1 The Effect of Political Alignment on Public Federal Bank Lending

1.1.Introduction

The actual role played by state-owned banks has been intensely debated over the last years. Officially, public banks state their mission as the pursuit social targets[1]. However, many scholars have proposed opposing views. La Porta et al (2002) document that a higher share of state-owned bank "is associated with slower subsequent financial development and lower growth of per capita income and productivity". Following their seminal contribution, a vast literature[2] has investigated how political interference prevents state-owned banks from achieving their official social goals[3].

Brazil offers a good opportunity to address this issue. At the end of 2010, state-owned financial institutions underwrote 41% of all bank credit (BCB Financial Stability Report, 2011), most of it by banks under federal control. Except for BNDES (Brazilian Development Bank), all the main government-owned banks are commercial banks, competing with private banks for deposits and credit. By legal mandate, state-owned banks have large earmarked lending operations (directed credit) in comparison to private banks. Nevertheless, they also compete actively on the market-based sector, where interest rates and funding costs are set freely (non-directed credit). I am interested in how political determinants affect allocation of credit from commercial government-owned banks and its consequences on overall credit distribution across Brazilian cities. I go further and investigate what drives the favored lending and find evidence that non-directed credit from public federal banks grows even more than direct credit in politically aligned municipalities during the period analyzed.

[1] See Yeyati et al (2007) for an overview of the debate about the role of state-owned banks

[2] Kwaja&Mian (2005), Sapienza (2004), Cole(2009), Li et al (2008), Carvalho (2010) are some papers that investigate political determinants of credit from state-owned banks

[3] See Shleifer & Vishny (1994) and Shleifer (1998) for a general approach of the political influence on state-owned firms.

This paper uses a unique bank branch account level data to evaluate the impact of changes in political alignment from cities on public federal banks lending. I defined a city as aligned if the mayor's party has a member on the President's Cabinet. Two main channels explain why aligned cities should receive more credit. First, central government may be interested in favoring cities governed by allied parties in exchange for political support in Congress or in the subsequent elections. Also an indirect effect takes place as directors of public federal banks are nominated by the President and this process not always follows strictly technical criteria. Former governors of electorally relevant states in Brazil, *Rio de Janeiro* and *Bahia*, have been appointed as members of the Board of Directors of a public federal bank, although they don't have much experience in the banking business. Using the influence on the directors nominated by their party, mayors may obtain more access to credit in the public federal banks for their own supporters or for their city in general, aiming for public approval in response to more economic activity derived by credit abundance. In an interview for a local radio station, Valdemar Costa Neto, a Brazilian politician and board member of an aligned party (PR) made explicit his party's interest in a position in a Board of Directors from a Public Federal bank, as reported by *O Globo* (9/7/2011): "I want to appoint a member of the Board of *Caixa*, of *Banco do Brasil*. When I need anything I can get a loan for (a town named) Santa Isabel, about R$ 2 million, that Helio Buscarioli (the mayor) is requiring as he needs the air to breathe". In this same interview, he tells the importance of credit restriction and the political role in favoring access to credit: "The money is not released in Caixa. They don't authorize at Caixa. Having a Director, it is released quickly".

We have two sets of results. The first set exploits the outcomes of local and general elections held during the period 1997-2008 as a source of within-municipality variation in political alignment. I find that aligned cities (ruled by mayors from a party with the federal government's coalition) receive 10% more credit from public federal banks. In addition, I show public federal banks turbinate lending in aligned cities above and beyond private banks' lending, excluding demand-driven explanations. I also document that a credit increase in public federal banks crowds out private banks' lending in the aligned cities. Nevertheless, overall lending in aligned cities is 10% higher than in non-aligned .This net-positive increase in lending to aligned cities raises concerns about a misallocation of capital across cities. Restuccia & Rogerson (2009) argue that resource misallocation may have an important impact on aggregate total factor

productivity (TFP) and it could explain differences in output per worker across countries. Simulating a reallocation of capital and labor to equalize marginal products to the extend observed in the United States, Hsieh & Klenow (2009) find that China and India would obtain TFP gains respectively of 30-50% and 40-60%. Following this rationale, one could claim that if state-owned banks reallocated credit from aligned cities, it would result in welfare gains once firms located in non-favored areas, but with higher marginal productivity of capital than the ones in favored cities, they would have more access to credit in order to carry out their investment projects.

Once the effect of political alignment is documented, I take advantage of a more comprehensive credit database available only for a more recent period (since 2004) and investigate which types of credit are more susceptible to political influence at the municipal level. As I am interested in lending from commercial banks and its implication in the bank market as a whole, I test whether non-directed credit leads the growth in public federal bank lending. While directed credit might be explained for a social lending story, more lending in aligned cities due to a higher allocation of non-directed credit could not be justified by a development explanation. Therefore, using data of credit granted at the municipal-bank level, I apply a regression discontinuity design in close electoral races in order to test if higher public federal bank lending is driven by non-directed credit. I also test if the credit to firms increase in aligned cities. The results indicate that more credit to aligned cities occurs in response to a higher non-directed credit growth target at firms.

This paper contributes to the empirical literature on redistributive politics that test whether allocation of federal resources are set in order to favor regions politically aligned to central government (Arulampalam et al, 2008; Brollo & Nannicini, 2010; Dixit & Londregan, 1998; Grossman, 1994; Khemani, 2007; Solé-Ollé & Navarro, 2008). While this literature has focused on identifying political patterns in intergovernmental transfers, my results shed light on another source that may have an important impact on local development and electoral prospects: state-owned bank lending redistribution. Despite increasing credit underwritten in aligned cities, I do not find any change in the deposits from public federal banks in aligned places (which is evidence against alternative demand-driven explanations). The results that non-directed credit drives this redistribution indicate that the goodwill from more lending is appropriated by local government, because the federal government has no social or development argument to justify its

intention to favor determined places with non-directed credit. A stronger impact on local than on the central-level politics is a condition derived from basic theoretical models to predict more state-owned bank credit to aligned cities independently of the level of political competition, often characterized by a higher proportion of voters not ideologically attached to any party (*swing voters*)[4].

My paper is also related to the empirical literature on political influence over government-owned banks. Kwhaja & Mian (2005) associate the use of political connections in order to extract private rents. Li et al (2008) document that political connections help in obtaining an initial loan. Rather differently, I find that public federal banks favor cities ruled by politicians aligned with the presidential party coalition. The pattern observed is also different from the tactical redistribution on electoral years in favor of swing districts, as documented by Cole (2009) in India. Closely related to my investigation is Sapienza (2004), who examines the behavior of government-owned banks in Italy and find evidence that firms borrowing from both types of banks (private and state-owned) are charged a lower interest rate from the state-owned bank with a local politician affiliated to the bank. She identifies some evidence of political patronage based on interest rate results from credit lines. In contrast, I show that public federal banks allocate a larger amount of credit in favor of politically aligned areas. While she restricts analysis to credit lines and focuses on firms that borrow from government and private banks, I consider the overall credit and document both economic and statistically significant impact of political alignment on public federal bank lending.

My paper is also related to Carvalho (2010), who focuses on subsidized lending and who evaluates the political use of BNDES to influence investment and employment decisions of Brazilian firms. He shows evidence that firms eligible for BNDES lending expand employment in states with central government allied incumbents near reelection years. According to his research, there is no such impact on ineligible firms and these expansions are only important for incumbents facing strong political competition.

