

Political Power Persistence and Economic Development: Evidence from Brazil's Regime Transition*

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Abstract

Democratic societies today fare better than authoritarian regimes by almost any standard of economic development. Democratization, however, does not guarantee improvements in human well being. While elections allow citizens to select their leaders and hold them accountable, inefficient policies can also emerge when elites capture the democratic process. This paper constructs a measure of political power concentration and persistence of power for 900 municipalities in Brazil from 1947 to 2000. We use this data to examine the effects political concentration and persistence of power after Brazil's transition to democracy in the mid 1980s. We find that municipalities where political power has been historically concentrated have lower levels of current development. Moreover, we find that persistence of power is associated with lower development indicators, even for the same levels of previous political concentration.

Key words: elites, regime transition, economic development.

JEL: D72, D78.

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1 Introduction (incomplete)

There is a growing consensus among scholars that differences in economic institutions and divergences in political development affect long-run economic development. While recent empirical literature has provided evidence on the long-run effects of institutions, we still know little about the mechanisms that relate political to economic development. (See Acemoglu, Johnson, and Robinson (2001) and Naritomi, Soares, and Assuncao (2007) for the case of Brazil.) Moreover, recent work has emphasized that persistence of elites and political power, even when countries democratize, can be responsible for significant differences in policies adopted by governments and, consequently, in long-term economic development.¹

This paper builds a new dataset on the persistence of local elites in Brazil's local governments from 1947 to 2000. We match families using the surname of the mayor in power in every period. Because the military dictatorship in Brazil that starts in 1964 and ends in 1985 held local elections, we can build measures of political power concentration across political regimes and the share of families that persist in power after democratization.

This paper provides new evidence on the persistence of political elites through time using a new assembled historical data from approximately 900 municipalities in Brazil. We show, using measures of political concentration and persistence of political power, that municipalities where a larger share of families persist in power through time are less developed today. Citizens are poorer, less educated, and have access to less public goods.

2 Historical Background

Between 1964 and 1985, Brazil was governed by a military dictatorship. The *Coup D'etat* that brought the military to power had its origins on the ongoing institutional crisis that begun in 1961 when president Jânio Quadros resigned and the vice-president João Goulart took office. He was perceived by the elite as a threat to their economic and political interests because of his support for populist policies to improve the economic conditions of lower income households (O'Donnell (1967))

¹See Acemoglu and Robinson (2008) and Besley, Persson, and Sturm (2005)

² Top members of the military thought about blocking Goulart from assuming the presidency, but in the end they were discouraged by the threat of an internal civil war. The military allowed Goulart to take office because they thought that “honoring the constitution was the only way to strengthen Brazil’s democracy” (Skidmore (1988)). Nonetheless, Goulart took office with reduced powers under a semi-parliamentary system that gave complete veto power to the right-wing dominated congress. As Goulart turned left on his internal and external policy, the found the rest of the left fragmented. An increasing tension grew until by the end of March 1964 a *Coup D’Etat* led by a military-civilian conspiracy led by Castelo Branco took power.

The military dictatorship did not aim at establishing a rent-seeking autocratic regime. Instead, Brazil’s military objective, similar to other “modernizing” military regimes in Argentina and Chile, was to stop the access of populist and socialist politicians to power, stabilizing the political arena, and fostering modernization and economic growth (Stepan (1973)). In order to do so, military leaders believed that political power had to be controlled until the political instability and the potential for populist politicians to attain power was limited (Skidmore (1988)). Thus, once the military expelled the populist coalition from power with the 1964 Coup, instead of restoring power to Goulart civilian rivals, it excluded them from power. Political control was put in the hands of qualified members of the military and technocrats with no political credentials and relationship to traditional political groups (i.e. economists, engineers).³ Power was to be hold by the military as an institution, and not by individuals, with constant turnover of presidents.⁴ Moreover, Brazil was the only country among the bureaucratic authoritarian regimes in Latin America where the congress was kept open and elections took place during the dictatorship. According to military top figures, this was needed in order to re-establish democracy after the military had stabilized the system (Rego (2008)).⁵ Elections also took place throughout the whole regime and municipalities

²João Goulart had been a minister of labor under president Juscelino Kubitchek administration from 1955 to 1960 and promoted increases in the minimum wage as an effective redistributive policy.

³See Hagopian (1996).

⁴In fact, civil politicians served as vice-presidents in three out of the five generals that served as presidents between during the regime, see Rego (2008).

⁵An alternative explanation, however, rests on the need to balance the power of old and new elites. The need to give the rural elite voice compared to the new emergent industrial elites that were more closely linked to the new modernization project.

elected their mayors and the local council.⁶

In the early stages of the regime, the military implemented a modernizing and progressive agenda. They defied the existing oligarchies by promoting economic and social reforms and fighting corruption and clientelistic practices (Huntington (1968)). They significantly reduced the resources available to local political elites for patronage by reforming the tax and intergovernmental system in order to concentrate power in the center administration and weaken the governors. A fiscal reform was implemented and resources to states and municipalities were to be distributed based on economic and population criteria, reducing the possibility for discretion and pork-barrel politics (Hagopian (1996)).

