Partisan Politics and Country Risk: Evidence from the 2002 Brazilian Presidential Election*

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Resumo: Esse artigo busca quantificar a influência das expectativas eleitorais nos mercados financeiros, contribuído com a discussão com uma nova perspectiva. Ao invés de olhar para o mercado de ações, olhamos para o comportamento do risco país do Brasil. A análise é baseada em dados das pesquisas de intenção de votos antes das eleições de 2002 e no comportamento do EMBI+. Testa-se se o aumento na probabilidade do partido de esquerda vencer as eleições levou a um aumento no risco país brasileiro ao longo do processo eleitoral de 2002. Também modela-se os impactos na volatilidade do risco país e a interação entre os riscos país de Argentina e Brasil. Os resultados mostram que aumentos nas expectativas sobre a vitória do candidato de esquerda (Lula) foi uma causa importante para o aumento do risco país brasileiro. Aumentos nessa probabilidade são estatisticamente associados com aumentos no EMBI+. Por outro lado, aumentos na probabilidade do PSDB vencer as eleições (partido conservador) estão associados a quedas no EMBI+, embora não significativamente. Os resultados também evidenciam que o anuncio do feriado bancário ilimitado na Argentina em abril de 2002 disparou não só um aumento na média do EMBI+, mas também em sua volatilidade.

Palavras-chave: Series de tempo; Política partidária; Brasil; EMBI; Risco País

Abstract: This paper aims to quantify the influence of electoral expectations in stock markets, contributing to this debate with a new perspective. Instead of looking at the stock exchange it focuses the Brazilian Sovereign Country Risk. Our analysis is based on data from the polling before the 2002 presidential elections in Brazil and the Brazilian EMBI+. More specifically we test whether the increasing probability of a left wing party to take the power had driven the increase in that country's risk before the 2002 presidential elections. We also model the impacts on the country risk's volatility and the interaction between the Argentine and the Brazilian country risks. We argue that the increasing market expectation about the probability of Lula (left wing candidate) taking over the power was one important cause for the increase of the Brazilian country risk in 2002. Increases in this probability are significantly associated with increases on the EMBI+. On the other hand, increasing probabilities of the conservative party (PSDB) to hold the power are associated with decreases in the country risk, although not significantly. We also argue that he announcement of an unlimited bank holiday in Argentina, in April/2002, triggered not only a change of level in the Brazilian EMBI+ mean, but also a sharp increase on its volatility.

Key words: Time series; Partisan politics; Brazil; EMBI; Country risk

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I Introduction

In recent years, scholars have become increasingly interested in the inter-relationships between political events and economic indicators. Especially, more attention has been given to the relationship between expectations about government partisanship prior to elections and the behavior of stock markets (Füss; Bechtel, 2008; Herron *et al.*, 1999; Roberts, 1990). However, these scholarly efforts have mainly focused on developed economies, especially the U.S.(Leblang; Mukherjee, 2005). The majority of these studies extends and evaluates the rational partisan model as developed by Alesina (1987), Alesina et al. (1997) and Hibbs (1977). Parties are assumed to offer distinct policies which are consequential for the real economy. In the pre-election time rational, forward-looking investors should form expectations about future government partisanship and anticipate the effect of different parties holding office after elections have been held.

This paper studies the influence of electoral expectations on the mean and the volatility of the Brazilian sovereign country risk in the 2002 Brazilian presidential election. Country risks are formed by forward looking actors, and will therefore reflect the risk perception regarding sovereign bonds of a specific country (Canuto; Santos, 2003). This perception involves both, economic and political factors (Beers; Cavanaugh; Ogawa, 2006; Canuto; Santos, 2003; Mosley, 2003). Based on the rational partisan model (Alesina; Roubini; Cohen, 1997) we conjecture that a right wing party would implement more market friendly policies and ensure a balanced budget. Therefore, financial markets will value a country to be more creditworthy under a right wing government. We evaluate whether the increasing probability of a left wing party to win the election triggered an increase in Brazil's country risk.

Sovereign country risk provides a relatively clean measure of a country's soundness. If partisanship indeed makes a difference in terms of economic policy this will be reflected on the behavior of sovereign country risk. The findings suggest that increased expectations of Lula (left wing candidate) winning the election was an important driver of the steep increase of Brazilian country risk prior to the 2002 presidential election.

Interestingly, past research which explored the determinants of country risk almost exclusively focused on economic factors (Canuto; Santos, 2003). A key finding from this literature is that differences in market fundamentals can not completely explain differences in spread paid among emerging market bonds (Eichengreen; Mody, 1998). We argue that political and electoral expectations play an important role as well and help to account for some of the variance which past research was unable to explain.

The 2002 presidential election in Brazil is especially interesting to be studied. During the entire year of 2002, the rising country risk has being a main concern of media.

> "So why is there a crisis? With an election due in October, President Fernando Henrique Cardoso's chosen successor is running far behind two left-of-center candidates. Investors are nervous, and the result has been one of those downward spirals all too familiar from the history of currency crises. Fears that the government will default on its debt have caused the currency to plunge and interest rates to soar; since most of the debt is indexed either to the dollar or to short-term interest rates, this makes default seem even more likely." Paul Krugman (The New York Times, August 9, 2002).

The remainder of this paper is organized as follows. Section II briefly reviews the literature about both partisan politics models and the interaction of country risk and politics. Section III outlines the analytical framework and derives empirically observable implications of the theory. The following section describes the data, the main explanatory variables used, as well as the methodology employed, namely GARCH models. Section V describes each model tested and the results obtained in each of them; and section VI concludes, presents the main implications of our findings, and suggests further research on the topic.