Carvalho (2010) and my paper share the same empirical setting (Brazil) and test whether state-owned banks favor political allies. However, there are important differences between the two articles. First, Carvalho (2010) focuses on subsidized credit from BNDES while I study

[4]See Arulampalam et al (2009) develop a model for redistributive politics in order to explain center-state transfer that can be applied for credit redistribution as well.

directed and non-directed credit from commercial public federal banks. More importantly, I find evidence that non-directed credit drives favored lending. It is worth pointing out that BNDES is a development bank with a mission to "foster sustainable and competitive development in the Brazilian economy, generating employment while reducing social and regional inequalities". In contrast, other state-owned banks included in my study fund in normal deposit markets for the general public and compete in credit market with private banks[5]. While directed credit requirements restrict the number of firms eligible for subsidized lending, all firms a priori are entitled to access non-directed credit from commercial state-owned banks. Thus, the channel I explore is very different from the channel implicit in lending by large development banks with special funding such as BNDES. Subsidized credit from BNDES may be reallocated in order to influence investment and employment decisions from some big firms that have the power to change a political environment near elections on a state level. In contrast, credit from commercial public federal banks at the municipal level tends to reward local supporters or to foster local development in a more indirect way. Finally, while subsidized credit is (supposedly) more accountable and should be justified by some social argument, non-directed credit from commercial public federal banks is subject to confidential banking rules and its performance is more difficult to isolate from the total lending issued by the bank.

This paper proceeds as follows. The next section provides some basic background information on banking and politics in Brazil and describes the data. Section 3 develops the empirical strategy. The results are presented in section 4, followed by robustness checks and validity tests in section 5. Section 6 describes the conclusions.

[5] CAIXA, a large federally-owned savings and loans institution, has a large savings deposit base, but competes for savings funds with other private banks. Arguably, Banco do Brasil, the largest federal bank, has an edge in funding due to what can be described as an implicit guarantee from the Treasury. Nevertheless, it is hard to see much difference in funding costs when Banco do Brasil is compared with large private banks.

1.2. Background and Data

1.2.1. Institutional Environment

Brazil is a federal presidential democracy with three layers of government: central, regional and local. The central level is formed by the President and the National Congress, made up of the Chamber of Deputies (with 513 members) and the Federal Senate (with 81 members). There are 27 regional governments (26 states and 1 federal district) ruled by a governor and a legislative assembly. The local level is composed of 5565 municipalities, each one ruled by an elected mayor and an elected city council.

Brazil has a multi-party system, with parties acting in the whole country and in all levels of government. Frequently lacking majority in Congress, presidents need to form coalitions in order to obtain legislative support needed to govern effectively[6]. These coalitions are observed in the composition of President´s Cabinet. During the period analyzed, there were two presidents from the main opposition political parties in command: Fernando Henrique Cardoso (FHC) from PSDB (*Partido da Social-Democracia Brasileira*) and Luís Inácio Lula da Silva (Lula) from PT (*Partido dos Trabalhadores*). Both presidents governed for eight years, being reelected after their first term. Power changed hands in 2003. I use the Cabinet's composition to identify the main parties of Presidential Coalition (Amorin Neto, 2006). Although there are other forms to obtain Congressional support, as pointed out by Zucco Jr & Melo-Filho (2009), having a position in the Cabinet shows a minimum party's strengths in the coalition, which is necessary to influence public federal bank credit allocation in favor of a city ruled by that party.

Based on his Cabinet's composition, FHC had political support in his 8 years of government from five parties: PSDB, PFL, PMDB, PTB and PPB. However, the cabinet's composition changed during Lula's mandate. Beginning in his first year, Lula worked with six parties: PT, PV, PSB, PC do B, PPS, PL and PTB. In January 2004, PMDB had two ministers (Ministry of Social Security and Ministry of Communications) and, since 2005, the Minister of the Cities was chosen from the PP party. The PDT party took part in the government through the

[6] See Zucco Jr & Melo-Filho (2009) for a analyses of how Presidents obtain legislative support in multiparty legislatures and Zucco Jr (2009) for a descriptive view of political environment in Brazil

Minister of Labor and Employment in 2007 and the PPS party leaves the Cabinet at the end of 2004.

1.2.2. Data

I rely on two primary banking data sets provided by the Central Bank of Brazil (BCB): Estban (Monthly Banking Statistics) and SCR (Credit Information System). While Estban comprises basic account information since 1995 of every bank branch authorized by BCB, SCR collects detailed information about any individual loan contracts over R$ 5 thousand granted by banks to any customer since 2004. The electoral variables – candidates and winners of municipal elections, their parties and margin of victory – come from Brazil Electoral Court (*Tribunal Superior Eleitoral* – TSE).

Estban provides information on the amount of loans, deposits and total assets in each bank branch. I work with this data aggregated by municipal-year and bank type level (public federal, public state, under federal intervention or private). Despite not being so comprehensive, this database is available for a longer period than SCR. I take advantage of this longer-term perspective with the empirical strategy to estimate the impact of changes for the same city in the political alignment. As I just have electoral information at the municipal level since 1996, I restrict the analysis to the period 1997-2008.

I divide Brazilian commercial banks into four types according to their ownership structure: public federal, public state, private and under federal intervention. Public federal banks are comprised of the Banco do Brasil (BB), Caixa Econômica Federal (CEF), Banco do Nordeste do Brasil (BNB) and Banco da Amazônia (BASA). While BB and CEF have a broader coverage in Brazilian territory with branches in 78% and 31%, respectively, of municipalities, BASA and BNB act in the North and Northeast areas, with branches in 3% (BASA) and 5% (BNB) of Brazilian cities[7]. On the other hand, private banks presence rates vary from 46% (1995) to 67% (2003), with 63% of municipalities having at least one private bank branch at the end of 2008.

Banks under federal intervention are the result of PROES (*Programa de Incentivo a Redução do Setor Público Estadual na Atividade Bancária*). This program aimed to reduce the

[7] The data represents the presence of those banks at the end of 2008. The BB presence changes from 64% to 78% while the other public federal banks kept a constant participation

role of the public state bank, especially those under financial distress due to bad management and political influence over the years (Salviano Jr, 2004). The process of restructuring public state banks included extinction, privatization, or federal intervention followed by privatization or federal intervention followed by nationalization or return to former state control[8]. In December 2008, only 6 banks, compared to 64 in August 1996, were under State control: Banestes (ES), Banrisul (RS), Nossa Caixa (SP), Banese (SE), BRB (DF) e Banpará (PA).

Although Estban covers more than 10 years of account information related to credit, deposit and value of total assets, it doesn't permit distinguishing among types of credit – whether non-directed credit or directed credit – or type of borrower – firms versus individuals. I rely on the SCR credit database in order to overcome this limitation. Available since 2004, I gather aggregated information on credit granted at municipal-year level by types of bank, credit and borrower. This database is different from Estban in the geographic aspect, once the municipality where the credit is granted is related to the borrower address instead of to the location of the bank branch. For this reason there are 4593 municipalities in the whole sample from SCR, while the Estban sample comprises just 3845 cities.

