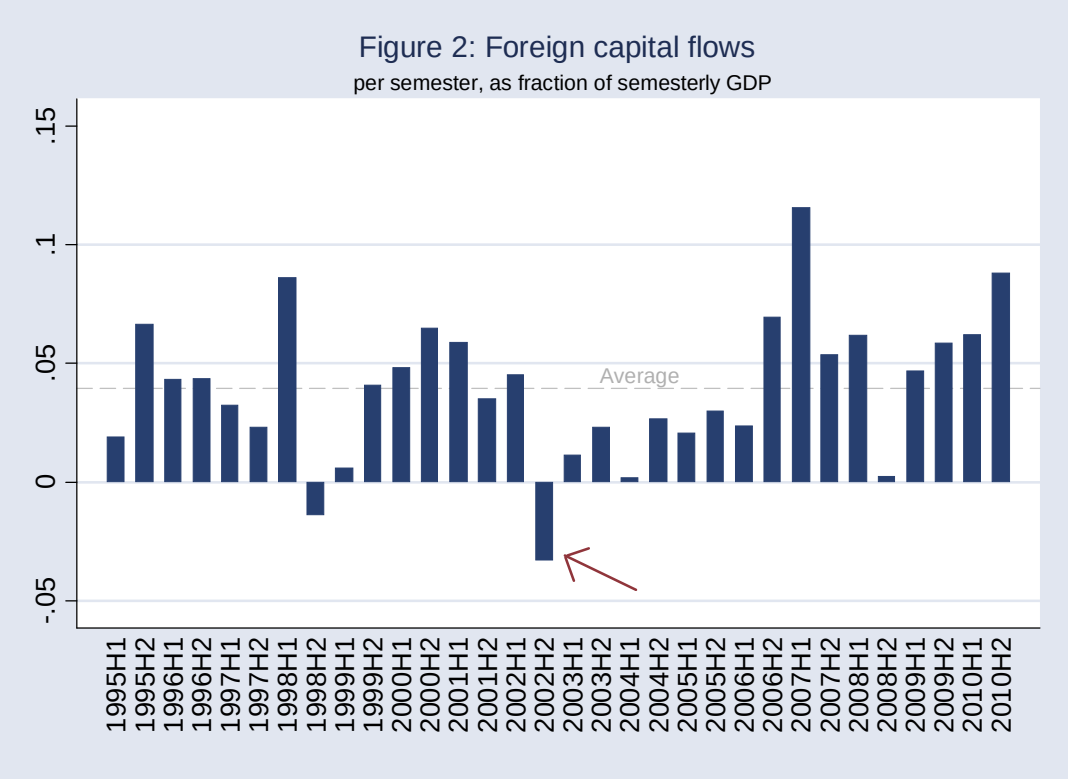
Serra.[4] During the same six-month time period, the Brazilian real and the local stock market depreciated by 40%, and Brazilian dollar-denominated sovereign bonds returned -35% (the flip side of an increase in sovereign yield spreads from 700 to 2400 basis points).

Figure 1 also shows that markets started to rebound shortly after Lula's second round victory on October 27, 2002. Immediately following the election. president-elect Lula reaffirmed his commitment to macroeconomic continuity, consistent with his campaign discourse. In particular, before taking office Lula appointed well-known and market friendly Finance Minister and Central Bank Governor, announced an increase in the primary budget surplus target, and renewed vows to respect the Central Bank's *de facto* independence.

Figure 2 shows a large and sudden decrease in the availability of foreign capital for the Brazilian economy in the second half of 2002.[5] From 1995:H1 to 2010:H2, foreign capital entering Brazil in the form of Foreign Direct Investment, portfolio investment, or loans averaged 3.9% of GDP. In contrast, in the 2002:H2 FDI dried up substantially, at the same time that foreigners massively sold Brazilian fixed income and equity securities and cut lines of credit to Brazilian firms, repatriating large amounts of capital. In aggregate, foreign

[4] Presidential elections in Brazil occur in two rounds. In the second round, three weeks after the first round, the winner and runner up in the first round face off.

[5] We use IFS data, and following Rothenberg and Warnock (2011), plot Gross Financial Inflows as the sum of FDI (line 78bed), portfolio investment (line 78bgd), and other investment flows (line 78bid). Flows from official lenders such as the IMF are not included in line 78bid. See also Forbes and Warnock (2011).



capital flows added to -3.3% of GDP. This local-event driven "sudden stop" in foreign capital flows in 2002:H2 is more dramatic than the ones associated with the LTCM and Lehman Brothers crises, in 1998:H2 and 2008:H2, respectively.

3 Cross-border disagreement

We use two monthly surveys of foreign exchange expectations to study beliefs about the Brazilian economy around the 2002 presidential election.[6]

Local surveys

The first monthly survey is conducted by the Central Bank of Brazil among institutions located in Brazil. The Central Bank asks institutions to forecast the BRL/USD exchange rate for different periods in the future, including the one-year horizon that we focus on. Aggregate results of such surveys are available in the central bank's website. The forecasts of individual institutions, to which we have access under a non-disclosure agreement with the Central

[6] A growing literature analyses surveys of foreign exchange expectations. Most of this literature focuses on the properties of aggregate survey results (e.g., Frankel and Froot (1987) and Gourinchas and Tornell (2004)). A few papers, like us, focus on forecast differences across survey respondents (e.g., Macdonald and Marsh (1996) and Jongen et al. (2012)). To the best of our knowledge, ours is the first paper to document cross-border differences in average exchange rate forecasts.