II Literature review

Partisan Politics Models

The literature on Partisan models is a derivation from the political business cycle theories (Drazen, 2004). There are two main variables in this literature. First, models such as Nordhaus (1975) argue that incumbent parties manipulate the economy to win elections and this would lead to business cycles in terms of pre-post election dynamic. Partisan theories, on the other hand, agree that there might be political manipulation of the economy, but differs from the former arguing that business cycles derive from the fact that different parties pursue different economic policies according to their economic interests, which are in line with the interest of its supporting groups (Drazen, 2004; Hibbs, 1977). Alesina (1987) extends this argument saying that not only different preferences of parties matter, but also the expectations of voters concerning these preferences matter because agents are rational (Drazen, 2004). All these models discuss only macroeconomic implications, basically, the exploitation of the Phillips curve by parties, namely the trade-off between unemployment and inflation. Several models have found some evidence of these partisan effects on the economy (Alesina; Roubini; Cohen, 1997; Caporale; Grier, 1998) and therefore, the literature that follows them assumes their basic rational: left wing parties are associated with lower unemployment and higher inflation, and right wing parties the other way around.

Important extensions of these theories are models that try to study the effects of partisan politics into the dynamics of stock exchange. Since left wing parties are typically associated with higher inflation, it decreases investors' real returns in the short run, being then negatively seen by markets. So, stock markets are expected to perform better under right-wing than under left wing governments. These extensions have focused mainly on the American market (Gärtner; Wellershoff, 1995; Herron *et al.*, 1999; Huang, 1985), but the evidence for the United States seems inconclusive at best[1].

Politics and country risk

With the increasing financial liberalization observed in the past 30 years, country ratings and country risk[2] attracted a large attention from investors, governments, media and scholars (Canuto; Santos, 2003). Especially, in developing and volatile countries such as Brazil, this discussion became part of the daily economic media. We will make a more detailed discussion about these concepts in the analytical framework part. For now, we just have to remind that both concepts reflect investors risk perceptions that depend not only on economic, but also on political factors.

A bunch of literature has being devoted to explain the drivers of both the behavior of ratings of countries and the country risk, especially in emerging markets. However, the larger part has focused on their macroeconomic determinants. Macroeconomic ratios such as GDP per capita, net government debt/GDP, government current deficit/GDP, inflation rate, net external debt/current account receipts are well known ratios that are among the most important for the evaluation of a country's default risk (Beers; Cavanaugh; Ogawa, 2006; Canuto; Santos, 2003; Morgan, 1995). Only more recently, some authors have discussed their political determinants (Eichengreen; Mody, 1998; Mosley, 2003), although the rating agencies and investors explicitly take in consideration political factors such as "willingness to pay from governments" in their evaluations (Beers; Cavanaugh; Ogawa, 2006; Mosley, 2003). We

[1] For a commented summary of these studies see (Füss; Bechtel, 2008)

[2] Although we recognize the difference between sovereign and country risk, we will use here interchangeably since they are highly correlated.

believe this lack of literature stems from the fact that these factors are harder to be quantified since they are, by definition, more subjective than the macroeconomic ones.

Specifically for Brazil, some authors have already touched the links betweens political expectations and market risk perceptions, though with a more descriptive approach. Martinez and Santiso (2003) examine the reactions in Wall Street to main political facts during the pre-election period in 2002. They also draw some insights about the relationship between Brazilian and Argentine EMBI+'s after the Argentine crises. With a historical perspective, they compile several analyst reports produced by leading Wall Street investment firms written about Brazil in 2002 and explicitly link political and economic events with market reactions and draw comments on how market perceptions changed over time. He concludes that "part of the story behind emerging markets financial crises is of self-fulfilling prophecies, risk seeking and risk aversion, and changing perceptions (…), there are complex interactions between politics and finance, between individual and institutional interactions, and macroeconomic and financial variables. In the end, the name of the game in emerging markets is confidence, trust and mistrust." (Martínez; Santiso, 2003). Hardie (2005) also follows a historical perspective and questions the idea of the "strength of the market" in influencing internal macroeconomic policies in emerging markets that Mosley (2003) proposes. He argues that although the behavior of Brazilian bonds market might be explained by political factors, data does not support the initial idea of withdraw of money from Brazil by international investors. He suggests that the level of understanding about such events is still low and maybe the explanation relies more on internal agents than on international investors (Hardie, 2005).

Spanakos and Rennó (2006) analyse the 1994, 1998 and 2002 elections and found causality effects in both ways between the behavior of polling voting intentions for Lula and country risk. Using Granger causality tests, he concludes that increasing voting intentions for Lula caused country risk to increase, and on the reverse way, Lula's voting intentions are negatively affected by other financial market indicators such as exchange rate, Ibovespa and inflation.

Partisan models and financial markets in Brazil

Jensen and Schmith (2005) examine the relationship between electoral expectations and stock market performance in Brazil. Their results reject the anticipated partisan effect hypothesis .The estimations suggest that the downturn in the Brazilian Stock Exchange before the 2002 elections was caused by a falling world economy, and not by enhanced electoral prospects of Lula, the left wing candidate. This finding is especially interesting because it clearly contradicts both, media reports and common sense. However, and in line with common sense, the results support the view that increasing electoral prospects of Lula caused volatility to increase[3].

We deviate from the above cited more descriptive approaches until now proposed for Brazil and will base our research on the method proposed by Füss and Bechtel (2008) which is based on the tradition of Rational Partisan Politic models such as Alesina et al.(1997). As they summarize: "we pay attention to both the partisan differences in economic policies and the prospective behavior of financial investors who try to anticipate the effects of economic policies under different governments" (Füss; Bechtel, 2008). We innovate by applying their methodology to effects of electorate expectations in the Brazilian country risk instead of in

[3] There are however several critics on their methodology. For more details see (Füss; Bechtel, 2008). On top of their critic, by using a dollar denominated stock exchange index of the Brazilian Stock Exchange, he finds that most of the fluctuations in the index were due to the exchange rate fluctuations. This is one the one hand obviously expected, but on the other has low explanation power.

the stock exchange index. In terms of methodology, we also follow them by applying a GARCH model.