The adoption of policies that fostered industrialization and modernization helped Brazil to achieve spectacular economic growth rates. From 1968 to 1974 Brazil grew average of 10 percent annually, while industrial output was growing at even faster rates (12.6 percent annually). Emphasis was put in increasing access to credit for durable goods, reducing labor costs and fomenting industrialization through tax incentives, specially, by moving industrial plants to poor regions such as the Northeast.

The Brazilian economic miracle suffered a sudden stop with the 1973 oil shock. With the new economic scenario with recession and inflation, it became harder to obtain political support from the median voter. There was a widespread perception that the military needed to legitimize the regime using the political arena through elections. In the 1974 election, to everyone's surprise, the government decided to allow all candidates to have access to TV and radio campaign (Skidmore (1988)). The MDB adopted a strategy of focusing on daily issues rather than criticizing the regime. The result was a massive victory by the opposition— the MDB gained 78 deputies and 13 senators across Brazil. In the states, the MDB also took of the most important state legislatures such as Rio de Janeiro and São Paulo. These results were unexpected. The president Geisel was starting a process of gradual transition to a semi-democratic regime, but in order to do so and still maintain the power, he needed a strong party to gather votes and support the regime.

Several analysts argue that in the mid-1970s the military regime brought the local traditional

⁶The exception were municipalities considered national security where the mayor was appointed.

elites back into power by re-introducing the practices of pork-barrel, patronage and clientelism.⁷ This process is well described by Hagopian (1996):

“At a time when public sector expansion transformed clientelism and agricultural modernization, mass urbanization, and capital-intensive industrialization caused an explosion in the number of clients dependent on the state, increasing the amount of resources earmarked for pork-barrel was all the more possible and potentially effective...politically effective distribution of state resources held the key to success at the polls.”

The transfers made to states through pork-barrel were more effective the larger the power the government could buy. Despite having larger support in the poorest regions (North and Northeast), the number of deputies from these regions were not enough to guarantee a majority for the military government. Once again, in a strategy to guarantee the continuation of their power, the military introduces a new electoral reform before the 1978 election. Among the two most important features were the fact that the number of deputies by state would be proportion to population and not electorate. Since illiterate citizens could not vote and the poorest states had a larger share of illiterate population, this reform increased the number of deputies that could be elected in the North and Northeast states, increasing also the amount of pork-barrel spending distributed to those regions helping local elites to stay in power with the democratic transition of the early 1980s.

3 The Data

3.1 Political Concentration

To measure political concentration within a municipality, we collect data on mayor names from the electoral commissions of three states in Brazil: Alagoas, Ceara, and Minas Gerais.⁸ For Minas Gerais and Ceara, we have a list of all the mayors who held office from 1947 to 2000, whereas in Alagoas, the list of mayors dates back to 1960. Given these periods, there has been an average of 12 elections in Minas Gerais, but only 10 elections in Alagoas (see Table 1). In Ceara, there

⁷See for example Nunes (1978).

⁸We selected these states based on data availability.

has been an average of 11 elections, but only 55 percent have had a different family assume power (see below for how we construct this information). With the exception of Minas Gerais, where 64 percent of the elections elected a mayor from a different family, the percentages across the other states are similar. The remaining rows of Table 1 compare the states along other socioeconomic characteristics. In general, Minas Gerais is much larger with 710 municipalities and a population of 18 million inhabitants. Minas Gerais' per capita income of R\$276.56 is much higher than that of Ceara's R\$156.24, the second highest in our sample, and its poverty rate is less than 30 percent, compared to 60 percent for Alagoas. Because of these differences across states, our main specifications will use state-fixed effects to rely on within state variation. Moreover, our analysis will mostly focus on Minas Gerais and Ceara, given that the data on Alagoas cover a shorter time period.

Constructing Family Links

To construct our measure of political concentration within a municipality, we assume that mayors belong to the same family if they share at least one common surname. In Brazil, it is common for individuals to have at least two surnames. The first surname is typically the mother's family name, while the second is the father's family name. Table 2 provides a few examples of how we use this information to construct these family links. Our first example comes from the municipality of Barreiras do Piaui. In this municipality, a member of the Barreira family has been in office since 1970. For our analysis, we code this municipality as having one political family in office throughout its history. The municipality of the municipality Marco of Ceara offers another example of a "local dictatorship", albeit a less stark one. In this case, a member of the Osterno family had been in office for 9 out of the 10 elections dating back to 1958. However, in the 1972 administration in which a Neves was in office, members of the Osterno and Neves family had at some point married. A less extreme example is given by the municipality Itaverava in Minas Gerais. Here we see that 4 families (Coelho, Carvalho - who at some point married a Leao, and Silva) have alternated power from 1963 to 2000.