Bank of Brazil, are kept confidential. The identity of the five best forecasting institutions over the recent past is widely publicized on a regular basis to incentivize institutions to input their best forecasts. On average, there are 31 different institutions issuing one-year foreign exchange forecasts each month in our sample period of November 2001 to February 2005. Most of these are financial institutions or economic consulting firms (86% and 11%, respectively). We have the exact day in which each forecast is inputted, and, in order to better align the timing of the local surveys with the timing of the foreign surveys described below, we drop from the sample the (relatively few) forecasts that are inputted in the system before the 21^{st} day of each month.[7]

Foreign surveys

Our second monthly survey is conducted by the firm FX4casts. FX4casts surveys FX desks of global financial institutions, mostly located in London. Data from FX4casts have been used in academic research by Gourinchas and Tornell (2004) and Bacchetta, Mertens, and van Wincoop (2009), among others. The firm has gathered monthly one-year forecasts for the Brazilian currency in the last week of each month since September 2001. In private communication with us, Alan Teck from FX4casts states that the number of institutions forecasting the BRL/USD exchange rate from September 2001 to June 2003 ranges from 14 to 20. We have the average forecast and its standard deviation each month, as well as the spot BRL/USD exchange rate of the day in which the forecasts were gathered.[8]

Figure 3 illustrates the paper's key result. We plot 95% confidence intervals for the average forecasted BRL appreciation from local and foreign surveys each month.[9] Positive values imply strengthening of the Brazilian real relative to the US dollar, and negative values imply weakening of the real. The average forecasted BRL appreciation in either survey, not explicitly shown in the picture, lies exactly in the middle of the corresponding interval. The depreciation implied by Uncovered Interest Parity (i.e., the one-year forward exchange rate) is also displayed, for reference. Note that UIP implies strong depreciations, because interest rates are much higher in Brazil than in the United States throughout the sample.

[7] The overwhelming majority of institutions enter their forecasts in the last week of each month because. In addition to better aligning the timing of the local surveys to the timing of the foreign surveys, the non-public data we have access to allows us to compute the number of institutions entering one-year ahead forecasts each month. The number of monthly forecasts, information required to calculate the standard deviations of the average monthly forecasts, is not available at the central bank's website.

[8] FX4casts actually divulges three figures: the "consensus" forecast, and the "weakest" and "strongest" forecasts. The firm defines the weakest and strongest forecasts are "distributions of individual forecasts at 95% confidence intervals". It is possible to calculate the sample average forecast as the average between the weakest and the strongest forecasts ($\frac{1}{2}(\mu + 1.95\ \sigma + \mu - 1.95\ \sigma)$), and the standard deviation of the forecasts as difference between the strongest and weakest forecasts divided by 3.9 ($\frac{1}{3.9}(\mu + 1.95\ \sigma - (\mu - 1.95\ \sigma))$). The consensus forecast, which we don't use in this study, is defined as the geometric average of the forecasts.

[9] We compute the depreciation relative to the spot rate on the day that each of the forecasts was gathered. Results are similar and conclusions unchanged if we use the spot rate on the last day of each month for all forecasts.