III Analytical framework

Brazilian political framework

Although Brazil does not have a typical bipolar party system which would be indicated to apply a pure Partisan Political model, we assume that the model can be used as an approximation to Brazil's real political dynamic. Brazil has a multi-party system in which only a few parties have significant size and political influence. Among them, two have dominated the presidential elections in the last four elections (1994, 1998, 2002 and 2006), the Partido dos Trabalhadores (PT), whose candidate in all elections was Lula, and Partido Social Democrata (PSDB), whose candidates have been Cardoso (1994, 1998), Serra (2002) and Alckmin (2006). Although we can not classify any of them as right wing, we will use the spectrum proposed by Coppedge (1997) classify them in terms of their relative position. So, in our framework, Lula / PT will be our left-wing and Serra / PSDB will be our right-wing candidate / party. Although this is a simplification, since only these two parties had real chances to win during the pre-election period, we believe that the relevant information that investors would acquire from the polling stems mainly from the dynamics of these two candidates voting intention[4].

We chose to study only one election because given that Brazil still has a young democracy, its political spectrum is not well defined, and especially is not constant over time. More specifically, Lula was seen very differently by investors in each of the four elections, ranging from almost communist in 1994 to pro-market oriented in 2006. Therefore, it would be difficult to find evidence that the market would dislike him in all four elections. On top of that, during all these 12 years, the Brazilian stock exchange experienced several important crises, namely Mexico 1994, Asia 1997, Russia 1998 and Brazilian 1999. And, even worse, some of them occurred parallel to election periods. Therefore, it would be difficult to model them all together.

Risk perception and country risk

Our starting point is to accept the standard modern trading behavior theories, in which agents are assumed to be rational and to act according to their expectations about the future. The second step is to remember the basic investment theory that recognizes the trade-off between risk and return. In other words, the fact that investors require higher expected returns when their risk perception is higher.

In our context, we will treat risk perception as country risk, concept which is one of the possible methodologies to asses the risk perception of the market towards a specific country. Next, in order to more specifically define the country risk, first, we need to make a distinction between country sovereign ratings and country risk. Sovereign ratings are evaluations from rating agencies such as Standard & Poor's, Fitch, Moody's of the capacity and willingness of central governments to pay, integrally and according to the existing contracts, their debts (Beers; Cavanaugh; Ogawa, 2006; Canuto; Santos, 2003). In these evaluations, both macroeconomic and political aspects are taken in to estimate the risk of default of central governments. The results of these evaluations consist of grades assigned to countries, like AAA, B and so on (Beers; Cavanaugh; Ogawa, 2006). These grades are important market signs - especially for international investors - and contribute to the

[4] During isolated periods other candidates like Ciro Gomes or Roseana Sarney experienced substantial voting intentions, what could influence investors' perception. This can be a topic for further research.

improvement of information asymmetry that exists in the international bonds market (Canuto; Santos, 2003).

Differently from ratings, country risk indexes are ex-post indexes derived from actual risk premium paid by sovereign bonds in secondary markets. The most disseminated index for emerging countries is the EMBI+ calculated by the J.P.Morgan. The sovereign margin is the difference between the interests paid by bonds from a specific country and the bonds from the American Federal Reserve – and this margin is usually referred as country risk (Canuto; Santos, 2003). The spread paid in comparison to the American bonds reflects the risk premium required by investors to buy riskier emerging countries bonds instead of risk free assets. The larger this margin, and therefore the country risk, the larger is the risk perception about this country. Although different, ratings and country risk are closely related and present pro-cyclical patterns between them. This cycle can be described as: investors acquire information from rating agencies before buying bonds, while rating agencies look at market conditions, and spreads paid by agents to make their assessment and assign ratings to countries (Canuto; Santos, 2003).

Hence, putting the risk-return trade-off and the country risk definition together, we state that: increasing risk perception about a country should lead to higher country risk and this would be bad for a country because it means an increase in the cost of international funding for this country.

In our investigation, we will deal with the Brazilian EMBI+ to assess the market risk perception about Brazil, and we will especially look at the political factors that influence it. More specifically, our framework assumes that agents consider two transmission mechanisms from politics to risk perception, and embodies them in their expectations. On one hand, and here is the focus of our attention, different parties when holding the power would have direct influences on the willingness of a country to pay back its external debt. It means that, due to his political ideology, the president of a country can unilaterally declare a moratorium or change the rules of re-payment of its debts. Translating in more objective terms, agents try to assess the probability that the politician in power will pay back its external debt according to the accorded contracts. This is what we could call pure political risk – and if one candidate is associated with a lower willingness to pay the country's external debt, this might increase the risk perception about this country. A second transmission mechanism is an indirect risk associated with politics. Here we say that depending on the preferences of the party that win elections, different economic policies will be implemented, and this might affect the economic capacity of a country to pay back its external debt. So, if market expects a certain politician to implement economic policies that harm the soundness of the country's economy, this politician might be associated with higher risk perception. In our case, since we are studying a pre-election period, the above cited expectation will be mainly the expectation about election outcomes, or the chance that a specific politician will win elections.

Putting all pieces together, in our model: expectations about election outcomes (left x right wing parties) influence risk perceptions about moratorium due to either bad economic policies and / or political non-payment of national debt, which at the end influences the country risk (EMBI+).

Besides the influence of partisanship in Brazil, we also hypothesize about the influence of the Argentine country risk in the Brazilian EMBI+. The link here is motivated by empirical evidence and we try to build a theoretical link by mean of the possible existence of a contagion effect. We hypothesize that after Argentina declared a bank holiday in April 2002 investors start seeing Brazil and Argentina as holding the same type of risk associated with left-wing politicians. But in reality, both countries had very different economic fundamentals. As Martinez and Santiso (2003) argue, Brazil was largely unaffected by the Argentine crises'