Table 1.1 presents summary statistics for the variables of interest for Estban (panel A) and SCR (panels B and C). I show on panel A descriptive statistics by type of bank for credit, deposit and total assets. I include measures of levels and growth of these variables, because I will compare differences in credit growth between aligned and non-aligned cities in the empirical methodology. Despite a higher growth of assets and deposits from private banks, credit increases 13% in both private and public federal banks. Aggregated at a municipality level, the mean growth of credit and deposit are similar and less than the credit increase from private and public federal banks. This can be attributed to the process of intervention and liquidation of public state banks or mergers and acquisition among private banks. The observed means being much higher than medians shows evidence of banks concentrating their activities in the bigger cities.

[8] See Salviano Júnior (2004) for a compreensive report about PROES

1.3. Empirical Strategy

The main objective is to test whether public federal bank lending is affected by political alignment at the municipal level. To estimate this effect, the ideal experiment would be randomly assign the party in charge of each municipality and then measure the difference of credit granted by the public federal bank between the group of cities ruled by parties from President's Coalition and the group of cities governed by other parties. As this experimental design is not possible to implement, I rest on both credit databases available – Estban and SCR – and exploit the within-municipality variation in political alignment or the discontinuity in the margin of victory of close elections races as source of exogenous variations to address this issue.

As a first approach, I follow a city over time and test whether changes in political alignment resulting from local or central elections have impact on the credit growth from the public federal bank located in that city. Taking advantage of the longitudinal structure of the Estban database, I employ a differences-in-differences methodology to estimate the impact of political alignment on credit growth of public federal banks, controlling for unobserved invariant municipal characteristics (α_i) and for time-specific effect (δ_t). Equation (1) below describes the basic empirical specification to test the effect of political alignment on credit growth of public federal banks in city (i) in a year (t):

$$\Delta \log(credit_{it}) = \alpha_i + \delta_t + \beta_1 . aligned_{it} + X_{it} . \gamma + \mu_{it} + \varepsilon_{it} \qquad (1)$$

where the dependent variable $\Delta log(credit_{it})$ indicates the credit growth, and $aligned_{it}$ is an indicator variable for whether the city (i) is politically aligned to the central government at time (t). X_{it} is the vector of other explanatory variables such as $log(total\ assets_{i,t-1})$, dummies for governor x term-of-office and state trends. I control for bank size ($log(total\ assets_{i,t-1})$) to avoid that the results are driven by cities with small bank presence (and therefore more sensitive to credit variation due to their small size). I include governor x term-of-office dummies to control for governor's mandate fixed-effect in order to isolate non-parametrically any kind of political preference towards the governor instead of the mayor. State trends control for state differences that could influence credit growth. The parameter of interest in equation (1), β_1 measures

whether public federal banks credit grew at a different rate when the city is ruled by an allied party.

Although equation (1) employs a broad set of controls, including city and time fixed effect, a remaining identification concern is that β_1 may still be biased due to omitted time-varying municipal level variables correlated with political alignment (μ_{it}). Average municipal levels of entrepreneurship, schooling and other cultural features may be associated with credit demand and to a more or less chance of the electorate being influenced by the economic strength of parties allied to the federal government. While I have available annual measures of GDP and population at the municipal level since 2000, other omitted variables correlated to credit demand threaten the identification strategy of equation (1).

In order to control for unobservable variables correlated to credit demand at the municipal level, I compare credit growth between public federal and private banks. Restricting the analysis to cities where both types of banks are present, I evaluate the impact of political alignment in public federal banks *vis a vis* private banks. I assume in this case that shocks in credit demand are absorbed in a similar way by public federal and private banks. This strategy consists in a triple-differences estimation. I use the following specification in the subset of cities with public federal and private banks:

$$\Delta \log(credit_{ijt}) = \alpha_{ij} + \delta_{jt} + \beta_1 . aligned_{it} + \beta_2 . aligned_{it} xgov_j + X_{ijt} . \gamma + \nu_{ijt} + \varepsilon_{ijt} \qquad (2)$$

where in addition to the variables in (1), the additional subscript *(j)* specifies the type of bank, gov_j is an indicator variable for government-owned bank (public federal), α_{ij} is city-type of bank fixed effect and δ_{jt} is time effects allowed to vary by type of bank. The parameters of interest in equation (2) are β_1 and β_2. While β_1 measures the variation in credit growth due to political alignment independently of type of bank, β_2 captures an additional increase (or decrease) in credit growth for public federal banks relative to private banks. The bank-city fixed effect implies that this difference due political alignment in credit growth is for the same city over time.

As mentioned above, the identification strategy of equation (2) rests on the assumption that unobservables (v_{ijt}) aren't correlated to the chances of electing a mayor from an aligned party. Some locations that are target of public policies from the federal government may attract

more electoral interest from allied parties looking for the advantages of more federal transfers. This implies that allied parties may spend more efforts to win the elections in those places, which may increase their chance of victory. On the other hand, as the central government uses public federal banks to carry out payments and to direct credit toward specific goals, I expect more public federal bank lending in those locations. In that case, public federal banks increase their lending more in response to public policy targets and not because of political alignment.

In order to rule out any concern about the direction of causality on equations (1) and (2), I rest on Regression Discontinuity Design (RDD) methodology (Imbens & Lemieux, 2007). Taking advantage of SCR, I use data of credit granted by public federal banks from 2005 to 2008, which is a better measure of lending than credit growth at city-type of bank level. The strategy is finding exogenous variation from discontinuity in margin of victory in close races, which is consistent with recent literature in political economy (Lee et al, 2004).

So as to exploit the exogenous variation in political alignment provided from close races, I restrict the sample to those municipalities where just one candidate from aligned parties and one candidate from other parties ran in the 2004 election for mayor. The measure used as determinant of alignment – treatment group – is the margin of victory, denoted by the difference between the share of votes from the allied candidate and the share of votes from another competitor (it will be positive if allied candidate wins and negative otherwise). In those elections with margin of victory near 0, the assignment of treatment (political alignment) may be considered as good as random since the close victory may have been decided by chance. If political alignment results in more public federal bank lending, a discontinuity is expected in the regression of total credit over a polynomial function of margin of victory in the neighborhood of 0. The difference of credit granted between aligned and non-aligned municipalities near the threshold 0 is evidence of the role of political alignment in public federal bank lending. To exploit the discontinuity in margin of victory which determines political alignment, I estimate the following model for a city *(i)*, from state *(k)* and year *(t)*:

$$\log(credit_{it}) = \beta_1.aligned_i + f(W_i) + \beta_5.aligned_i xf(W_i) + \alpha_k + \delta_t + \lambda.control_{i2004} + \varepsilon_{it} \qquad (3)$$

where W_i is the difference in vote shares between aligned and non-aligned cities and $f(W_i)$ is a smooth continuous function of margin of victory. I control in the above equation, for the

value of dependent variable in 2004, state dummies (α_k) and time dummies (δ_t), because the results comprise a credit grant from the years 2005 to 2008.

Once the impact of political alignment on the amount of credit granted by public federal banks is documented, I go further and examine what features underlie this favored lending. I use the same RDD methodology to investigate whether a larger increase in the amount of credit is driven by non-directed credit or directed credit, or which type of lender receives more loans: firms or individuals.

Directed credit is a type of credit granted with better conditions than non-directed credit (lower interest rates, longer terms). It's also recognized by people as an instrument of central government public policy and borrowers who have access to this type of credit may associate the benefit with the central government instead of with the local mayor. In this case, redistributive politics literature (Arulampalam et al, 2008; Brollo & Nannicini, 2010; Solé-Ollé & Navarro, 2008) and literature on political use of state-owned banks (Cole, 2009 and Carvalho, 2010) document that the government targets locations with higher political competition in order to influence electoral outcomes. On the other hand, more non-directed credit in aligned cities is an indirect benefit more likely to be appropriated by the mayor, as it could result in more access to credit for mayor's supporters or just being used as a tool in order to foster local economic growth. Redistributive politics literature predicts that when the benefits of resource allocation are more appropriated by local governments, aligned locations will be favored despite the level of political competition.