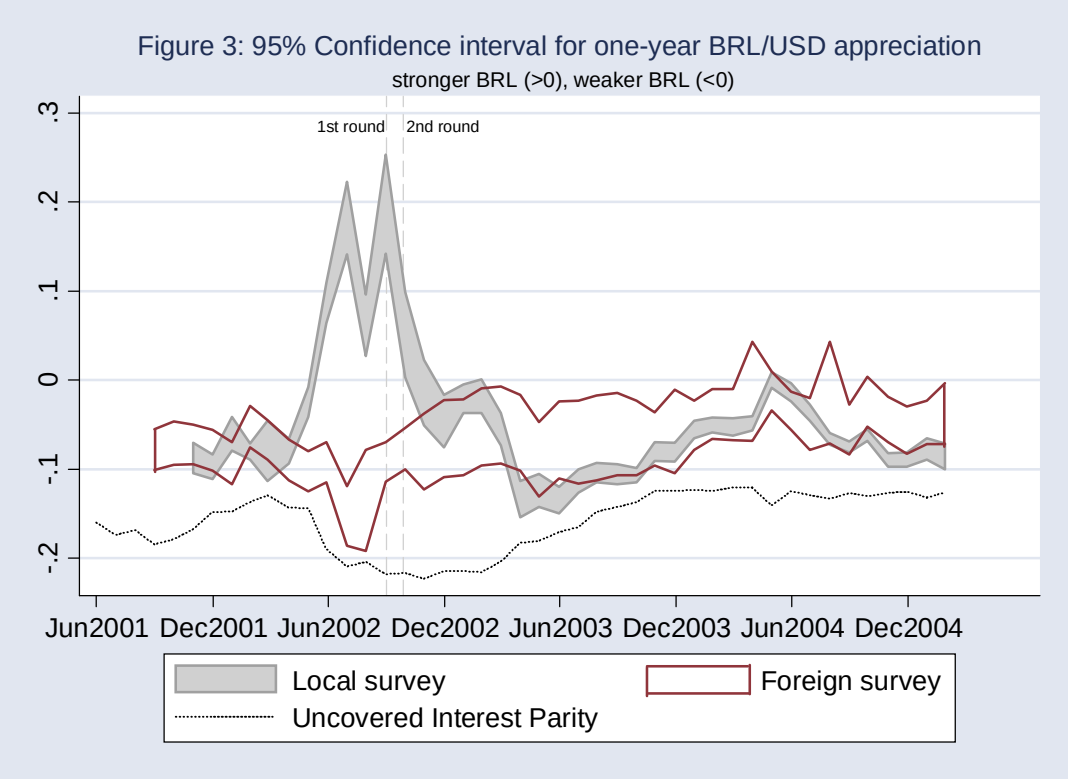


Figure 3 shows the opening and subsequent closing of a gap between the beliefs of local and foreign institutions. Before May 2002, locals and foreigners held statistically equal average beliefs. In contrast, beliefs strongly diverged in the six surveys from May 2002 to October 2002. Note that the forecast differences in that period are economically large in addition to being statistically significant. For example, at the end of September 2002, right before the first round of the elections, and after the Brazilian currency had already depreciated by 40% in the previous six months (see Figure 1), the 95% confidence interval for foreign forecasts calls for a 7% to 12% further *depreciation* of the Brazilian real over the subsequent one-year period, whereas the 95% confidence interval for Brazilian forecasts sees an *appreciation* of the real from 14% to 25%.[10] Brazilian institutions expected a strong rebound of the Brazilian real, partially reversing the strong devaluation that had started in March 2002 (see Figure 1). In contrast, foreign institutions appear to have largely "marked their beliefs to the market", as the distance foreign expectations and devaluations implied by the forward rate does not vary too much over time.

[10] Unfortunately, we don't have the individual foreign forecasts from the foreign surveys, only the aggregate statistics. Seeking external validation for the apparent relative pessimism of the foreign surveys, we obtain the October 8, 2002 edition of Goldman Sachs' Global FX Analyst publication, the edition that is closest to the end of September. In that edition, Goldman's forecast for the price of 1 USD in BRL 12 months in the future is 4.40, which is identical to the "weakest" BRL forecast in FX4casts's survey at the end of September 2002.

Table 1: Average forecasted BRL appreciation over the subsequent year

		Nov/2001-Apr/2002	May/2002-Oct/2002	Nov/2002-Feb/2005
Local Surveys	point estimate	-0.081	0.093	-0.069
	95% conf. interval	(-0.098 , -0.063)	(0.056 , 0.129)	(-0.082 , -0.056)
Foreign Surveys	point estimate	-0.076	-0.110	-0.052
	95% conf. interval	(-0.098 , -0.052)	(-0.078 , -0.138)	(-0.088, -0.014)
Forward rate	point estimate	-0.145	-0.197	-0.151

Table 1 summarizes the key information in Figure 3. From November 2001 to April 2002, local-based and foreign-based institutions predicted an average one-year depreciation of the BRL of 8.1% and 7.6% respectively. The difference is not statistically significant. Expectations diverge starting in May 2002. From May to October 2002, on average, locals forecasted a 9.3% *appreciation* of the Brazilian currency over the subsequent one-year period, whereas foreigners forecasted a 11.0% *depreciation*. Expectations re-converge shortly after the elections. From November 2002 to February 2005, Brazilian and foreign forecasters on average predict a 6.9% and 5.2% depreciation of the BRL, respectively. Note that the difference between foreign forecasts and the forecasted based on the forward rate does not vary much over time, which suggests that foreigners have "marked their beliefs to the market" throughout the sample period.

3.1 Does fear of political backlash explain local surveys?

Our interpretation of Figure 3 and Table 1 is premised on the idea that local and foreign surveys do elicit expectations from local and foreign investors, respectively. An alternative explanation of our results is based on the assumption that the large gap in forecasts between locals and foreigners is due to differences in strategic behavior across local and foreign forecasters. For example, local forecasters could fear some form of political backlash if they input negative forecasts. However, there are four arguments supporting the idea that local forecasts are not driven by the desire to curry government favors or avoid government punishment.

First, trading imbalance data from the Brazilian stock exchange is consistent with the emergence and subsequent disappearance of the belief gap between foreigners and locals shown in Figure 3. We discuss these data in detail in Section 5. The data show that foreigners massively sold Brazilian stocks to locals in the six month period ahead of the

elections, and repurchased the stocks soon after the elections. If the "true" expectations of locals were identical to those of foreigners throughout time, in principle we would not expect to see these trades taking place.[11]

Second, given the explicit signals sent by the Central Bank of Brazil, there seems to be little reason for institutions participating on the central bank surveys to fear political backlash. The Central Bank of Brazil repeatedly signals that it wants the participating institutions to input their best forecasts, and rewards the most accurate forecasters by making their names public on a regular basis. As discussed by Bogdanski et al. (2000) and Carvalho and Minella (2012), it is widely known that surveys of market expectations are an important component of the Brazil's inflation targeting framework for monetary policy. Therefore, Brazilian institutions could justify any bearish forecasts by appealing to the explicit signals sent by the Central Bank and the logic of Brazil's monetary policy framework.