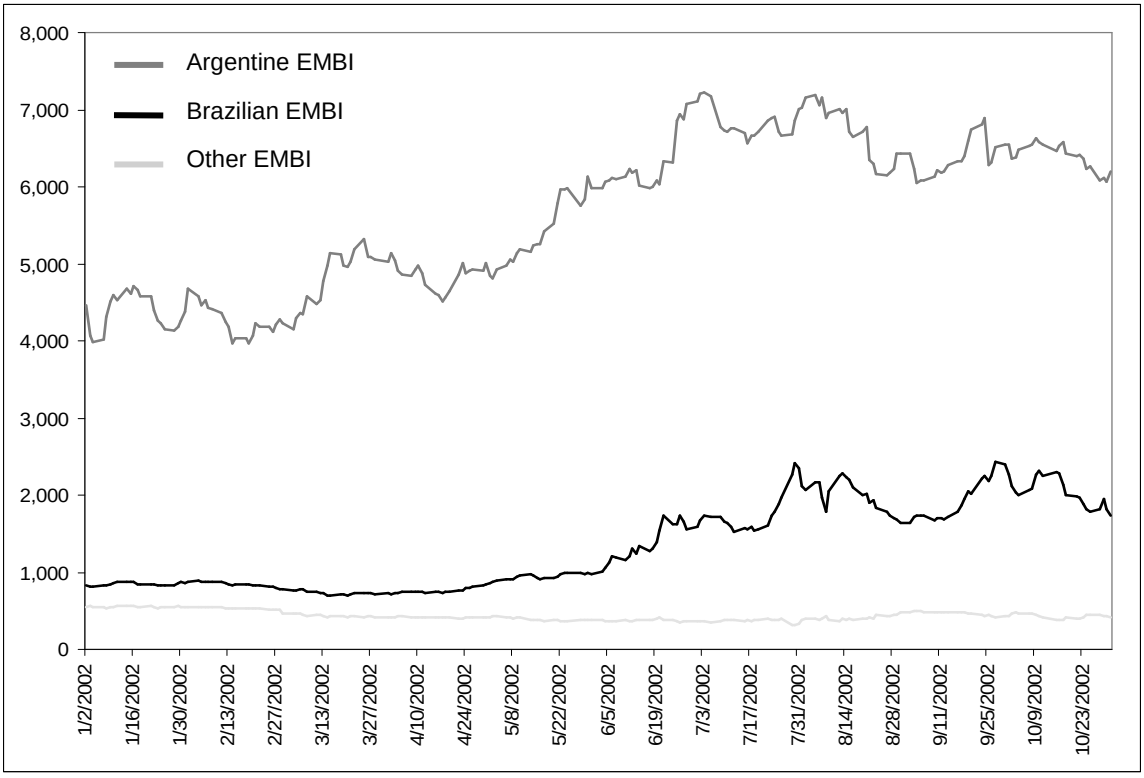
worse phase by the end of 2001. Therefore, theoretically, we would not expect this to change unless something different (elections) would happen in Brazil.

Stylized facts

Some descriptive data illustrate the motivation to most of our hypothesis which will be stated afterwards. Graph 2 shows the joint behavior of the Brazilian and other countries' EMBI+[5] and suggests that while the Brazilian EMBI+ have behaved for a long time similarly to other countries' EMBI+, it departures from this path during the pre-election period from February to October/2002, returning slowly to the former path after it.

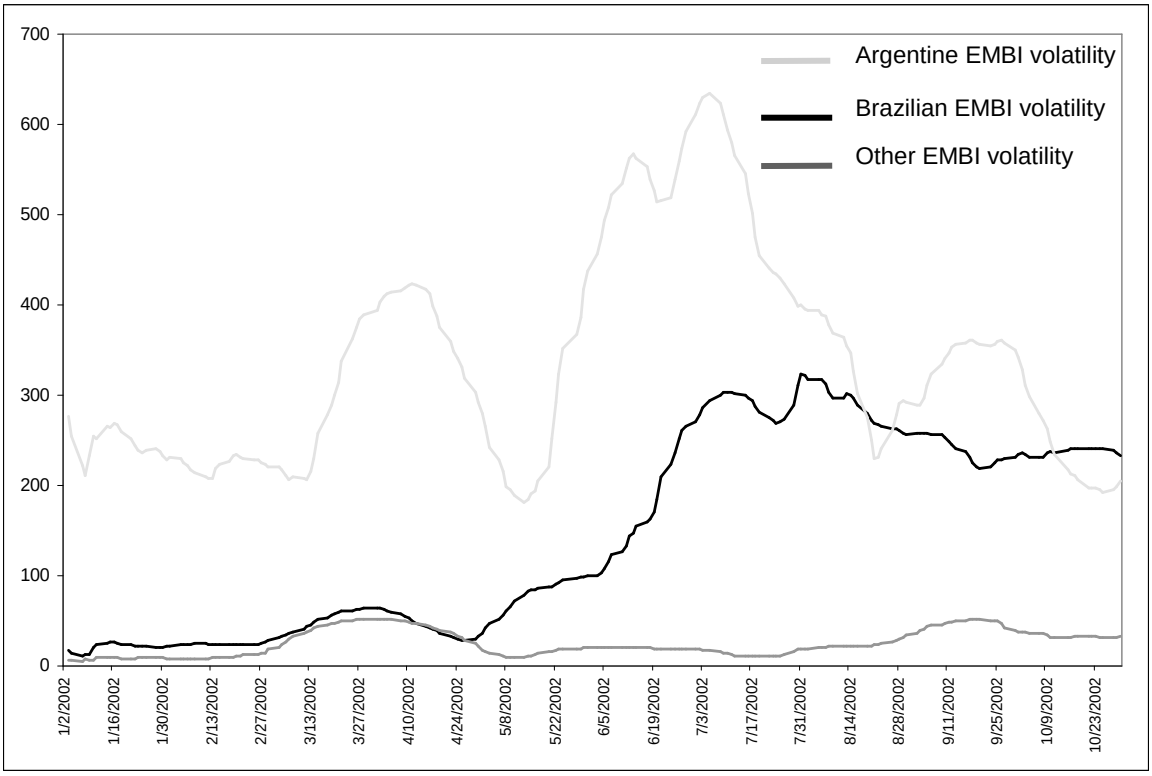
Graph 4 shows how the Brazilian EMBI+ stops following the path of other countries' EMBI+ and starts behaving similarly to the Argentine EMBI+ after the Argentine bank holiday in April 2002. The correlation coefficients between the Brazilian, Argentine and other countries' EMBI+ also provide us some insights. From 02/01/02 to 18/04/02 (before Argentine bank holiday) the Brazilian EMBI+ was highly correlated with other countries' EMBI+ (0.95) and negatively correlated with the Argentine EMBI+ (-0.62). After this event to the elections day, the situation is inverted: Brazilian EMBI+ correlates with the Argentine (0.81) and not anymore with other countries' (0.18). Graph 5 explicitly looks at a rolling volatility of the Brazilian EMBI+ and shows that it faces a complete change in its path after the same event: From other countries' level to Argentine level.