Figure 2 displays the share of elections that a family is in power for our sample of municipalities

with at least 2 elections prior to the dictatorship in 1964.⁹ At least 76 percent of families have been in power only once, whereas 10 percent of families have been in power for at least 30 percent of the elections. In Figure 3, we plot the proportion of municipalities that elected a mayor from a family that had been in office previously. From 1950's to 1970's, mayors from previous political families were elected in approximately 20 percent of municipalities. After the 1972 elections, the percentage of municipalities jumps up to 50 percent, and remains there until 1996. There is another spike in 2000, where almost 75 percent of municipalities elected a mayor from a previous political family, but this is likely to reflect the fact that in 1997 mayors became eligible for re-election. For an interesting point of contrast, Dal Bó, Dal Bó, and Snyder (2009) compute the proportion of legislators in the U.S. Congress with previous relatives who held office. For the U.S. the proportion of legislators with previous family members is only around 15 percent during the 1850's and declines steadily over time.

We explore the ability of political families to remain in power over time more closely in Table 3. We construct a measure of power persistence by calculating the share of families in power during period t that remain in power after the regime transition in $t + 1$. In order to illustrate this measure, suppose four families held a mayoral office during the dictatorship period. Out of these four families, two of them were elected for the mayoral office after the democratization. The value of power persistence from the dictatorship to the democratic period for this municipality would equal 0.5. Of the families that were in power prior to the dictatorship, 11.2 percent regained power at some point during the dictatorship. Similarly, 16.3 percent of political families were able to transition from dictatorship to democratization. While approximately 4 percent of families were in power during all three periods (i.e. pre-dictatorship, dictatorship, democratization), the average number of periods a family was in power is 1.3. Computing these transitions at the municipal-level, we find that on average 35 percent of families within a municipality retained power during the regime change to a dictatorship, whereas on average 31 percent of families within a municipality succeeded after the end of the dictatorship.

For the purpose of our econometric analysis, we construct a Herfindahl index of political con-

⁹By restricting the sample in this manner, we cannot use data from the state of Piauí because it is only available starting in 1970.

centration to measure a municipality’s level of political inequality. Specifically, our measure of political concentration, H_{mt} , for municipality, m , during period t is computed as:

$$H_{mt} = \sum_i \left(\frac{\text{Number of elections family } i \text{ has been in power}_{imt}}{\text{Total number of elections}_{mt}} \right)^2$$

Larger values of the index correspond to higher concentration of political power in the municipality. We also present a normalized version of the index $H_{mt}^* = \frac{H_{mt} - 1/N_f}{1 - 1/N_f}$, where N_f is the number of political families in the municipality in a given period. The normalized index has the advantage of being bounded between $(0, 1)$. In addition to the Herfindahl index, we also compute a political concentration measure based on Acemoglu et al. (2008):

$$P_{mt} = - \frac{\text{Number different families in power}_{mt}}{\text{Number of elections}_{mt}}$$

where the negative sign is used such that the index, similarly to the Herfindahl, increases as political power becomes more concentrated.

Table 4 presents summary statistics for our measure of political concentration. In column 1, we compute the measure for period 1947-2000, whereas columns 2-4 displays the measure for the three periods separately. Overall, the mean of our measure is 0.22. This corresponds to in effect 4.3 political families on average during the entire period. An interesting pattern emerges when the measure is computed over the three periods separately. Political concentration, at the local level, actually decreases during the dictatorship, and increases again during democratization. During the pre and post-dictatorship, political concentration was around 0.42, but only 0.33 during the dictatorship.

3.2 Additional data

To study the long-term impacts of political concentration, we assemble an extraordinary database spanning the period from 1947 to 2000. Here we describe the data used in the analysis. More detail on these data sources and the variables used is presented in the data appendix. The principal outcome variables come from Brazil’s 2000 population census, which are aggregated to the level

of the municipality. These variables include average income per capita, infant mortality per 1000 births, average education level of the adult population, share of households with running water, and share of households with electricity. To get a measure of economic activity in the municipality, we merge these data with industrial and agricultural censuses of 1995. From these data, we compute the share of employment related to industry and agriculture. Our final set of outcome variables are created from data obtained from Brazil's electoral commission. With these electronic files, we compute standard measures of political competition, such as: effective number of political parties that ran for mayor and the size of the legislative council.

In the analysis, it is important to account for Brazil's vast regional differences in economic development. From Brazil's federal statistical bureau (Instituto Brasileiro de Geografia e Estatística(IBGE)), we collect various geographical attributes of the municipality: latitude, longitude, size of the municipality, and distances to capital cities.