Third, the behavior of individual forecasters suggest that they care about the accuracy of their forecasts. The Central Bank has an electronic system for collecting forecasts. Institutions can choose to input forecasts in the system at any point during the month, but, for the purpose of forming ranks of forecasters, forecasts are only tallied at the end of each month. It turns out that forecasters overwhelming wait until the end of each month to input their forecasts. The most reasonable explanation for this behavior is that forecasters wish their forecasts to use as much information as possible (e.g., input forecasts only after observing the current level of the spot exchange rate at the end of the month). Similarly, Carvalho and Minella (2012) present a thorough analysis of the *inflation* (not currency) forecasts in the Central Bank of Brazil's surveys. They study a long time period that includes ours. The authors show that survey forecasts have better predictive performance than autoregressive statistical models, which suggests that forecasters are using more information than that contained in standard forecasting data sets.

Fourth, note that outside the election period, the forecasts of local forecasters are very close to those of foreigners. That is, there is no evidence that local forecasters consistently attempt to paint a rosy picture of the future because they are responding to incentives to tell authorities what they want to hear.

[11] Note that home bias in equity portfolios suggests that Brazilian investors care more about Brazil risk than foreign investors. Therefore a non-informational, risk-sharing motivation for trading would predict foreign *purchases* from locals in times of great uncertainty, as opposed to the foreign *sales* to locals observed in the data.

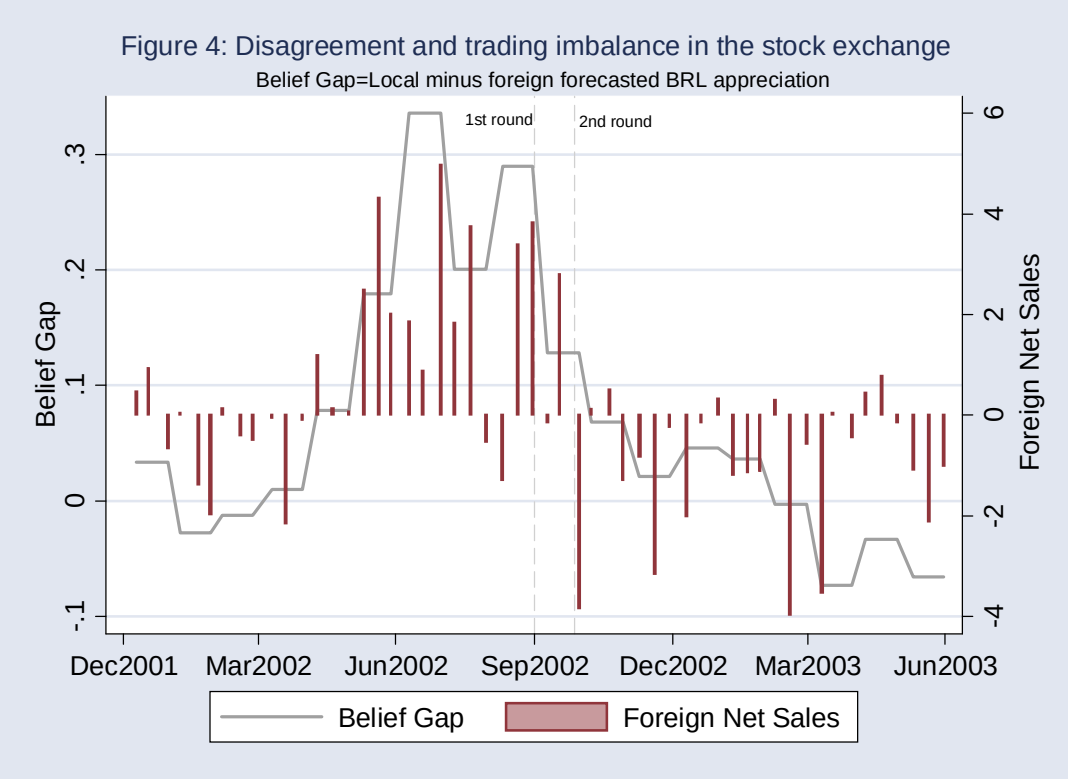
4 Trading imbalances confirm the belief gap

Trading imbalance data from the Brazilian stock exchange is consistent with the emergence and subsequent disappearance of the belief gap between foreigners and locals shown in Figure 3. The data show that foreigners massively sold Brazilian stocks to locals in the six month period ahead of the elections, only to repurchase the stocks from locals soon after the elections.

Brazil's BOVESPA Stock Exchange classifies each participant in a stock trade as a domestic or a foreign trader. The exchange divulges data on the BRL amount transacted by each type of trader in both stock purchases and stock sales separately. The data is aggregated across all stocks in non-overlapping 10-day periods adding up to 3 periods per calendar month and 36 periods per calendar year. We construct a *Foreign Net Sales* trading imbalance measure in two steps. First, we subtract the total BRL volume of buys by foreigners from the total BRL volume of buys by foreign investors in a given 10-day period. Then we divide the difference by the level of the IBOVESPA stock index at the end of each 10-day period. We scale by the IBOVESPA level because we want the quantity of stocks that foreigners sold, rather than just the monetary values associated with the sales.