Figure 4: Brazilian, Argentine and other countries' EMBI+ (Jan – Oct/2002)



[5] Mexico, Peru, Colombia, Venezuela, Equador, Panama, Russia, Turkey, Poland, Bulgaria, Filipines, Marrocos, Nigeria, Indonesia, Egipt, Malasia, South Africa and Ucraine.

Figure 5: Brazilian, Argentine and other countries' rolling volatility[6] (Jan – Oct/2002)



Hypothesis

Given this basic rational and the descriptive data above presented, we now state our specific hypothesis to be tested:

Hypothesis 1: Increase in Lula's (PSDB´s) winning probability would increase (decrease) Brazilian EMBI mean returns. Rational: International investors would get afraid that Lula's economic policies could ruin the Brazilian economy, as well as that he would propose a unilateral moratorium due to his political preferences.

Hypothesis 2: Increase in Lula's (PSDB´s) winning probability would increase (decrease) Brazilian EMBI volatility. Rational: Increasing risk perception would also be reflected on volatility since uncertainty would be higher and market would be more nervous.

Hypothesis 3: After the Argentine bank holiday, volatility in Brazilian EMBI would increase. Rational: Instead of causality effect, the rational here is a contagion effect after Argentine bank holiday, investors pay more attention on political factors on the region and on default risk. It creates a general phobia against left-wing parties in the region and wakes attention for risks until there ignored (e.g. high debt/GDP ratio in Brazil).

Hypothesis 4: After the Argentine bank holiday, the Brazilian EMBI+ would increase and both indices would start fluctuating together. Rational: Changes in perception mixes perceptions about both countries.

IV Data and methodology

Our main dependent variable is the daily Brazilian EMBI+ calculated by the J.P.Morgan. As discussed in the analytical framework, this index reflects the perception of risk about Brazil from international investors and is the most used index in the market. We

[6] 42 days rolling standard deviation.

chose to work with a country risk index instead of a sovereign rating due to the higher frequency of that. While ratings are given in levels and remain stable for longer periods, country risk indexes fluctuate permanently and reflect immediately each new information acquired by the market. Therefore, it is more suitable to our purpose because we want to measure the effects of information steaming from each new polling result, which happens usually on a weekly base.

Since EMBI+ index reflects instantaneously the price paid for Brazilian bonds in the international secondary markets, if investors are sensitive to electoral expectations, it should be reflected in this index.

The winning probability of a candidate is our main explanatory variable. Differently from Jensen and Schmith (2005), who used raw polling results, in order to calculate the winning probability we use the "election option model" proposed by Alesina et al. (1997)and implemented also by Füss and Bechtel (2008) and Leblang and Mukherjee (2005) in other contexts. This methodology has two main advantages: first, it accounts for the time factor. It is intuitive to think that if one candidate has 60% of intentions on a poll a few days before the elections, it should be interpreted as an almost sure win, whereas the same result in a poll six months before the elections still leaves room for uncertainty. Second, if the polling results are very volatile, each of them does not contain as much information as if they would be rather stable (Füss; Bechtel, 2008)[7].

Therefore, using Füss and Bechtel's (2008) framework, the probability of Lula winning the upcoming elections is calculated by:

$$\Pr_t^R = \Phi\left[\frac{Q_t^R + \mu m - 50}{\sigma\sqrt{m}}\right]$$

where Φ indicates a cumulative standard normal distribution, Q_t^R is the proportion of voters who intended to vote for the right-wing candidate (Serra / PSDB) at time *t* relativetly to those who intended to vote for the left-wing candidate (Lula / PT), and *m* is the number of days left until the election. μ is the sample mean of changes in this proportion, and σ is the sample standard deviation in daily changes. This can be interpreted as a first proxy for investors' expectations about the probability of Serra (PSDB) to win the upcoming elections at each day (*t*) in the pre-election period. The probability of Lula winning is calculated by $\Pr_t^L = 1 - \Pr_t^R$, with $\Pr_t^j \in [0,1]$.

For the polling results, we used a pooling of public opinion data from different polling institutes[8]. As we can see in the formula, although polling results are published on average every four days, since we take in consideration the days remaining to the election, we calculate a new probability for each candidate at each day. Also following Füss and Bechtel (2008), in days in which we did not have any new polling, we repeated the last one based on the argument that investors would not have any new information to take into account that not the new number of days to the election.

Differently from Jensen and Schmith (2005) (who looked at Ibovespa, not EMBI+), we did not take polling results from the run-off and we started considering polling results some days after both authors. There are some reasons for it: for the run-off, we think that it

[7] For further explanation about the methodology please refer to Füss and Bechtel (2008) or Alesina et al.(1997).

[8] It is reasonable to assume that the methodology and agreement across the different survey data series is sufficient to allow pooling them into one series. In cases when more than one polling was published in the same date, we simply averaged the series. In most cases, the discrepancy did not exceed 3%.

represents a "structural break" in the series and that the logic of the election differs from the first round. For the later staring, we started considering only results from polling when Serra was officially appointed as PSDB's candidate in March/2002. Before that, since other pre-candidates from PSDB were included in the polling, it is hard to compare results among different institutes and even on a time-consistent way.