I also test whether more credit from public federal banks are destined to firms. Following the rationale above, more credit to firms have more impact in favoring mayors supporters or to promote local development by an investment and employment channel. In both cases, this strengthens the political power of local mayors, increasing their chances of being reelected, electing their successors or being able to be appointed to another public position at a higher level.

1.4. Results

1.4.1.Do aligned municipalities receive more credit from public federal banks?

Table 1.2 presents the results of estimating equation (1) in order to test whether aligned cities are favored with more credit from public federal banks. Taking the sample of all cities with public federal bank branches, columns (1) to (4) show that total credit from public federal banks in aligned cities grows 1.3 percentage points more than in non-aligned municipalities in the full specification (column (4)). This result is statistically and economic significant, since this figure accounts for 10% of the average credit growth of public federal banks at the municipal level in the period analyzed. Looking at it from another perspective, total lending from public federal banks in the whole country increased 75% from December 1996 to December 2008, which is equivalent to average expansion of 4.8% a year in this period. Relative to this aggregate growth, the impact of political alignment represents 25% of the expansion of public federal bank credit[9].

Column (5) exchanges credit for deposits in specification (1). As there is no impact on deposit growth for public federal banks in aligned locations, a larger increase in credit growth is not funded by more resources available from the public for public federal banks in the favored cities. This result strengthens the interpretation of credit redistribution from public federal banks, since it rules out an alternative explanation related to more credit demand or higher offer of savings in those favored locations.

As the estimates from table 1.2 may be biased by unobservable variables correlated to credit demand, table 1.3 compares credit growth between public federal and private banks. Besides reinforcing the evidence from table 1.2, table 1.3 shows that private banks decrease credit growth in aligned cities. Total effect of public federal banks in aligned cities is obtained by the sum of coefficients ($\beta_1+\beta_2$) and is similar to the impact documented in table 1.2.

Lending from private banks being crowded-out by public federal bank lending reinforces the political motivation assumption and its likely distortion. As public federal banks are located in several states, larger increases in some municipalities in relation to others suggest a lending

[9] Data from Central Bank of Brazil available on its internet site shows that the amount of loans from 4 public federal commercial banks (BB, Caixa, Basa e BNB) – values of September 1994 – have increased from R$ 48 billion in Dezember 1996 to R$ 84 billion in the end of 2008.

strategy in favor of some preferential locations. If this strategy was planned to favor more productive areas, a decrease in private bank credit would not be expected in those places. Otherwise, selecting cities based on political considerations raises the marginal cost of public federal banks in their loans to other cities, which makes it more attractive for private banks. This outcome is expected in a model of oligopolistic competition in the Brazilian credit market, with private and public federal banks undergoing multimarket quantity competition in a framework similar to the one described by Bulow et al (1985). Assuming that lending marginal cost of banks are increasing and that credit from private and public federal banks are strategic substitutes, a political shock that raises the credit offers from public federal banks in one market will make private banks more aggressive in other cities, which explains the results of table 1.3.

As mentioned before, even controlling for fixed effects, one could raise doubts about the direction of causality between political alignment and credit from public federal banks. Determined characteristics, related both with a higher chance of electing an ally and with a larger offer of public federal bank credit, could harm the interpretation so far that the estimates are evidence of political use of public federal banks in order to favor aligned cities. To address this issue I rest on RDD methodology, exploiting exogenous variation in political alignment provided by close electoral races run by one allied candidate and one non-allied in the 2004 mayoral election.

Exploring the SCR data set from 2005 to 2008, I show in Figure 1.1 evidence from close electoral races of the impact of political alignment on credit granted by public federal banks. The horizontal axis measures the margin of victory of aligned parties. The solid line represents a fourth order (quartic) polynomial fit of the residuals from log(Credit) regression on dummies of states and year. The vertical dashed line in 0 represents the threshold that determines the difference among cities aligned (greater than 0) and nonaligned (less than 0).

As apparent from the figure, there is a discontinuous jump, right at the 0 point. The discontinuity in the neighborhood of this threshold indicates that, in elections decided by chance, aligned cities on average received more credit from public federal banks than non-aligned cities. Table 1.4 presents the point estimates for the Regression Discontinuity Design, varying the polynomial order. For the quartic polynomial fit, I estimated an average impact of 20% for the four following years after the election on the credit granted in aligned cities compared to non-

aligned. This coefficient is significant at 5%, employing standard errors clustered at the municipal level.

1.4.2. Does political alignment distort total credit allocation across cities?

Once I have documented the political alignment influence on allocation of public federal bank lending, what remains is to investigate its impact on total credit distribution across cities. As public federal banks play a major role in the Brazilian credit market, one should expect that its behavior will result in more credit on politically favored places. One concern related to this assumption is the response of private banks that refrain from expanding lending in politically aligned cities in order to increase in the other places. To test the impact on credit distribution of public federal banks favoring politically aligned cities, I run the specification (1) exchanging credit from public federal banks by total credit granted in the cities.

According to results shown in Table 1.5, total credit growth increases 1.2-1.3 percentage points more in politically aligned cities. This impact is economically significant once I observe a 10.4% average growth of credit in all cities of the sample from 1997 to 2008. This distribution of total credit in favor of politically aligned cities raises concerns about a likely misallocation of capital across cities. Identical firms located in different cities may have different access to credit as a result of political influence distortion. Therefore, the aggregate total factor productivity (TFP) may increase if credit is reallocated from politically favored areas toward non-politically aligned cities, as firms in those places may have higher marginal productivity than the ones in aligned cities (Restuccia & Rogerson, 2009; Hsieh & Klenow, 2009)

1.4.3.What drives credit redistribution of public federal banks?

The results presented so far show that credit from public federal banks are allocated in order to favor politically aligned cities. In this section, I aim to identify what type of credit (free versus directed credit) and what type of borrower (firms versus individuals) are the ones most benefitted from the favored lending. As discussed in Section 3, while directed credit is expected to be used in order to influence electoral outcomes in places facing higher political competition

(Cole, 2009; Carvalho, 2010), non-directed credit is the type of lending whose benefits are expected to be appropriated by local governors and, therefore may be influenced to favor areas ruled by ally mayors independently of the local political competition.

Figure 1.2 presents the same RDD specification applied to total credit, now disaggregating the data by type of credit. The left-hand graph shows the impact of political alignment on directed credit, while the graph on the right depicts the effect on non-directed credit. The figure shows that non-directed credit drives the impact of political alignment on total credit of public federal banks. Table 1.6 presents the point estimates for the Regression Discontinuity Design, varying the polynomial order, for both directed and non-directed credit. I observe a statistically significant impact of aligned party victory for all polynomial orders.

Another dimension of interest when investigating the effect of political alignment is the type of borrower. Given the potential in increasing employment and investment or to reward political supporters, credit destined to firms are more suited to be chosen in order to favor politically aligned cities than credit to individuals. Following the same RDD methodology, I investigate which type of borrower is more affected by the impact of political alignment.