Figure 4 plots the *Foreign Net Sales* over time. Positive values of *Foreign Net Sales* indicate that foreigners are net sellers of stocks to locals in the last 10 calendar days, and negative values indicate that foreigners are net buyers of stock from locals. Figure 4 also shows the variable *Belief Gap,* defined as the difference of one-year ahead exchange rate appreciation forecasts across locals and foreigners. Therefore, *Belief Gap* is the difference between the mid-points of the confidence intervals show in Figure 3. A positive *Belief Gap* thus indicates that locals are more optimistic about the strength of the Brazilian Real than foreigners, or, equivalently, that foreigners are pessimistic relative to locals. Of note, *Foreign Net Sales* and *Belief Gap* are measured at different frequencies. While *Foreign Net Sales* is available for non-overlapping 10-day intervals (adding up to three observations per calendar month), *Belief Gap* is available monthly, because it is based on monthly surveys of expectations. The different periodicity is the reason why *Belief Gap* looks like a step function in Figure 4.

Figure 4 shows that *Foreign Net Sales* parallels *Belief Gap*. That is, foreigners sell to locals (positive *Foreign Net Sales*) when they are pessimistic relative to locals (positive *Belief Gap*). The belief gap and foreign sell-off emerge around May 2002, and start to disappear soon after the second round of the election in late October 2002. At that point, foreigners undo their selling and start to repurchase stocks from locals.



4.1 Trading imbalances and price movements

Did the foreign sell-off, fueled by the emergence of foreigners' pessimism, impact the prices of Brazilian assets? In this section we explore this question using our *Foreign Net Sales* variable. Note that the answer should be clear from first principles. In any asset pricing model, the equilibrium price is averaged across beliefs of market participants (e.g., Rubinstein 1974). If one group of investors suddenly becomes more pessimistic, it follows that prices will drop (e.g., Dunne et al. 2010). In contrast to this clear-cut theoretical prediction, empirically establishing that foreign sales *causes* price drops is very difficult if not impossible. Clearly, if foreign sales to locals were unrelated (or positively related) to contemporaneous stock returns, it would be unlikely that foreign sales exacerbates price declines. But even if foreign sales are contemporaneously negatively related to stock returns, it is also possible that a third omitted variable (e.g., bad news) causes both foreign sales to locals and price declines.

In this section we show that *Foreign Net Sales* are indeed contemporaneously negatively correlated to Brazilian stock returns. We don't claim to empirically establish unequivocal causation, but we mitigate endogeneity concerns by including controls for news about global stock markets and news about the Brazilian economy. More specifically, we regress returns on the Brazilian stock market onto the amount of contemporaneous net foreign sales to locals, controlling for contemporaneous returns in global stock markets and contemporaneous

Table 2:

Panel A: Summary statistics

	Mean	Median	St. Dev.	N
Foreign Net Sales	-0.49	-0.44	1.92	113
BOVESPA returns (%)	0.77	1.46	4.96	113
MSCI returns (%)	0.18	0.33	2.54	113
EMBI+ Brazil returns (%)	0.68	0.99	4.17	113

Panel B: Correlations

	Foreign Net Sales	BOVESPA ret	MSCI ret	EMBI+ Brazil ret
Foreign Net Sales	1			
BOVESPA returns	-0.50	1		
MSCI returns	-0.28	0.49	1	
EMBI+ Brazil returns	-0.37	0.72	0.28	1

returns in the Brazilian sovereign debt market. To the best of our knowledge, this approach is novel to the literature studying the interplay between foreign trading and local market returns (e.g., Choe, Kho, and Stulz 1999; Kim and Wei, 2002). In total, we have 113 10-day observations of *Foreign Net Sales* from January 2002 to February 2005. We also collect 10-day interval and monthly returns on the IBOVESPA stock index, the MSCI World Stock Index, and the EMBI+ Brazil sovereign bond index. Table 2 has summary statistics.

Table 3 shows that 10-day interval *BOVESPA returns* are contemporaneously associated with *Foreign Net Sales*. In Column (1) we show the raw association, without controlling for contemporaneous news. The negative and statistically significant coefficient on *Foreign Net Sales* implies that Brazilian stock prices go down as foreigners sell stock to locals. In Columns (2) and (3) we separately use *MSCI returns* to control for contemporaneous news about global stock markets, and *EMBI+ Brazil returns* to control for contemporaneous news about the Brazilian economy in particular. The coefficient on *Foreign Net Sales* remains statistically significant at the 1% level in both cases. In Column (4) we add both *MSCI returns* and *EMBI+ Brazil returns* as explanatory variables, and the coefficient on *Foreign Net Sales* remains significant at the 5% level. We note that the coefficient on *Foreign Net Sales* in Column (4) of Table 3 is economically in addition to being statistically significant. Using the standard deviations in Table 2 and the regression coefficient on Column (4) of Table 3, we find that a one standard deviation increase in *Foreign Net Sales* is associated with a $(-0.55 \times 1.92 \div 4.96) = -0.21$ standard-deviation decrease in *BOVESPA returns*.