One aspect that the methodologies implemented until now does not take into consideration is the proportion of waverers during the polling period. In our opinion, besides the time factor, this is a key factor to be considered. It is also intuitive to think that a polling result published in a context of a large proportion of waverers should have less weight than one in a context of few waverers. To account for this, we created a variable which is the inverse of the proportion of waverers and we multiplied it by the probability of a party to win. By multiplying these two variables we get our main explanatory variable. More explicitly, it can be calculated by:

$$\Pr_t^R\_wav = \Pr_t^R * (1 - prob\_wav)$$

where prob_wav is the percentage of waverers in period *t.*

We expect this variable to behave like this: increasing with the proportion of the voting intentions of a candidate, increasing (decreasing) with the approximation to the election day for the leading (loosing) party; increasing for a candidate as the proportion of waverers decrease. In our opinion, this would better describe the investors' expectation than the pure election probability as calculated by former authors. One of the important characteristics of our new variable is that, since the percentage of waverers decline with time[9], our new variable's range becomes larger than the pure probability as calculated before. Namely, while the former probability of Lula winning ranges from 84% to 100%, our new variable ranges from 46% to 74% from March to October, what in our opinion better reflects the large uncertainty observed at the beginning of polling in March/2002.

As proposed by Hibbs (1977) we will assume that they have different ideologies and that, when in power, would implement different economic policies, which will be in line with preferences of their supporting base, what will influence investors' expectations. Namely, Lula (Serra) is associated with higher (lower) inflation and lower (higher) unemployment, but more importantly, with higher (lower) risk.

Our second most important explanatory variable is the Argentine EMBI+. Like the Brazilian EMBI+, this variable is used as a proxy of investors' risk perception about Argentina during the period. Although we have the series from March/2002 on, in our hypothesis we argue that the risk perception about Argentine and Brazil starts to correlate only after the bank holiday was established in late April in Argentina. Therefore, we created a dummy variable which assumes the value of one after this event, and zero before. These variables are used in two different ways. On one hand, we use the dummy to test whether we find statistically different volatility levels between the two periods mentioned. Additionally, we use the multiplication of the dummy variable by the Argentine EMBI+ as explanatory variable for the behavior of the mean of the Brazilian EMBI+ after April/2002.

We tested all our independent and our dependent variables for stationarity using ADF test. The results suggest that they are non-stationary in levels, but stationary in first differences.[10] Therefore, we used the log differences of the Brazilian EMBI+ as our dependent variable, simple first differences of each candidate's winning probability and the log difference of the Argentine EMBI+ as our key variables.

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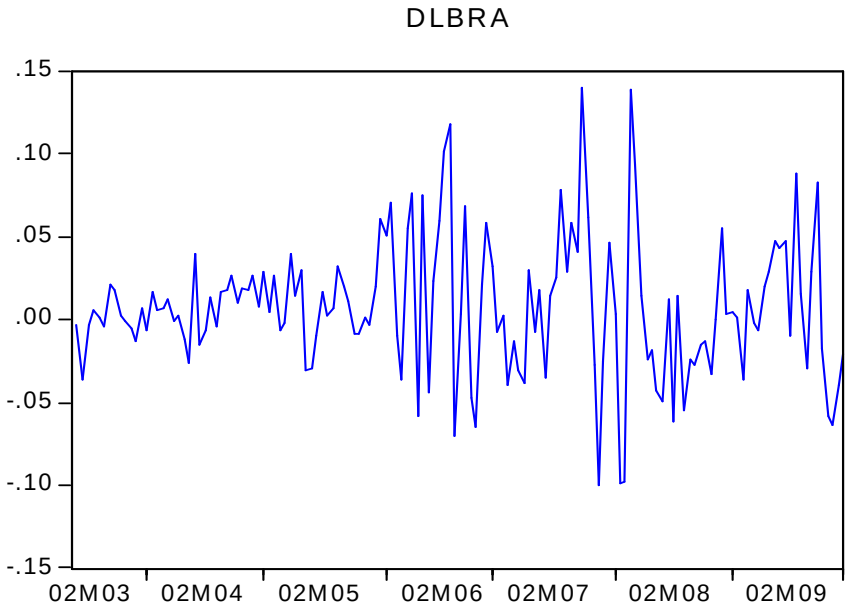
[9] 45% in March to 25% in October/2002.

[10] We used log differences for the Brazilian and Argentine EMBI+.

Our dependent variable showed to be not normally distributed, to be skewed (m3=0,38) and to present leptokurtosis. This is revealed by the Jaque-Bera normality test, that rejects the null hypothesis of normality at 1% level, and by the presence of kurtosis of 4,10, which is larger than 3. These facts raised the suspicion of the presence of volatility clustering, that is confirmed by the Langrange multiplier test, which is able to reject the null hypothesis of no volatility clustering (no ARCH effects) at a 1% significance level. To confirm this result, we apply the Ljung-Box test on the squared returns for 5 and 25 lags, and it shows autocorrelation on squared returns at 1% significance level, as expected. Therefore, we conclude that our dependent variable is suited to the use of a GARCH model which is the methodology we chose to apply. As can be seen from figure 6, there is volatility clustering in the daily return series.

Figure 6: Brazilian EMBI+ daily logged returns (March – October/2002). N=145



The presence of volatility clustering, or autoregressive conditional heteroscedasticity, means that our data presents periods with different volatility levels. In other words, there are more tranquil periods, which are interspersed with more volatile periods (Alexander, 2001). Hence, the volatility of one period is autocorrelated with the volatility of the previous periods. ARCH or GARCH models are suitable for this kind of data, especially because besides modelling the mean of the series as a normal AR model, it specifies an equation to model the conditional variance of the series, which is a function of past squared unexpected returns (ARCH effects) and of its own past volatility (GARCH effects) (Alexander, 2001). Our dependent variable (Brazilian EMBI+ daily returns) and following our mean equation is given by:

$$r_t = \mu_t + \xi L_t + a_t \text{, where } a_t = \sqrt{h_t}\varepsilon_t \qquad (1)$$

where μ_t represents the conditional mean of r_t at t-1; ε_t is an independent and identically-distributed random variable with mean 0 and variance 1; L_t is a vector of exogenous regressors; a_t is the innovation at time t; h_t is the conditional variance.

Then, we use the residuals $\hat{a}_t$ of the mean equation and specify the variance equation to model the conditional variance as a GARCH (1,1):

$$h_t = \alpha_0 + \alpha_1 a_{t-1}^2 + \beta_1 h_{t-1} + \lambda_i X_{i,t} \quad (2)$$

Where α_0 is a constant, a_{t-1}^2 represent prior shocks (ARCH term), h_{t-1} represents the past variance (GARCH term), and $X_{i,t}$ a set of exogenous volatility regressors. Afterwards, we test both equations applying the GARCH methodology using the Eviews software.