Table 5 shows descriptive statistics for the main variables used in our analysis. Column 1 presents the mean characteristics for the entire sample, whereas columns 2 and 3 distinguishes between municipalities in top and bottom 25 percent of the distribution of our index of political concentration. As displayed in the Table, municipalities with low levels of political concentration fare much better than those municipalities characterized by high levels of political concentration across any measure of well-being. For instance, infant mortality is 5 deaths per 1000 births lower in municipalities with low political concentration. In these areas, life expectancy and per capita income are also much higher. Public good provision as measure by the share of households with electricity and running water is also much higher in politically competitive municipalities. Our measure of political concentration also correlates strongly with the more standard measure of political competition. Compare to higher concentration areas, the effective number of political parties that ran for mayor is almost 2 parties higher in municipalities with low political concentration.

4 Results

4.1 Political Concentration and Long-Term Development

We begin our analysis by documenting the relationship between historical political concentration and long-term economic and human development outcomes measured around 2000. As described in the data section, we measure Political Concentration using the Herfindhal index, calculated as the share of terms each family was in power between 1947 and 1982.¹⁰ Figure 4 shows the relationship between indicators of development and historical political concentration using a non-parametric local regression. The figures show that as political power becomes more concentrated (larger values of the Herfindhal index), municipalities are currently less industrialized and poorer. Moreover, political concentration is associated with less years of schooling and more infant mortality.

Clearly these correlations might just reflect differences in geography (municipalities in Brazil's northeast have always been poorer compared to municipalities located in the South). In order to control for these initial differences, we estimate cross-section regressions that take the form:

$$y_{ij} = \beta_0 + \beta_1 \text{Polconcentration}_{ij} + X'_{ij} \theta + \nu_j + \varepsilon_{ij} \quad (1)$$

where i indexes a municipality and j a state, the vector X'_{ij} includes geographical characteristics such as latitude, longitude, altitude, distance to the federal capital and the area of the municipality and ν_j is a state fixed-effect. In addition to this basic specification, we also run a second specification for each dependent variable where we control for the initial level of the dependent variable in 1970.¹¹ This allow us to control, in part, for reverse causation due to the fact that municipalities with large political concentration might have had poor development indicators to begin with.

The results from these specifications are shown in Table 6. In all three panels the odd numbered columns present the first specification while the even numbered columns include as control the value of the dependent variable in 1970. Panel A presents the results for the relationship between political

¹⁰Using the alternative measure of minus the share of times a family was in power used by Acemoglu et al. (2008) provides similar results.

¹¹Unfortunately, this is the earliest census data that we currently have. In the next version of the paper, these regressions will control for pre-period characteristics using the 1940 census. Moreover, for some variables, earlier measures of the variables are not available.

concentration from 1947 to 1982 and measures of economic development in 2000. Municipalities where power has been historically concentrated in the hands of fewer families have lower income per capita and are less industrialized. These associations are robust to controlling for initial levels of development in 1970 (columns 2 and 4). The magnitude of the coefficients imply that an increase in one standard deviation in the political concentration index (0.1) is associated with 3 to 6 percent lower income per capita and 7 to 10 percent less industrial plants per capita.

Clientelism in Brazil's municipalities have traditionally been practiced by local political bosses using public employment as a way to appeal to the electorate. Although we do not have information on the number of municipal public employees from the 1970s, we examine how political concentration is related to present day public employment, controlling for initial per capita income in 1970. The point estimate in column 5 suggests that an increase in one standard deviation in the historical Herfindhal Index is associated with 7 percent increase in current public employment per capita.

Panel B shows the association between historical political concentration and measures of human development. An increase political concentration index is associated with less years of schooling, lower life expectancy and higher infant mortality. The effects vary from 2 to 7 percent, comparing the change in one standard deviation to the means of the respective variables. Finally, in Panel C we show that municipalities where less families controlled politics over a 35 year period are places where current population have less access to sanitation and electricity. As expected, these are also locations with lower political competition today (as measured by the effective number of parties in the local legislature).

The previous results show a negative association between political power concentration and economic development. Despite these results being robust to controlling for initial levels of development, political concentration might be correlated with other economic factors that have been shown to reduce long-run development such as the concentration of land in the hands of few owners (eg. Engerman and Sokoloff (2002)). Despite some recent evidence that land inequality is indeed correlated with inferior long-run development outcomes, in a recent paper, Acemoglu et al. (2008) argue that the effect of land inequality depends on the collective action of the rural elite and might

be positively correlated with long-term development outcomes. In order to compare our results with the case of Colombia, we re-estimate equation 1 including as an additional regressor a measure of land inequality in 1975. This allows us to compare the results with Acemoglu et al. (2008) and discuss the contribution of political and economic inequality to long-run development.

In all specifications, political concentration remains a significant determinant of long-run development. In addition, the coefficient on land inequality is statistically significant in most specifications. Higher land inequality in 1975 is associated with better economic and human development outcomes in 2000. An increase in one standard deviation in the land Gini (0.12) is associated with 7 percent more industrial plants per capita. It is also associated with more years of schooling and larger share of households with electricity (Panel B). In Panel C, we show that higher levels of land inequality in 1975 are associated with longer life expectancy and lower infant mortality. Finally, higher land inequality is associated with more political competition and lower levels of public employment. Overall, these results are consistent with Acemoglu et al. (2008), although the relationship examined here is over a much shorter period of time (25 years).