Table 3: Regressions of BOVESPA returns

Dep. Var. BOVESPA returns	(1)	(2)	(3)	(4)
Foreign Net Sales	-1.28 ***	-1.01 ***	-0.68 ***	-0.55 **
	(-6.38)	(-4.48)	(-3.76)	(-2.51)
MSCI returns		0.73 ***		0.51 ***
		(4.34)		(2.92)
EMBI+ Brazil returns			0.744 ***	0.677 ***
			(5.49)	(6.20)
Constant	0.14	0.15	-0.04	-0.02
	(0.35)	(0.33)	(-0.13)	(-0.07)
R^2-adj	0.24	0.37	0.58	0.63
N	113	113	113	113

This table contains results of regressions of returns in the Brazilian stock market onto explanatory variables. The sample has 113 10-day intervals from January/2002 to February/2005. *Foreign Net Sales* is calculated using trading imbalance data from the BOVESPA stock exchange, as described in the text. We report Newey-West standard errors with one lag. * Significant at 10%; ** significant at 5%; *** significant at 1%.

5 The nature of cross-border disagreement

The historical record shows that the source of belief gap between foreigners and locals was disagreement over Lula's future macroeconomic policy if elected.[12] Locals expected Lula to retain the basic macroeconomic framework of his predecessors. In contrast, foreigners feared increased budget deficits and a politically motivated default on foreign debt.

Locals updated their beliefs about Lula based on an accumulation of public signals sent by the candidate since the beginning of his 2002 campaign. In speeches and political propaganda material, Lula distanced himself from the heated rhetoric of previous presidential campaigns (specially 1989 and 1994), positioning himself as a moderate (Samuels, 2004; Hunter, 2007). Lula's party substantially broadened its alliance strategy for the 2002 campaign, including teaming up with the centrist Liberal Party, which nominated Lula's vice-presidential candidate. In June 22, 2002, Lula released the "Letter to the Brazilian People" (BBC News, 2002) in which he pledged to honor contracts, pay down Brazil's debts, and keep government spending and inflation under control.[13] In the first week of August 2002, Lula co-signed (with President Cardoso and incumbent candidate José Serra) a new agreement with the IMF committing to a primary budget surplus of 3.75% of GDP over the course of the subsequent three

[12] Like Romer and Romer (1989), this sub-section is based on qualitative evidence derived from the historical record.
[13] For further discussion of the importance of the "Letter to the Brazilian People", please see Samuels (2004, p.1004).

years.

In line with Lula's new discourse, locals locals largely expected a continuation of the macroeconomic framework of previous administrations. As early as May 2002, Brazilian political analysts discussed Lula's "rupture" with the heated discourse of previous electoral campaigns (Exame, 2002). In August 5, 2002 the BOVESPA stock exchange president stated that "Lula does not provoke any fears anymore" (Isto É, 2002). The New York Times (2002) quotes different Brazilian economists dismissing concerns about a Lula's potential victory, on the basis that "Lula is not a revolutionary"and "Brazil's government [under Lula] will not default on its external obligations".

Foreigners, in contrast, feared default on sovereign debt and the return of very high inflation despite of Lula's explicit signals of macroeconomic continuity. Martinez and Santiso (2003) document how foreign investment banks turned pessimistic as the election approached. For example:

- May 24, 2002: BCP Securities issued a report stating that "there seems to be a sense of panic as economic agents realize that Lula will win the elections" (BCP, 2002)

- June 6, 2002: Goldman Sachs announced the Lulameter, a model which "quantifies the probability of a Lula victory that is currently being priced in by currency markets", and recommends that "investors should protect against BRL exposure into the elections period" (GS, 2002).

- June 26, 2002: Credit Suisse First Boston stated that it "continue[s] to recommend clients to reduce exposure [to Brazil] ahead of the election", as "the widespread perception among market participants seems to be that a Lula presidency would put Brazil on a path towards defaulting on its external debt" (CSFB, 2002).

- August 20, 2002: Salomon Smith Barney reported its new macroeconomic forecast for Brazil, now featuring a left-wing victory in the coming elections, and resulting lower GDP growth, higher inflation, and stronger currency depreciation (SSB, 2002).

The disagreement between local and foreign analysts regarding Lula's future policies was apparent to some observers. Two weeks before the election's second round, the New York Times (2002) reported:

> "Wall Street investors, stung by recent losses in Argentina and wary of the outcome of presidential elections in Brazil, are once again diverging from their Brazilian counterparts in their outlook on the nation's ability to avoid a crippling

financial crisis. The differences in opinion - on the chances of a default on Brazil's sizable public debt and a return of high inflation - have become more striking since Luiz Inácio Lula da Silva, the presidential candidate of the left-leaning Workers' Party, was forced on Sunday into a second round of voting with José Serra, the candidate of the centrist governing party. Ahead of runoff elections scheduled for Oct. 27, some Wall Street analysts are imagining catastrophic situations involving the quickening of capital flight, a drastic weakening of Brazil's foreign currency, the real, and the introduction of strict controls on foreign capital" .

