



# State-controlled companies and political risk: Evidence from the 2014 Brazilian election<sup>☆</sup>

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## ABSTRACT

The 2014 Brazilian election offers an opportunity to estimate the vulnerability of state-controlled companies to political risk. This paper proposes a method for studying the effect of an election on asset prices using only data on stock options. We apply this method to the 2014 Brazilian Presidential election. Results suggest that Petrobras, the Brazilian oil company, would be worth around 60%–65% more if the incumbent, Ms. Rousseff, had not been reelected. We also find that reelection had a negative impact on the stock market index, but state-controlled companies were more strongly affected.

## 1. Introduction

How vulnerable to political risk are state-controlled companies in emerging economies? Petrobras, the Brazilian oil company, is a particularly interesting case. It is controlled by the Brazilian government, but most of its non-voting shares and a sizable part of voting shares are publicly traded. Once the largest company in Latin America, it has seen its value decline by > 90% (in Dollars) between the end of 2010 and the end of 2015. Part of this decline might be due to political factors. During her first term as president (between 2011 and 2014), Ms. Dilma Rousseff took several measures that were not aligned with the objective of maximizing Petrobras' profits.

The 2014 Brazilian election offers us an opportunity to assess the impact of a change in government via elections on the value of Petrobras for its shareholders. The main contenders in the election were Ms. Rousseff and Mr. Neves, an opposition candidate identified with a pro-market platform. In a hotly contested race, Ms. Rousseff was reelected by a narrow margin. If national politics is an important source of risk for Petrobras, an opposition victory should be associated with a

large increase in the price of its shares.

A recent literature studies the effect of elections on asset prices using data on probabilities of each outcome from prediction markets.<sup>1</sup> However, in Brazil, as in many other countries, there is no such data.<sup>2</sup>

This paper proposes a method to study the effect of an election on asset prices using data on stock options. We extend a standard asset pricing model, the Heston (1993) diffusion model, by including (i) the gap in valuation of the asset conditional on the election winner; and (ii) a time series of daily outcome probabilities that reflect changing market expectations for the election.

Estimating the model with option data yields estimates for the gap in valuation; the probability of each election outcome at each date; and disturbances unrelated to the election. Intuitively, these variables affect the probability distribution of the underlying asset in different ways. Options with different strike prices carry information about different moments of the probability distribution of the asset, hence they allow us to identify the parameters of the model.

We estimate the value of Petrobras shares conditional on different election outcomes of the 2014 Brazilian presidential election. Using

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<sup>1</sup> For example, Herron et al. (1999) and Knight (2006) use data from the Iowa Electronic Markets on the probability of each outcome in US presidential elections, Snowberg et al. (2007) use the market-based probability of a Bush reelection in 2004 from Tradesports, Wolfers and Zitzewitz (2009) use the so-called Saddam securities from Tradesports and Imai and Shelton (2011) use data from a political prediction market in Taiwan.

<sup>2</sup> Ferraz (2015) built and studied a prediction market for Brazilian elections. However, market participants used play money and there were clear arbitrage opportunities – for instance, selling all contracts the day before the election, implying a certain liability of \$100, would yield \$111.7.

data on Petrobras options traded in the Sao Paulo exchange, we find that Petrobras preference shares would have cost 65%–70% more (in Reais) had the opposition candidate been elected. In order to assess the effect of the election on the value of the company, we also need to estimate the effect of the election on the price of ordinary shares of Petrobras. These were less responsive to movements in the odds of reelection. A back of the envelope calculation suggests that Petrobras would be worth 61%–65% more if Ms. Rousseff had lost the election. This effect is huge both in relative and absolute terms, as it translates into a difference in company valuation around USD 45 billion.

The results for the probabilities of each election outcome are in general agreement with the movements in presidential polls. Reassuringly, from the election day on, the estimates attribute probability very close to 1 to a win by the elected president.

We then repeat the exercise using Petrobras options traded in the New York Stock Exchange. We find that ordinary Petrobras shares would have cost around 80% more (in Dollars) in the case of an opposition victory. This is roughly what one would expect considering the different underlying assets (preference and ordinary shares) and different currency denominations (Reais and Dollars). Estimates for the probability of reelection are also similar to those obtained using data on options traded in Sao Paulo.

Using options on the Brazilian stock market index (Ibovespa), we estimate that an opposition victory in the election would have raised the stock market index by 18%. We also use our estimated probabilities of reelection to assess the effect of political risk on a variety of asset prices. We find that the election of Ms. Rousseff had a strong negative effect on the value of many companies. However, the effects on Petrobras, Banco do Brasil (a state-controlled bank) and Eletrobras (a state-controlled electricity company) were particularly strong. Taken as a whole, the results provide supporting evidence that state-controlled companies are particularly vulnerable to political risk and highlight how large this risk can be.

The remainder of this introduction discusses the relation between this paper and the literature. Section 2 describes policies adopted by President Rousseff that affected the value of Petrobras during her first term in power and provides information about the 2014 Brazilian election. Section 3 explains the empirical model. Section 4 describes the data and estimation and discusses the intuition for identification. Section 5 presents and discusses the results and Section 6 concludes.