4.2 Political Persistence, Regime Transition and Long-Term Development

In the previous section we showed that long-run economic development is negatively associated with historical political concentration of power. There are several explanations for these correlations. Factor endowments that favored large plantations and concentrated ownership of land in the hands of few owners can affect incentives for productive activities.¹² We now focus on the role of political power persistence across regimes' changes. We first show that political concentration predicts the persistence of the same families in power over time, even after democratization. We then show how long-run development outcomes relate to political power persistence, controlling for levels of power concentration.

¹²See Naritomi, Soares, and Assuncao (2007) for an analysis of the long-term effects of extractive economic activities in Brazil.

Power Concentration and Political Persistence

We examine the association between the concentration of power during the dictatorship period and the persistence of political power after the regime transition. In Figure 5 we show this association. Municipalities that have had larger political concentration are more likely to have a larger share of families persisting in power after the democratic transition.

In order to examine if this relationship is robust to geographic controls and initial economic characteristics, we regress our measure of political persistence on an index of political concentration between 1964 and 1985, controlling for geographical characteristics:

$$\text{Persistence}_{ij} = \beta_0 + \beta_1 \text{Polconcentration}_{ij} + X'_{ij} \theta + \nu_j + \varepsilon_{ij} \quad (2)$$

where *Persistence* is the share of families in power during the dictatorship period that are also in power during the democratic period (after 1985) in municipality *i* and state *j*, the vector X'_{ij} includes the geographical characteristics and the level of the dependent variable in 1970, and ν_j is a state fixed-effect. *Polconcentration* is measured as the Herfindhal using the share of time a family was in power or alternatively by the share of families that had a member as a mayor during the dictatorship.

The results are shown in Table 8. Column (1) shows the association between political concentration during the dictatorship and the persistence of power. An increase in one standard deviation in the political concentration index (0.11) is associated with an increase in the share of families that persist after the regime transition of 0.32. Comparing to the mean share of families that persist (0.23), this corresponds to a 14 percent increase in persistence. In column (2) we control for demographic characteristics of municipalities in the transition period (1980) and include measures of income and land inequality. Municipalities with higher levels of income (and not land) inequality have a larger proportion of ruling families persisting after the transition (coefficient -0.104 with standard error 0.054). In columns (3) and (4) we report the same specifications using an alternative measure of Political Concentration— the share of families that hold local power during the dictatorship, adjusted to increase as the share of families decrease. The results provide a simi-

lar perspective suggesting that higher political concentration during the dictatorship is associated with more political persistence. The magnitude of the coefficient in column (3) suggest that a one standard deviation increase in the share of families that hold power increase persistence by 13 percent.

These results together suggest that in municipalities where political power was concentrated in the hands of fewer families, there was more persistence of power after the democratic transition. This effect might be related, however, to the ability of local elites to adapt to different contexts and make the alliances and investments necessary to maintain their power positions. Thus, it might be possible that elites that are likely to persist into the regime change from the dictatorship to democracy are the same elites that were able to maintain their power in the transition from pre-dictatorial regime to dictatorship after the military coup. In order to investigate that we calculate the index of political concentration and the share of families that persist in local power from the pre-dictatorial period (1947-1964) into dictatorship. Although we have significantly less observations (498 municipalities) because we only use those municipalities where we have at least three elections prior to 1964, we re-run regression (2) including controls for pre-dictatorship political concentration and power persistence. These results are shown in columns (5) and (6). The results suggest that higher levels of political concentration during the dictatorship is associated with a larger share of families that persist in power after the regime change (coefficient 0.181, standard error 0.090). The index of pre-dictatorship political concentration, however, also shows a positive and significant effect to explain political persistence (coefficient 0.118, standard error 0.051). Moreover, even after controlling for political concentration during the whole 1947-1985 period, the share of families that persist in power after the 1964 military coup is positively and significantly associated with larger share of families that persist after the democratization. Namely, a one standard deviation increase in the share of families that persist into the military period is associated with 12 percent larger share of families that persist after the democratic transition.

State Resources and Regime Transition

The military government started to liberalize the regime in xxxx. But the 1974 elections brought a huge loss to their plans to maintain power using controlled elections. The economic growth strategy adopted by the military regime, based on large scale public sector expansion, led itself to an “explosion in the number of clients dependent on the state, increasing the amount of resources earmarked for pork-barrel spending” (Hagopian, pp. 141). What is the role played by the military government in the transition? Hagopian argues that....Ames argue that ..