Figure 1.3 shows evidence that while credit destined to firms is impacted by political alignment, credit to individuals is not. Table 1.7 presents the point estimates for the Regression Discontinuity Design. Results confirm the conjecture that Public Federal Banks favor aligned cities, granting more non-directed credit to firms.

1.5. Robustness and Validity Tests

1.5.1.Robustness Checks on Diff-in-Diff Estimations

I add time-varying economic controls (GDP, Population, Proportion of Agricultural Product on GDP) to specification (1) and the presence of private banks, public state banks and banks under intervention. The purpose of this check is to rule out any confounding factors related with credit offer and chances of candidates from allied parties having been elected in a given city. Table 1.8 presents the results from these tests.

I observe that, if anything, the addition of controls strengthens the results. Columns (3) and (4) indicate a negative and significant coefficient for the presence of the under intervention bank, which indicates that public federal banks increases their lending when intervention ends. This value may be explained by the fact that public federal banks assumed part of the assets or even specific clients from these banks when they were privatized or extinct.

The socio-economic coefficients indicate a smaller lending growth for public federal banks in cities with larger growth in GDP and those with less proportion of agricultural product in GDP. The first is associated with the social role of public federal banks, which has a more determinant presence in regions with lower economic perspectives, while the second is associated with public federal banks having a higher market share in agricultural credit.

1.5.2.Validity Tests for Regression Discontinuity Design

I now test the validity of Regression Discontinuity Design. First, I check whether discontinuity in public federal bank lending occurs also in the electoral year. As credit in the electoral year is predetermined with respect to the treatment variable, one shouldn't observe any discontinuity around the threshold 0 of victory margin. I further check for the presence of discontinuity in town characteristics and whether lending from private banks are affected by aligned party victory. Figure 1.4 shows no discontinuity with respect to these variables.

1.6. Conclusion

This essay provides evidence that politically aligned cities are favored with more credit from public federal banks. The estimates indicate that public federal banks increase their lending 10% more when the mayor's party has a member in the President's Cabinet. Resting on a regression discontinuity design methodology, I also document that non-directed credit and credit to firms increases more when an aligned candidate takes office.

These results are relevant for several reasons. First, they evidence that political influence may have an important impact on determining how credit of public federal banks is allocated. If there is a political determinant tied to the credit offer, especially on non-directed lending, there are strong chances that public federal banks are not maximizing profits or pursuing their official social targets. Second, as public federal banks compete with private banks in the Brazilian credit market with a relevant market share, a suboptimal behavior of public banks may amplify market failures instead of diminish them. Indeed, I document that total credit increases more in an aligned city than in a non-aligned one. This raises a concern about a likely misallocation of credit among Brazilian cities. In fact, according to Hsieh & Klenow (2009), one should expect social gains if credit was allocated to attend regions with a higher marginal product of capital instead of those chosen based on political criteria.

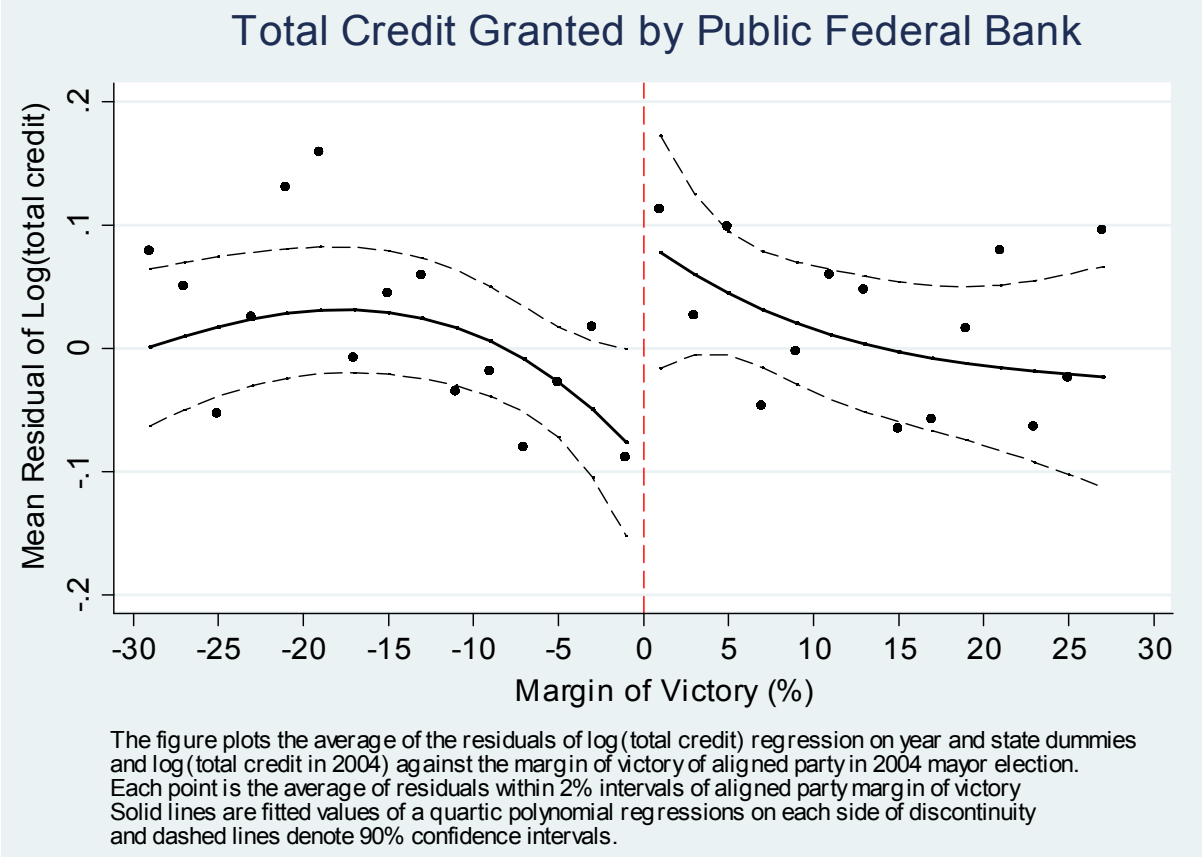


Figure 1.1 **Effect of Political Alignment on State-Owned Bank Lending: Evidence from Close Electoral Races**