V – Empirical results

We estimated six different specifications of a GARCH (1,1) model with different degrees of parsimony. Beginning with the mean equation, table 1 shows that, as argued before, the simple probability of Lula to win is not appropriate as a dependent variable for our model. Although it presents the expected positive sign, it is not significant. On the other hand, equations II, IV, V and VI confirm our hypothesis that the probability of Lula to win, multiplied by the (1 – the percentage of waverers) have a positive influence on the behavior of the Brazilian country risk, with a significance level of at least 10%. Or, in other words, increases in this variable, which is a proxy for the risk perception of the market, causes the Brazilian country risk to increase. In model III we see that the same variable, but for Serra, has the expected contrary negative coefficient, but is not significant, and therefore we will not draw any inference about it.

In all equations but IV we used the Argentine EMBI+ multiplied by the dummy for the bank holiday as explanatory variable. In all of them, the coefficients have the expected positive sign and are significant at 5% level. This is in line with our predictions that after this event both country risks started moving very closely.

Concerning the variance equation, both ARCH and GARCH coefficients are positive and significant at 1% level. The ARCH effects measure the sensibility of the variance to past innovations whereas the GARCH effects indicates the persistency of volatility. In typical financial market series, ARCH effects lie between 0.1 and 0.2 while GARCH is around 0.8 (Alexander, 2001). In our different specifications, ARCH effects lie between 0.28 and 0.31 and the GARCH between 0.60 and 0.72. This indicates that volatility in our series react quite strongly to past innovations, but die out very quickly on the other hand, what characterizes this market as spiky (Alexander, 2001) – which is typical from less developed or emerging markets. In all cases the sum of ARCH ad GARCH effects is smaller than one, respecting the requirements of the methodology.

Also in the variance equation, we included the dummy for the Argentine bank holiday in all models but V. In all cases its coefficients are positive and significant at 10% level, confirming our hypothesis that volatility of the Brazilian EMBI+ is higher in the period after this event. In model VI we included the variable probability of Lula to win multiplied by (1 – percentage of waverers) in the variance equation and we get a coefficient with sign different from expected, but not significant, so we prefer not to make inferences about this result.

In equation V we included a lagged term of our main explanatory variable. Its coefficient has the expected positive sign and is significant at a 1% confidence level. The interpretation of this result is that the trend of the probability of Lula winning is also important, and not only the specific movements of this variable. Hence, markets react not only to the last information available, but to a general trend that the probability of one candidate to win is high or low in the last observations – what could be described as a “market feeling” and would characterize the market to work in a imperfect way, with information asymmetry.

We compared all specifications using the Akaike criteria and concluded that equation V has the better fit – lower Akaike criteria. So it lead us to conclude that the above mentioned explanation about this “market feeling”, and the imperfect functioning of markets may be a good description of the reality. Models I, II, III and IV have very similar Akaike criteria,

while specification VI has the worse one. However, this conclusion should be seen cautiously given that the use of the Schwarz criteria provides us different conclusions.

For all specifications we apply the ARCH-LM (1) test in the residuals and we can not reject the null hypothesis of no ARCH effects left. The results of the Ljung-Box test in lag 5 of the squared residuals also confirm that there is no autocorrelation left in the squared residuals. Therefore, we have successfully modeled out all volatility clustering. The Ljung-box test in lag 5 shows that the residuals are also not autocorrelated. For all specifications, the Jaque-Bera test in the residuals is not able to reject the null hypothesis of normality. Therefore, differently from our original series, the residuals are now normally distributed.

Table 1: Models for logged changes in the Brazilian EMBI+ (N=145)

Models	I	II	III	IV	V	VI
Mean Equation						
D Pr_Lula (L)	0.225					
	(0.196)					
D Pr_Lula (L) * (1-waverers)		0.612*		0.593*	0.619*	0.504**
		(0.357)		(0.351)	(0.133)	(0.330)
D Pr_ PSDB (R) * (1-waverers)			-0.362			
			(0.364)			
Dl arg * dummy argentina	0.302**	0.309**	0.302**		0.326**	0.327**
	(0.128)	(0.127)	(0.129)		(0.133)	(0.130)
D Pr_Lula (L) * (1-waverers) (-1)					0.846***	
					(0.249)	
Variance Equation						
ARCH	0.281***	0.283***	0.280***	0.286***	0.310***	0.303***
	(0.107)	(0.106)	(0.107)	(0.104)	(0.122)	(0.094)
GARCH	0.640***	0.642***	0.642***	0.645***	0.604***	0.716***
	(0.111)	(0.114)	(0.110)	(0.106)	(0.140)	(0.073)
Dummy Argentina	0.000*	0.000*	0.000*	0.000*	0.000*	
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	
D Pr_Lula (L) * (1-waverers)						-0.002
						(0.009)
Constant	0.000	0.000	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Statistics						
AIC	-3.8667	-3.8755	-3.8655	-3.8630	-3.8948	-3.8394
SIC	-3.7435	-3.7523	-3.7423	-3.7603	-3.7505	-3.7162
LogL	286.337	286.975	286.248	285.066	287.429	287.428
JB Test (prob)	0.732	0.747	0.729	0.844	0.670	0.255
ARCH LM (1) test (prob)	0.830	0.934	0.821	0.921	0.864	0.850
Q(5) (prob)	0,235	0,875	0,23	0,188	0.152	0.105
Q^2(5) (prob)	0,277	0.150	0,288	0,324	0.231	0.196

Note: Standard errors are reported in parentheses. ***, ** and * denote significance at 10%, 5%, and 1% level respectively.