### 1.1. Related literature

This paper is related to a literature that studies the effects of elections on asset prices to gauge how different parties affect the economy. Herron (2000) finds that higher interest rates and lower stock market prices were expected had the Labour Party won the British elections in 1992; Knight (2006) studies how the odds of a victory for Bush or Gore in the 2000 American election affected the market value of politically sensitive firms and finds that policy platforms were capitalized into equity prices; Imai and Shelton (2011) show that share prices of Taiwanese firms with investments in the mainland responded strongly to a positive electoral outlook for the party that advocates lifting caps on cross-strait investment in mainland China; and Snowberg et al. (2007) study how the Bush reelection in 2004 affected stock markets and find that electing a Republican President raises equity valuations by 2–3%.<sup>3</sup> Closely related to this literature, Wolfers and Zitzewitz (2009) estimate the effect of the Iraq War on oil prices and on the U.S. stock market.

This paper is also related to a literature that connects political risk, market volatility and uncertainty premia. Pantzalis et al. (2000) find positive abnormal returns in the weeks leading to an election in their sample of 33 countries. Brogaard and Detzel (2015), employing the

uncertainty measure of Baker et al. (2016), also find that economic policy uncertainty is associated with positive abnormal returns. Using options, Kelly et al. (2016) assess the effect of political risk on asset prices studying events like summits and elections. They show that options whose lives span political events are on average 5% more expensive than otherwise similar options. Goodell and Vähämaa (2013) also find a link between stock market volatility and political uncertainty using the VIX volatility index and data from the Iowa Electronic Markets over five US presidential elections.

A growing empirical literature examines how political connections affects firms. Fisman (2001) estimates the value of political connections in Indonesia by assessing the effect of news about President Suharto's health on firms with differing degrees of political exposure; Johnson and Mitton (2003) argue that Malaysian capital controls provided a screen behind which favored firms could be supported; Khwaja and Mian (2005) argue that politically connected firms in Pakistan default on loans that are taken with the intention of not being returned; Leuz and Oberholzer-Gee (2006) argue that foreign securities and close political connections are substitutes; Faccio (2006) uses data from many firms in 47 countries and finds significant abnormal returns for establishing political connections; Faccio et al. (2006) show evidence that politically connected firms are more likely to be bailed out; Ferguson and Voth (2008) assess the value of political connections in Nazi Germany; Acemoglu et al. (2018) show that street protests in Egypt are associated with lower stock market value for firms connected to the group in power.

Previous work has explored the link between finance and politics in Brazil. Claessens et al. (2008) show that political connections affect access to bank finance in Brazil, which in turn affects stock returns. Carvalho (2014) presents evidence that BNDES, the Brazilian development bank, expands (subsidized) loans in politically attractive regions right before elections. Fernandes and Novaes (2016) study the role of the Brazilian government as a large shareholder in recent years. They show that government activism lowered the value of minority shareholders' voting rights, which harmed minority shareholders in Brazil.

A sizable empirical literature shows that state owned firms are usually less profitable than private companies.<sup>4</sup> Hence, all else equal, state controlled firms are worth less than private companies. By showing that Petrobras is subject to very large political risk, this paper points out that this difference can be strongly affected by the incumbent government – at least in emerging economies, where institutions are strong enough to allow for the existence of capital markets, but may fail to prevent policies that negatively affect the value of a state-controlled company for its shareholders.

A sizable literature has emphasized the effect of slow-moving institutional and legal factors on the rights of minority shareholders.<sup>5</sup> This paper asks whether changes through elections can also have a large impact on the value of a state-controlled company.<sup>6</sup>

One distinguishing feature of our paper is the use of stock options to estimate both the probability of each outcome and their effects on the value of the company. Data on options have been used to extract

<sup>4</sup> For example, Boardman and Vining (1989) and Dewenter and Malatesta (2001) compare the largest private-owned and government-owned firms and find the former are, on average, significantly more profitable. La Porta and Lopez-de Silanes (1999) use data from privatized firms in Mexico and find that productivity gains are the main drivers of the increased in profits from privatization. Sapienza (2004) finds that in Italy, all else equal, state-owned banks charge lower interest rates than do privately owned banks and attributes this difference to political distortions. Using data on Indian state-owned companies, Gupta (2005) finds that partial privatization has a positive impact on profitability, productivity, and investment. An exception in this literature, highlighting the value of political connections, is Calomiris et al. (2010). They argue that in China, the benefits of political ties outweigh the efficiency costs of government shareholdings. For a survey of the empirical literature on privatization, see Megginson and Netter (2001).

<sup>5</sup> See La Porta et al. (2000, 2002) and a literature that followed.

<sup>6</sup> There is a related discussion in development economics about the relative roles of institutions and macroeconomic policies (see, e.g., Henry and Miller, 2009).

<sup>3</sup> There is also a literature on the relation between stock returns and the party in power (see, e.g., Santa-Clara and Valkanov, 2003; Leblang and Mukherjee, 2005).

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