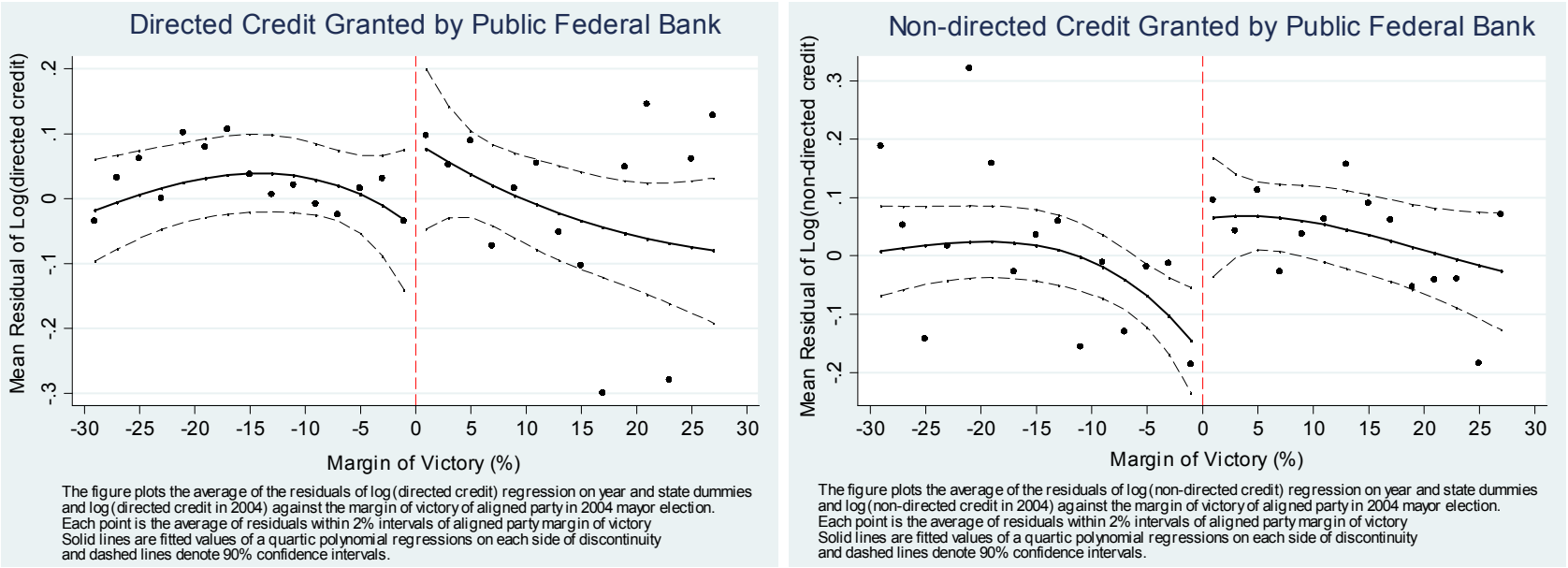
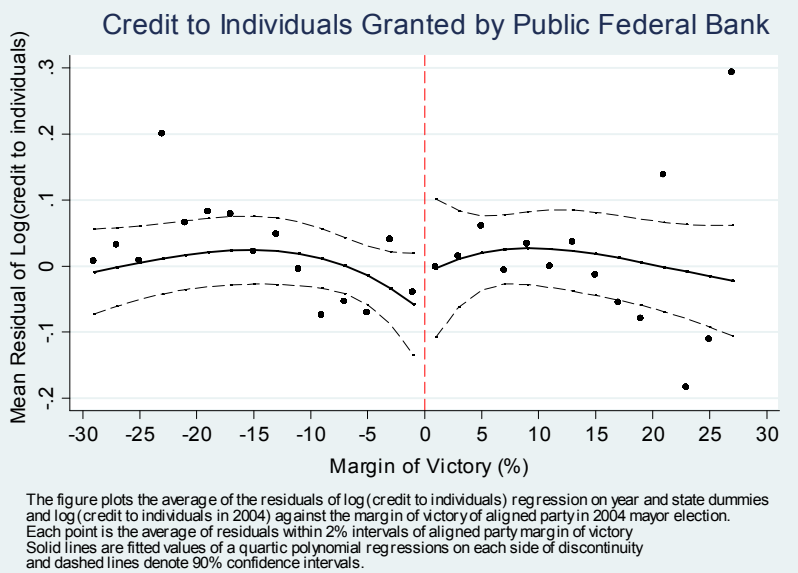


Figure 1.2 **Effect of Political Alignment on State-Owned Bank Lending by Type of Credit**



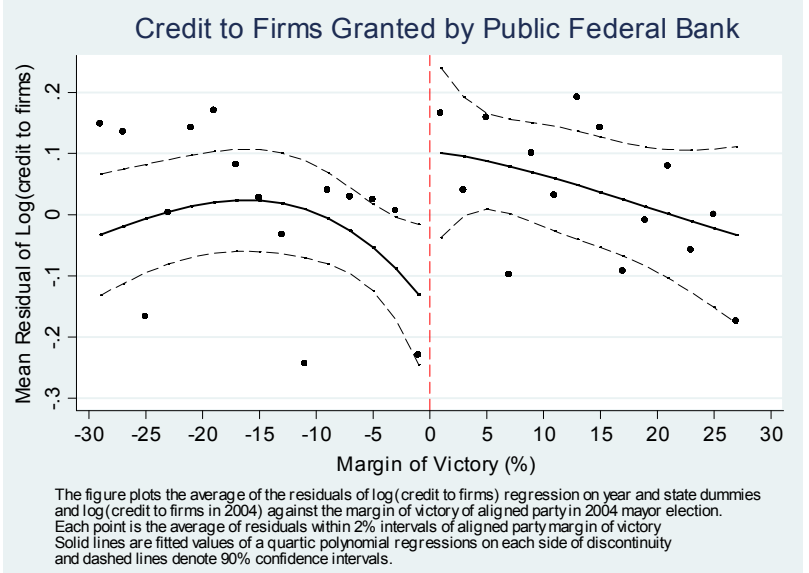


Figure 1.3 – **Effect of Political Alignment on State-Owned Bank Lending by Type of Borrower**