Differently from some previous works (Füss; Bechtel, 2008; Jensen; Schmith, 2005), in this paper we did not use any macroeconomic control variable such as inflation or exchange rate. There are specific reasons to exclude each of them. Common to all of them, we thought that the interaction between all these macroeconomic variables is very difficult to be understood and beyond the scope of this work. We recognize, however, the need of an extension of our work to deal with this further complexity. Regarding the specific reasons: we excluded exchange rate because, as argued in the literature review, we also recognize that the country risk dynamics is highly correlated with the exchange rate behavior, since both are associated with the withdraw of money from the country. However, we do not see a clear causality between both, but rather a common cause for both. Concerning inflation, it has been rather stable during the period analyzed, so we do not expect to find any influence of it on the country risk. One macroeconomic variable that might be interesting to be included is the

debt/GDP ratio, especially because of its interrelationship with exchange rate and internal interest rates, but we also left it for further research due to time and scope constraint.

We also tested the possible influence of entropy on the volatility as Füss and Bechtel (2008) and Jensen and Schmith (2005) do, but we found no significance of it[11].

We also specified a TARCH, instead of a GARCH model. This would have the advantage of accounting for a structural break in the data. We did not present its results here since it presents a worse fit (worse Akaike criteria).

After testing all the described different specifications, our findings support our hypothesis 1, 3 and 4 and remain inconclusive about hypothesis 2. In words, it means that the Brazilian EMBI+ showed to be sensitive to partisan politics, or more specifically, to the behaviour of election expectations in the Brazilian 2002 elections. This sensitivity was reflected on its mean, but we could not see it on its volatility, so we leave that as subject for further research. Moreover, we showed that after the announcement of a banking holiday in Argentina, the Brazilian EMBI+'s mean and volatility started behaving similarly to that country's EMBI+.

Our results are in line with the general view that claimed that the increasing probability of Lula to win the 2002 elections in Brazil caused the country risk to sky rock. It also tests and confirms the definitions of country ratings that explicitly argue that political factors are subjectively taken in consideration in country ratings[12] (Beers; Cavanaugh; Ogawa, 2006; Canuto; Santos, 2003; Mosley, 2003). More than that, our study is important because it quantifies this influence, which is generally treated as subjective. The results are also in line with several studies about the influence of politics in investors' expectations (Canuto; Santos, 2003; Martínez; Santiso, 2003; Mosley, 2003)[13].

However, our results are in contradiction with the until now existing studies that try to model the partisan influences in the Brazilian stock exchange using GARCH models (Jensen; Schmith, 2005). As argued in the literature review, this is mainly due to three factors: the fact the Brazilian index has several other strong influences; specification errors in the case of Jensen and Schmith (2005), and a problem in the extension of the timeframe.

VI Conclusions

Our paper is a contribution to the recently expanding body of literature that aims to better understand the links between partisan politics and financial markets. We are based on past research, to the extent that we assume agents to be rational and forward looking and in the way we model electoral expectations. However, we bring innovations both in terms of methodology and theme. In terms of methodology, we innovate by adding the consideration of the percentage of waverers in the electoral expectations. In terms of theme, we innovate by modeling the partisan politics influence on country risk, and also by looking at some events of the Argentine crises to help explaining the 2002 increase in the Brazilian country risk.

In our model, we use the winning probabilities of the two main presidential candidates from March to October/2002 measured by public polling, together with the declaration of banking holidays in Argentina in April/2002 and the posterior behavior of the Argentine

[11] These results are not shown in our tables. For further explanation about this concept, please refer to Füss and Bechtel (2008).

[12] Here we assume that country risk and ratings are closely correlated as Canuto and Santos (2003) argues.

[13] In the middle of his campaign in 2002, on June 22th, in the context of sky rocking EMBI+, Lula released a document called "Letter to the Brazilian folk", which received the nickname of "Letter to the bankers", in which he states his commitment to macroeconomic stability. We tried to capture whether this had any impact on EMBI+ by using a dummy variable, but we didn't find any significant result and therefore we don't report it here.

EMBI+ to explain the sky rock of the Brazilian EMBI+ during the pre-election period in 2002, from 700 base points in March/2002 to more than 2000 base points in October of the same year.

We found significant evidence to support that an increase in Lula's perceived winning probability caused the Brazilian EMBI+ to increase, whereas we did not find significant coefficients supporting the opposite hypothesis for Serra, although it had the expected negative sign. One of our specifications also supported the idea that not only the new polling results are important drivers of the country risk but also the trend of the electoral expectations in general. Our results also supported the idea that after April/2002 both the mean and the volatility of the Brazilian EMBI+ increased and that it started behaving very closely to the Argentine EMBI+.

As main conclusions, we see that partisan politics indeed affected the Brazilian country risk in the context of the Brazilian incoming elections in 2002, and that there is a contagious phenomenon from the declaration of a banking holiday in Argentina to the risk perception that international investors had about Brazil at that time.

As shortcomings of this study, we would like to refer to two main challenges that we find interesting to leave as proposes of further research. The causality effect between the Argentine and the Brazilian EMBI+ is still not clear. Although our regressions point at causality in the Argentina-Brazil direction, we cannot find sound theoretical links for that, especially because Brazil was largely unaffected by earlier and worse stages of the Argentine crises that began in 2001 (Martínez; Santiso, 2003). Therefore, we interpreted this result as a contagion in investors' perceptions – investors started seeing Brazil and Argentina as having similar situations – instead of interpreting it as causality from the Argentine to the Brazilian EMBI+. Our hypothesis is that after this event, international investors put Brazil and Argentina "in the same basket" and overreacted against the possibility that another left-wing party would come to power in Latin America. To go over this problem, one might use instrumental variables to try to find causality links, which is beyond the scope of this paper.

A second subject for future research is to include other macroeconomic variables as explanatory variables in the model. Especially the debt/GDP ratio, which is also affected by exchange rate fluctuation because part of the debt is denominated in USD.

In today's context of high financial integration and the rising of a new left-wing project in Latin America, we view our paper as very relevant both in the perspective of international investors and in a local perspective. For the first group, it can base further modeling tools that would help to predict indexes' behavior in a pre-election context. For the second group, it contributes to the existing and growing literature about the influence that international investors have on internal politics, level of independence of local politics and optimal level of financial openness among others.

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