Although we do not have information on the transfers made by the central government to municipalities, we do have data on transfers made to states. In general, after 1976, the central government significantly increased the transfers to the states in the Northeast where the military party– the ARENA- enjoyed a larger support. Several authors claim that this change in the pattern of transfers was aimed at guaranteeing a victory in the 1978 deputy and senator elections (Ames). In Figure 6 we depict two figures that illustrate this possibility. Figure 6, panel A, shows the trend of transfers to the states of Alagoas and Santa Catarina (located in the Northeast and south respectively) while panel B shows the trends for Maranhão and São Paulo (in the Northeast and south-east respectively). Transfers to all these states followed a similar trend until 1977 when the states in the Northeast receive significantly more resources until the years of transition that start with the 1982 elections.

In order to examine whether these transfers affected the transition, we use the 1976 and 1982 municipal election data for all states (approximately 3134 observations) and run the following regression:

$$\Delta \text{voteshare}_{ij} = \beta_0 + \beta_1 \Delta \text{Transfers}_j + \Delta X'_{ij} \theta + \Delta \varepsilon_{ij} \quad (3)$$

where Δ calculates the change from 1976 to 1982 and the change for the covariates $\Delta X'_{ij}$ are calculated over the two census data 1970 and 1980. Because our measure of vote share is at the municipal level and the measure of transfers is at the state level, we cluster the standard errors at the level of the state. We are interested in testing whether the coefficient β_1 is positive and significant.

The results from this regression are shown in Table 9. Column (1) shows the unconditional relationship between the change in transfers per capita and the change vote share for the military party, while Column (2) controls for changes in demographic characteristics. Because the equation is estimated as a first-difference, we are controlling for all fixed municipal characteristics that are potentially correlated with transfers and voting patterns (i.e. geographic factors). Both specifications show a positive and statistically significant association between transfers per capita and vote shares. The results are consistent with the military influencing the transition by supporting “conservative politicians” and the traditional elites in the North-east. Thus, a share of the families that persisted in power after the democratic transition might have been helped by the resources made available for patronage and clientelism provided by the military regime in the end of its days (Ames, Hagopian). In the next section, we examine whether this persistence had effects on local economic development.

Political Persistence and Long-Term Development

In the previous sections we showed that there is a negative association between political concentration prior to the 1985 democratization and the level of economic development in 2000. We have also showed that political power persisted after the end of the dictatorial regime in many municipalities. Here we investigate if the persistence of political power across regimes affect long-term development outcomes. In order to investigate this, we estimate the following regression:

$$y_{ij} = \beta_0 + \beta_1 \text{Persistence}_{ij} + X'_{ij} \theta + \nu_j + \varepsilon_{ij} \quad (4)$$

where *Persistence* is the share of families in power during the dictatorship period that are also in power during the democratic period (after 1985) in municipality i and state j , the vector X'_{ij} includes the geographical characteristics and the level of the dependent variable in 1970, and ν_j is a state fixed-effect.

In order to distinguish between the effects of political persistence through institutions and its direct effects through the lack of political competition, we also estimate a second specification where we include as an additional regressor in equation (4) the index of political concentration during

the democratic period. We expect that the lack of competition during the democratic period is associated with lower levels of development, and the coefficient on persistence will pick up the additional effects induced by political persistence that are directly associated with lower economic development.

The results are shown in Table 10. An increase in the percentage of families that stay in power after the end of the dictatorial regime is associated with lower levels of income per capita and more public employees per capita (Panel A, columns 1 and 5). An increase in one standard deviation in the share of families that persist in power is associated with a reduction of 2 percent in income per capita and an increase in 6 percent in per capita public employment. A higher share of families that persist in power after democratization is also associated with less schooling (Panel B, column 1), less households with sanitation and less political competition (Panel C, columns 1 and 5).

In the next set of specifications we control for the level of political competition during the democratic period as measured by the political concentration index using the 1988-2000 period. These results are shown in the even numbered columns in Table 10. The coefficients estimated for persistence remain stable after controlling for present political concentration suggesting that persistence of political elites is associated with lower economic development, even for given levels of political competition. The negative association between low political competition and economic development has been documented by Besley, Persson, and Sturm (2005). They find that the lack of political competition in some U.S. states is associated with lower economic growth, higher taxes, lower capital spending. We complement their finds by showing that persistence of political dynasties can have a detrimental effect on economic development even for given levels of political competition.