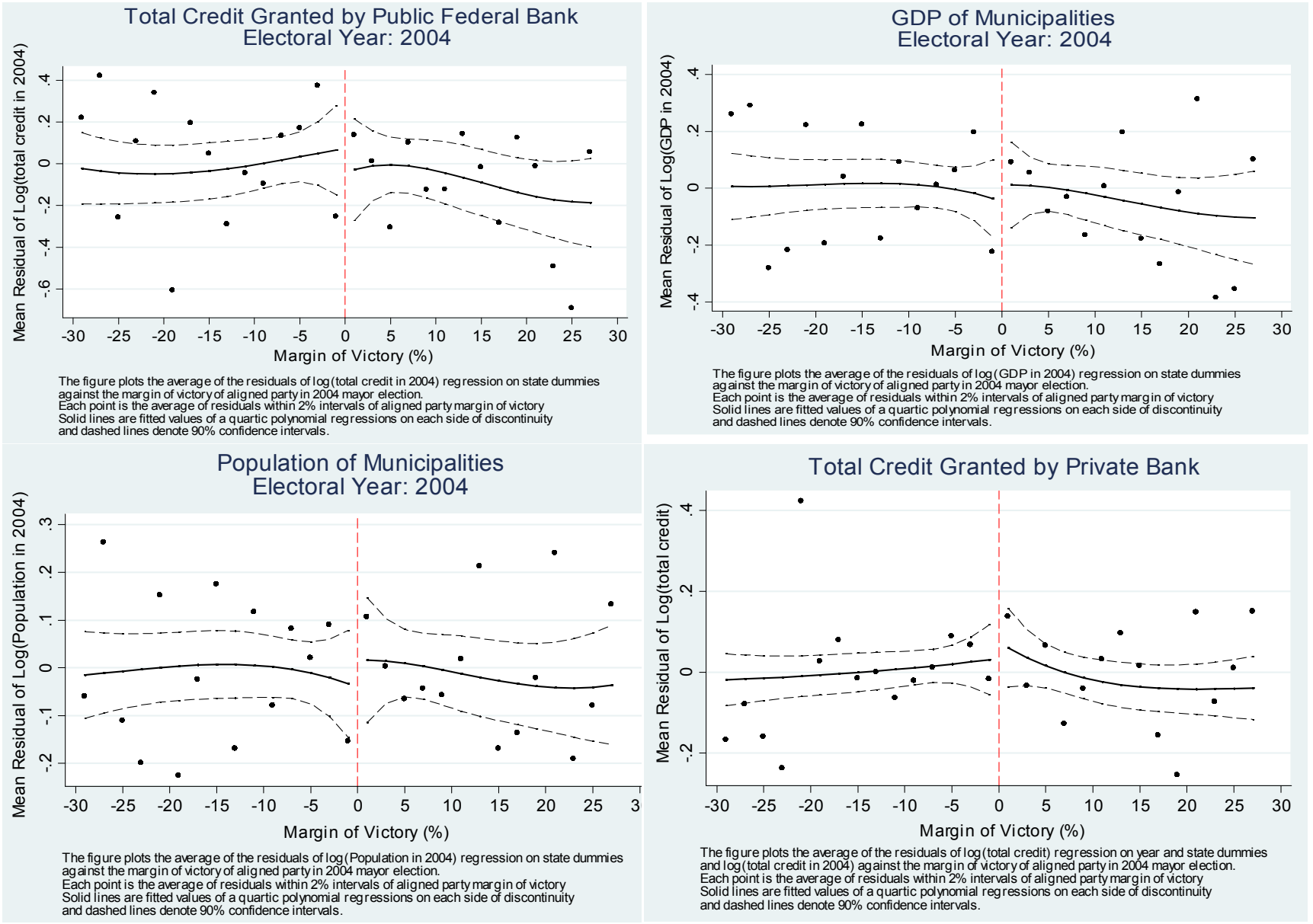


Figure 1.4 – **Validity Checks: Testing for Discontinuity of Public Federal Bank Lending in 2004, municipal characteristics and the Effect for Private Banks after the Election (Placebo)**

Table 1.1 - Summary Statistics

Panel A: Account Data by Type of Bank at the Municipal Level for the Period 1997-2008 (Estban)

Variable		Bank Type	Obs	Mean	Median	Stand. Dev.
Total Credit	level*	Under Intervention	3,846	2,271	416	30,900
		Private	24,284	45,800	964	1,030,000
		Public State	12,924	4,944	966	44,700
		Public Federal	28,397	21,000	4,993	166,000
		All banks	40,225	44,300	2,948	932,000
	Δlog	Under Intervention	2,981	11.4%		56.6%
		Private	23,245	13.1%		52.4%
		Public State	12,807	2.8%		52.9%
		Public Federal	27,789	13.0%		39.2%
		All banks	39,726	10.4%		41.5%
Total Deposit	level*	Under Intervention	3,846	2,865	373	29,900
		Private	24,285	20,700	1,759	317,000
		Public State	12,907	5,721	1,624	37,600
		Public Federal	28,404	18,000	3,314	134,000
		All banks	40,225	27,300	2,738	367,000
	Δlog	Under Intervention	2,981	2.7%		52.5%
		Private	23,246	16.1%		50.0%
		Public State	12,789	9.4%		37.4%
		Public Federal	27,797	12.2%		31.0%
		All banks	39,731	11.3%		32.2%
Total Assets	level*	Under Intervention	3,847	184,700	1,833	4,150,000
		Private	24,285	2,649,000	5,014	106,000,000
		Public State	12,930	139,000	5,256	2,790,000
		Public Federal	28,417	442,900	12,792	7,070,000
		All banks	40,225	1,970,000	9,233	86,500,000
	Δlog	Under Intervention	2,981	22.8%		78.2%
		Private	23,246	12.5%		33.6%
		Public State	12,812	8.5%		41.1%
		Public Federal	27,807	4.6%		57.4%
		All banks	39,731	6.5%		45.6%

*R$ thousands of oct/1994

Panel B: Credit Granted by Type of Bank at the Municipal Level for 2005-2008 (SCR - whole sample)

Variable	Obs	Mean	Median	Stand. Dev.
Total Credit	18572	19,300	1,719	236,000
Non-Directed Credit	18572	14,600	881	210,000
Directed Credit	18572	4,715	619	32,500
Credit to Firms	18572	13,900	636	203,000
Credit to Individuals	18572	5,356	777	41,300
Proportion of Credit to Firms	18572	48%	46%	29%
Proportion of Non-directed Credit	18572	58%	62%	25%

Note: Credit granted in current R$ thousands. Sample of 4643 municipalities.

Panel C: Credit Granted by Type of Bank at the Municipal Level for 2005-2008 (SCR - restrict sample)

Variable	Obs	Mean	Median	Stand. Dev.
Total Credit	4540	3,862	964	10,300
Non-Directed Credit	4540	2,209	451	7,187
Directed Credit	4540	1,653	392	4,388
Credit to Firms	4540	2,122	307	7,956
Credit to Individuals	4540	1,740	496	4,459
Proportion of Credit to Firms	4540	44%	40%	29%
Proportion of Non-Directed Credit	4540	54%	56%	26%

Note: Credit granted in current R$ thousands. Sample restricted to 1136 municipalities where there were observed only one candidate from aligned parties and one from opposition running for the mayor election in 2004.

Table 1.2 - Effect of Political Alignment on State-Owned Bank Lending (1997-2008)

Dependent Variable:	Δlog(Credit)				Δlog(Deposit)
	(1)	(2)	(3)	(4)	(5)
pref aliado	0.011**	0.012**	0.012**	0.013**	0.003
	(0.005)	(0.005)	(0.005)	(0.005)	(0.003)
log(Total Assets$_{t-1}$)				-0.128***	-0.100***
				(0.011)	(0.018)
Observations	27,677	27,677	27,677	27,677	27,680
R^2	0.064	0.075	0.093	0.133	0.261
Panel Units	2,696	2,696	2,696	2,696	2,695
City Fixed Effects	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES
State trends	NO	YES	YES	YES	YES
Governor's Mandate Fixed-Effect	NO	NO	YES	YES	YES

Notes: This table reports the effect of changes in political alignment in a given city over its lending (columns (1)-(4)) and deposit (column(5)) trends from a public federal bank. Column (2) controls for state-trends and column (3) adds governors mandate fixed-effect. Data from Estan - Monthly Banking Statitistics from Central Bank of Brazil. Standard-Errors reported in parentheses are clustered at the municipality level.

*** significant at 1% ** significant at 5% * significant at 10%

Table 1.3 - Effect of Political Alignment on State-Owned Bank Lending Compared to Private Bank Lending (1997-2008)

Dependent Variable:	Δlog(Credit)			
	(1)	(2)	(3)	(4)
Aligned City	-0.015*	-0.012	-0.016**	-0.015*
	(0.008)	(0.008)	(0.008)	(0.007)
Public Federal Bank x Aligned City	0.029***	0.029***	0.037***	0.038***
	(0.010)	(0.010)	(0.010)	(0.010)
log(Total Assets$_{t-1}$)				-0.164***
				(0.011)
Observations	32,983	32,983	32,983	32,983
R^2	0.160	0.167	0.193	0.225
Panel Units	3,254	3,254	3,254	3,254
City-Type of Bank FE	YES	YES	YES	YES
Year-Type of Bank FE	YES	YES	YES	YES
State trends	NO	YES	YES	YES
Governor Mandate Fixed-Effect	NO	NO	YES	YES

Notes: Regressions compare credit growth between public federal and private banks. Data are restricted to municipalities with public federal and private bank branches in an unbalanced panel. The unit of observation is a city-bank type (public federal or private) pair in a given year. Column (2) controls for state-trends and column (3) adds governors mandate fixed-effects. Data from Estan - Monthly Banking Statitistics from Central Bank of Brazil. Standard-Errors reported in parentheses are clustered at the municipality level.