Despite strong pre-electoral signals sent by Lula, the belief gap between locals and foreigners only closed after the second round of the 2002 election. Immediately after winning the election, before taking office, president-elect Lula sent additional signals that he would retain the macroeconomic framework of previous administrations. For example, before taking office Lula appointed a well-known and market friendly economic team, announced an increase in the primary budget surplus target, and renewed vows to respect the Central Bank's *de facto* independence. As the belief gap closed, Brazilian asset prices rebounded, as locals had predicted.

The historical record indicates that, consistent with Calvo and Mendoza's (2000a, 2000b) view on emerging market crises, it appears that at least part of foreigners' large *ex post* expectational errors was due to some form of *ex ante* information processing friction as opposed to being fully attributable to "bad luck". Specifically, as we have demonstrated, president-elect Lula's post-election signals of macroeconomic continuity should not be surprising to foreign investors at all. It appears that, unlike locals, foreign investors failed to update their beliefs regarding a Lula's presidency in response to public signals accumulated over the entire 2002 electoral campaign.

6 Conclusion

Using surveys of foreign exchange expectations, we document the opening and subsequent closing of a dramatic gap between the beliefs of local and foreign institutions around Brazil's 2002 presidential elections. Immediately before the elections, in the wake of 40% exchange rate depreciation over the previous six months, foreigners on average expected a further 9% *depreciation* of the Brazilian real over the subsequent year. In contrast, locals on average forecasted a 20% *appreciation* of the real. The belief gap closed soon after the election.

Trading imbalance data from the Brazilian stock exchange is consistent with survey ev-

idence. Foreigners massively sold stocks to locals in the six-month before the election, and began repurchasing stocks soon after it. The opening and closing of the belief gap, and ensuing sudden changes in the direction of foreign capital flows, can help explain the large price swings around the Brazilian 2002 election.

The historical record indicates that the belief gap was driven by foreigners' excessive fear of a left-wing electoral victory. Foreigners feared that Lula would institute policy changes resulting in sovereign default and high inflation, despite the fact, throughout his 2002 campaign, Lula sent public signals that he would retain the macroeconomic framework of previous administrations. It appears that the belief gap occurs because, unlike locals, foreigners judged the Lula of 2002 by the actions and words of the Lula of 1989 or 1994. Our analysis thus supports the view that emerging market crises may be precipitated by non-structural reasons such as information processing frictions on the part of foreign investors.

References

Bacchetta, Philippe, Elmar Mertens, and Eric van Wincoop (2009) "Predictability in Financial Markets: What Do Survey Expectations Tell Us?" *Journal of International Money and Finance* 28, 406-426

BBC News (2002) "Brazil's Labour Leader Reassures Investors" BBC News World Edition, June 24, 2002.

BCP Securities (2002) *Da Lula Monster*. May 24, 2002.

Bernhard, William and David Leblang (2006) *Democratic Processes and Financial Markets: Pricing Politics*. Cambridge University Press.

Block, Steven and Paul Vaaler (2004) "The Price of Democracy: Sovereign Risk Ratings, Bond Spreads and Political Business Cycles in Developing Countries" *Journal of International Money and Finance* 23, 917-946.

Bogdanski, Joel, Alexandre Tombini, and Sérgio Werlang (2000) "Implementing Inflation Targeting in Brazil" Central Bank of Brazil Working Paper.

Burnside, Craig, Martin Eichenbaum, and Sergio Rebelo (2001) "Prospective Deficits and the Asian Currency Crisis" *Journal of Political Economy* 109, 1155-1198.

Calvo, Guillermo A. and Enrique Mendoza (2000a) "Capital-Markets Crises and Economic Collapse in Emerging Markets: An Informational Frictions Approach," *American Economic Review* 90, 59-64.

Calvo, Guillermo A. and Enrique Mendoza (2000b) "Rational Contagion and the Globalization of Securities Markets" *Journal of International Economics* 51, 79-113.

Calvo, G.A. (2005) *Emerging Markets in Turmoil: Bad Luck or Bad Policy?* MIT Press.

Carvalho, Fabia A. and André Minella (2012) "Market Forecasts: A Prismatic Assessment of Performance, Epidemiology, and Determinants" *Journal of International Money and Finance* 31(6), 1371-1391.

Chang, Roberto and Andrés Velasco (1998) "Financial Crises in Emerging Markets: A Canonical Model" NBER Working paper 6606.

Chang, Roberto (2007) "Financial Crises and Political Crises". *Journal of Monetary Economics* 54, 2409-2420.

Chang, Roberto (2010) "Elections, Capital Flows, and Politico Economic Equilibria," *American Economic Review* 100, 1759-77.

Choe, Hyuk, Bong-Chan Kho, and René Stulz (1999) "Do Foreign Investors Destabilize Stock Markets? The Korean Experience in 1997" *Journal of Financial Economics* 54, 227-264.

Cole, Harold and Patrick Kehoe (1996) "A Self-Fulfilling Model of Mexico's 1994-95 Debt Crisis" *Journal of International Economics* 41, 309-330.