5 Concluding Remarks (to come)

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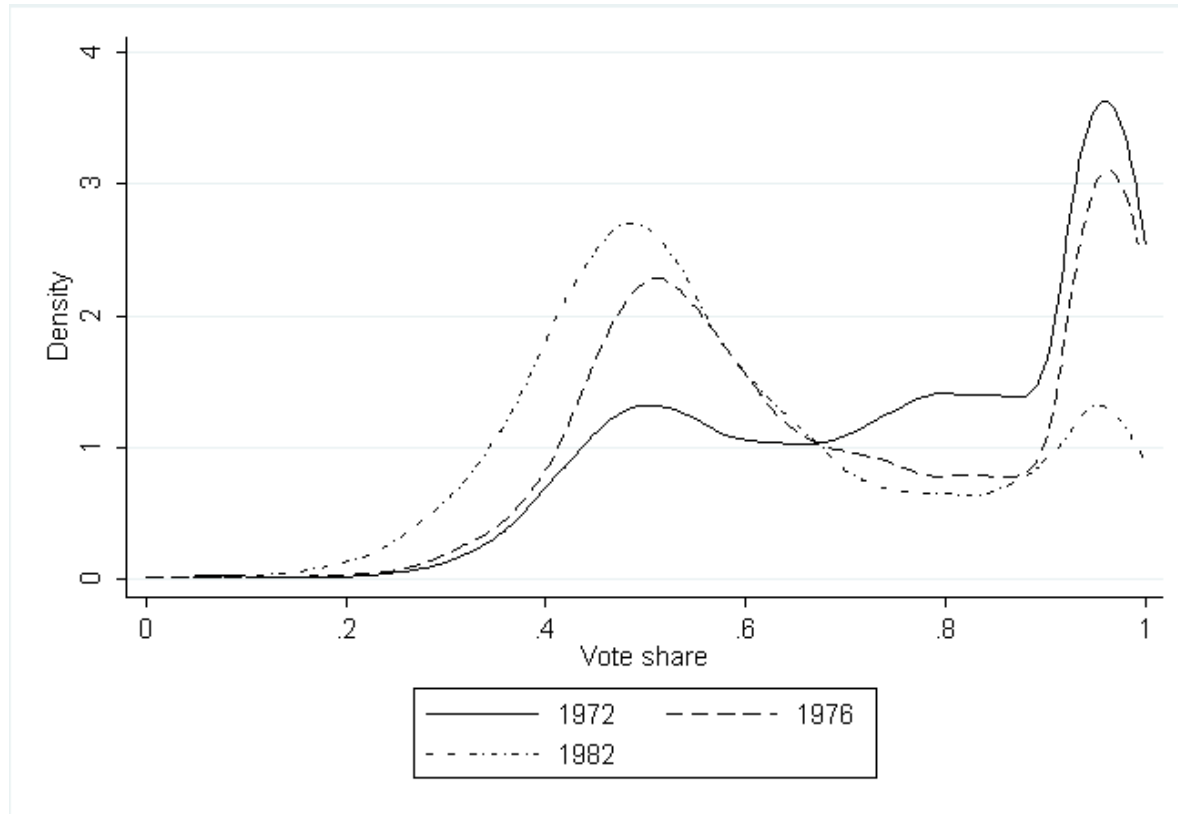


FIGURE 1: DISTRIBUTION OF VOTE SHARE IN MUNICIPAL ELECTIONS FOR THE DICTATORIAL REGIME PARTY

Notes: Figure shows the Kernel densities of the share of votes for the dictatorial regime party in the municipal elections of 1972, 1976 and 1982.