*** significant at 1% ** significant at 5% * significant at 10%

Table 1.4 - Effect of Aligned Party Victory on Public Federal Bank Credit (2005-2008)

Dependent Variable:	log(total credit)			
	(1) Linear	(2) Quadratic	(3) Cubic	(4) Quartic
Aligned City	0.057	0.110*	0.174**	0.205**
	(0.045)	(0.057)	(0.074)	(0.089)
Observations	4,536	4,536	4,536	4,536
R-squared	0.812	0.813	0.813	0.813
State FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
log(total $cred_{2004}$)	YES	YES	YES	YES

Notes: Regressions include a polynomial on victory margin described in each column interacted with aligned city dummy. Sample with 1136 municipalities with one allied and one non-allied candidates. Standard errors reported in parentheses are clustered at the municipal level. The unit of observation is the total amount of credit granted from public federal bank in a year for a given city. Data from SCR - Credit Information System.

*** significant at 1% ** significant at 5% * significant at 10%

Table 1.5 - Effect of Political Alignment on Total Credit Distribution Across Cities

Dependent Variable:	Δlog(Total Credit)				
	(1)	(2)	(3)	(4)	(5)
	All Sample	All Sample	State-Owned and Private Banks	State-Owned and Private Banks	State-Owned and Private Banks
Aligned City	0.012**	0.012**	0.013**	0.013**	0.013**
	(0.005)	(0.006)	(0.005)	(0.005)	(0.005)
Presence Public State Bank				-0.066	-0.066
				(0.043)	(0.043)
Presence Under Intervention Bank				-0.016	-0.016
				(0.017)	(0.017)
log(Total Bank Assets$_{t-1}$)	-0.135***	-0.142***	-0.047***	-0.047***	-0.047***
	(0.009)	(0.015)	(0.007)	(0.007)	(0.007)
log(GDP$_{t-1}$)		0.003	-0.049**	-0.048**	-0.048**
		(0.021)	(0.024)	(0.023)	(0.023)
log(POP$_{t-1}$)		0.013	0.202***	0.203***	0.203***
		(0.059)	(0.072)	(0.073)	(0.073)
Prop Agricultural GDP$_{t-1}$		0.170**	0.304***	0.302***	0.302***
		(0.072)	(0.087)	(0.087)	(0.087)
Observations	39,542	26,441	11,643	11,643	11,643
R^2	0.079	0.049	0.068	0.069	0.069
Panel Units	3,733	3,615	1,603	1,603	1,603
City Fixed Effect	YES	YES	YES	YES	YES
Year Fixed Effect	YES	YES	YES	YES	YES

Notes: This table reports the effect of changes in political alignment in a given city over its total lending from all types of banks. Column (1) comprises the period 1997-2008. Other columns are restricted to the period to 2001-2008. Columns (1) and (2) include all cities, while the other includes just those cities with state-owned and private bank branches.Data from Estan - Monthly Banking Statitistics from Central Bank of Brazil. Standard-Errors reported in parentheses are clustered at the municipality level.

*** significant at 1% ** significant at 5% * significant at 10%

Table 1.6 - Effect of Aligned Party Victory by Type of Bank Credit (2005-2008)

Dependent Variable:	log(credit)							
	Non-Directed Credit				Directed Credit			
	(1) Linear	(2) Quadratic	(3) Cubic	(4) Quartic	(5) Linear	(6) Quadratic	(7) Cubic	(8) Quartic
Aligned City	0.134**	0.209***	0.236***	0.274***	0.033	0.043	0.139	0.148
	(0.054)	(0.067)	(0.083)	(0.099)	(0.060)	(0.076)	(0.098)	(0.118)
Observations	4,495	4,495	4,495	4,495	4,471	4,471	4,471	4,471
R-squared	0.752	0.753	0.753	0.753	0.747	0.747	0.748	0.748
State FE	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES
$\log(cred_{2004})$	YES	YES	YES	YES	YES	YES	YES	YES

Notes: Regressions include a polynomial on victory margin described in each column interacted with aligned city dummy. Sample with 1136 municipalities with one allied and one non-allied candidates. Standard errors reported in parentheses are clustered at the municipal level. The unit of observation is the total amount of credit granted in the specified type from a public federal bank in a year for a given city. Data from SCR - Credit Information System

*** significant at 1% ** significant at 5% * significant at 10%

Table 1.7 - Effect of Aligned Party Victory by Type of Borrower (2005-2008)

Dependent Variable:	log(credit)							
	Credit to Firms				Credit to Individuals			
	(1) Linear	(2) Quadratic	(3) Cubic	(4) Quartic	(5) Linear	(6) Quadratic	(7) Cubic	(8) Quartic
Aligned City	0.139*	0.187**	0.258**	0.290**	0.032	0.046	0.088	0.093
	(0.073)	(0.089)	(0.110)	(0.132)	(0.048)	(0.060)	(0.079)	(0.095)
Observations	4,246	4,246	4,246	4,246	4,518	4,518	4,518	4,518
R-squared	0.694	0.695	0.696	0.696	0.810	0.810	0.810	0.810
State FE	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES
$\log(cred_{2004})$	YES	YES	YES	YES	YES	YES	YES	YES

Notes: Regressions include a polynomial on victory margin described in each column interacted with aligned city dummy. Sample with 1136 municipalities with one allied and one non-allied candidates. Standard errors reported in parentheses are clustered at the municipal level. The unit of observation is the total amount of credit granted in the specified type from a public federal bank in a year for a given city. Data from SCR - Credit Information System

*** significant at 1% ** significant at 5% * significant at 10%

Table 1.8 - Robustness Checks on the Effect of Political Alignment

Dependent Variable:	Δlog(Total Credit)			
	(1) 1997-2008	(2) 1997-2008	(3) 1997-2008	(4) 2001-2008
Aligned City	0.014***	0.012**	0.012**	0.016***
	(0.005)	(0.006)	(0.006)	(0.006)
Presence Public State Bank	0.078***		-0.033	-0.068
	(0.018)		(0.033)	(0.044)
Presence Private Bank	0.016		-0.018	-0.024
	(0.014)		(0.018)	(0.020)
Presence Under Intervention Bank	0.020		-0.086***	-0.098***
	(0.016)		(0.015)	(0.018)
log(Total Bank Assets$_{t-1}$)	-0.127***	-0.118***	-0.117***	-0.126***
	(0.011)	(0.015)	(0.015)	(0.018)
log(GDP$_{t-1}$)		-0.047**	-0.047**	-0.052**
		(0.020)	(0.020)	(0.022)
log(POP$_{t-1}$)		0.100**	0.098**	0.249***
		(0.047)	(0.047)	(0.056)
Prop Agricultural GDP$_{t-1}$		0.230***	0.224***	0.248***
		(0.061)	(0.061)	(0.067)
Observations	27,677	21,105	21,105	18,969
R^2	0.134	0.118	0.119	0.135
Panel Units	2,696	2,642	2,642	2,641
City Fixed Effect	YES	YES	YES	YES
Year Fixed Effect	YES	YES	YES	YES
States Trend	YES	YES	YES	YES
Governor Mandate Fixed Effect	YES	YES	YES	YES

Standard-Errors reported in parentheses are clustered at the municipality level

*** significant at 1% ** significant at 5% * significant at 10%