Cole, H.L. and T.J. Kehoe (2000) "Self-fulfilling Debt Crises". *Review of Economic Studies* 67, 91-116.

Corsetti, Giancarlo, Bernardo Guimaraes, and Nouriel Roubini (2006) "International Lending of Last Resort and Moral Hazard: A Model of IMF's Catalytic Finance" *Journal of Monetary Economics* 53, 441-471.

Credit Suisse First Boston (2002) "Brazil: Risk Aversion Hits Bonds" Emerging Markets Research. June 26, 2002.

Diamond, Douglas and Philip Dybvig (1983). "Bank Runs, Deposit Insurance, and Liquidity". *Journal of Political Economy* 91, 401–419.

Dunne, Peter, Harald Hau, and Michael Moore (2010) "International Order Flows: Explaining Equity and Exchange Rate Returns" *Journal of International Money and Finance* 29, 358-386.

Exame (2002) "The Workers' Party necessary rupture ... with itself". *Revista Exame*, n. 767, May 25, 2002.

Frankel, Jeffrey and Kenneth Froot (1987) "Using survey data to test standard propositions regarding exchange rate expectations" *American Economic Review* 77, 133-153.

Goldman Sachs (2002) "The Lulameter" *Emerging Markets Strategy* Issue N. 02/10, June 06, 2002.

Gourinchas, Pierre-Olivier and Aaron Tornell (2004), "Exchange Rate Puzzles and Distorted Beliefs" *Journal of International Economics* 64, 303-333.

Hunter, Wendy (2007) "The Normalization of an Anomaly: The Workers' Party in Brazil" *World Politics* 59, 440-475.

International Monetary Fund (2002) "IMF Managing Director Köhler Confirms Agreement with Brazil" News Brief No. 02/85, August 7, 2002

Isto É (2002) "Lula: Capitalism for Results" *Revista Isto É,* N. 1715, August 9, 2002.

Jongen, Ron, Willem F.C. Verschoor, Christian C.P. Wolff, and Remco C.J. Zwinkels (2012) "Explaining Dispersion in Foreign Exchange Expectations: A Heterogenous Agent Approach" *Journal of Economic Dynamics and Control* 36(5), 719-735.

Kaminsky, G. (2006) Currency crises: Are they all the same? *Journal of International Money and Finance* 25, 503–527.

Kim, Woochan and Shang-Jin Wei (2002b) "Offshore Investment Funds: Monsters in Emerging Markets?" *Journal of Development Economics* 68, 205-224.

Krugman, Paul (1979) "A Model of Balance of Payments Crises," *Journal of Money, Credit, and Banking* 11, 311-325.

Leblang, David (2002) "The Political Economy of Speculative Attacks in the Developing World" *International Studies Quarterly* 46, 69-91.

Obstfeld, M. (1986) "Rational and Self-Fulfilling Balance-of-Payments Crises" *American Economic Review* 76, 72-81.

Obstfeld, M. (1996) "Models of Currency Crises with Self-Fulfilling Features". *European Economic Review* 40, 1037-1047.

Macdonald, Ronald and Ian W. Marsh (1996) "Currency Forecasters are Heterogenous: Confirmation and Consequences" *Journal of International Money and Finance* 15(5), 665-685

Martinez, Juan and Javier Santiso (2003). "Financial Markets and Politics: The Confidence Game in Latin American Emerging Countries." *International Political Science Review* 24: 363-395.

Masson, P.R. (1999) *Multiple Equilibria, Contagion, and the Emerging Market Crises.* IMF WP/99/164.

Rodrik, D. and A. Velasco (1999) "Short-term Capital Flows". NBER Working Paper n. 7364.

Romer, Christina D. and David H. Romer (1989) "Does Monetary Policy Matter? A New Test in the Spirit of Friedman and Schwartz" *NBER Macroeconomics Annual* 4, 121-184.

Rothenberg, Alexander D. and Francis E. Warnock (2001) "Sudden Flight and True Sudden Stops" *Review of International Economics* 19, 509–524.

Rubinstein, Mark (1974) "An Aggregation Theorem for Securities Markets" *Journal of Financial Economics* 1, 225-344.

Sachs, Jeffrey, Aaron Tornell, and Andrés Velasco (1996) "The Mexican Peso Crisis: Sudden Death or Death Foretold?" *Journal of International Economics* 41, 265-283.

Salomon Smith Barney (2002) *Brazil, Economic and Country Market Analysis.* August 20, 2002.

Samuels, David (2004) "From Socialism to Social Democracy: Party Organization and the Transformation of the Workers' Party in Brazil" *Comparative Political Studies* 37, 999-1024.

The Economist (2002) "Race Against Time: The Markets Are Nervous About October's Presidential Election" September 26, 2002.

The New York Times (2002) "Wall Street and Brazil Are Far Apart on Outlook" October 12, 2002.

Vaaler Paul (2008)."How Do MNCs Vote in Developing Country Elections?" *Academy of Management Journal* 51: 21-44

Vaaler Paul, Burkhard Schrage, and Steven Block (2005). "Counting the Investor Vote: Political Business Cycle Effects on Sovereign Bond spreads in Developing Countries". *Journal of International Business Studies* 36: 62-88.