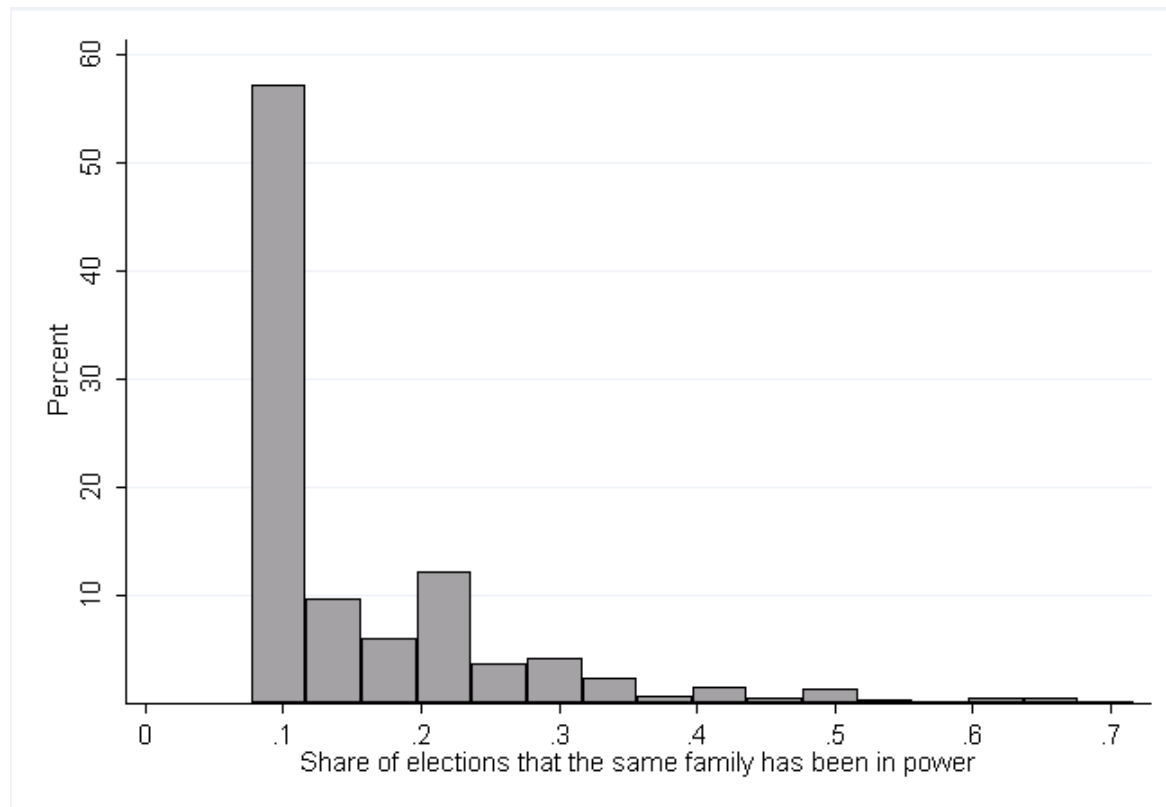


FIGURE 2: DISTRIBUTION OF PERCENTAGE OF TERMS A FAMILY HAS BEEN IN POWER

Notes: The sample consists of all 4,622 families that held power in a municipality that had at least two elections prior to Brazil's dictatorship in 1964.

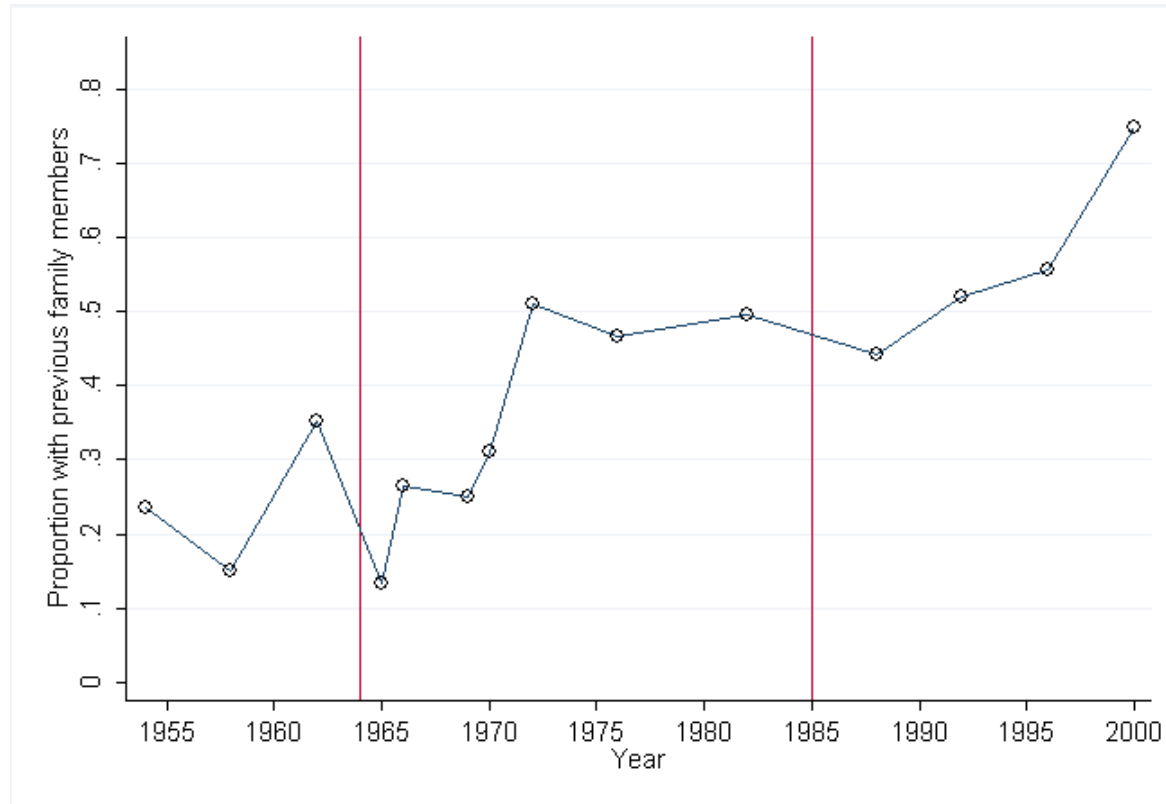


FIGURE 2: PROPORTION OF MUNICIPALITIES WITH AN ELECTED MAYOR WHO WAS FROM A FAMILY THAT HAD BEEN IN POWER PREVIOUSLY

Notes: The sample consists of the 646 municipalities that had at least two elections prior to Brazil's dictatorship in 1964. The vertical lines denote the start and end of Brazil's dictatorship period (1964-1985).

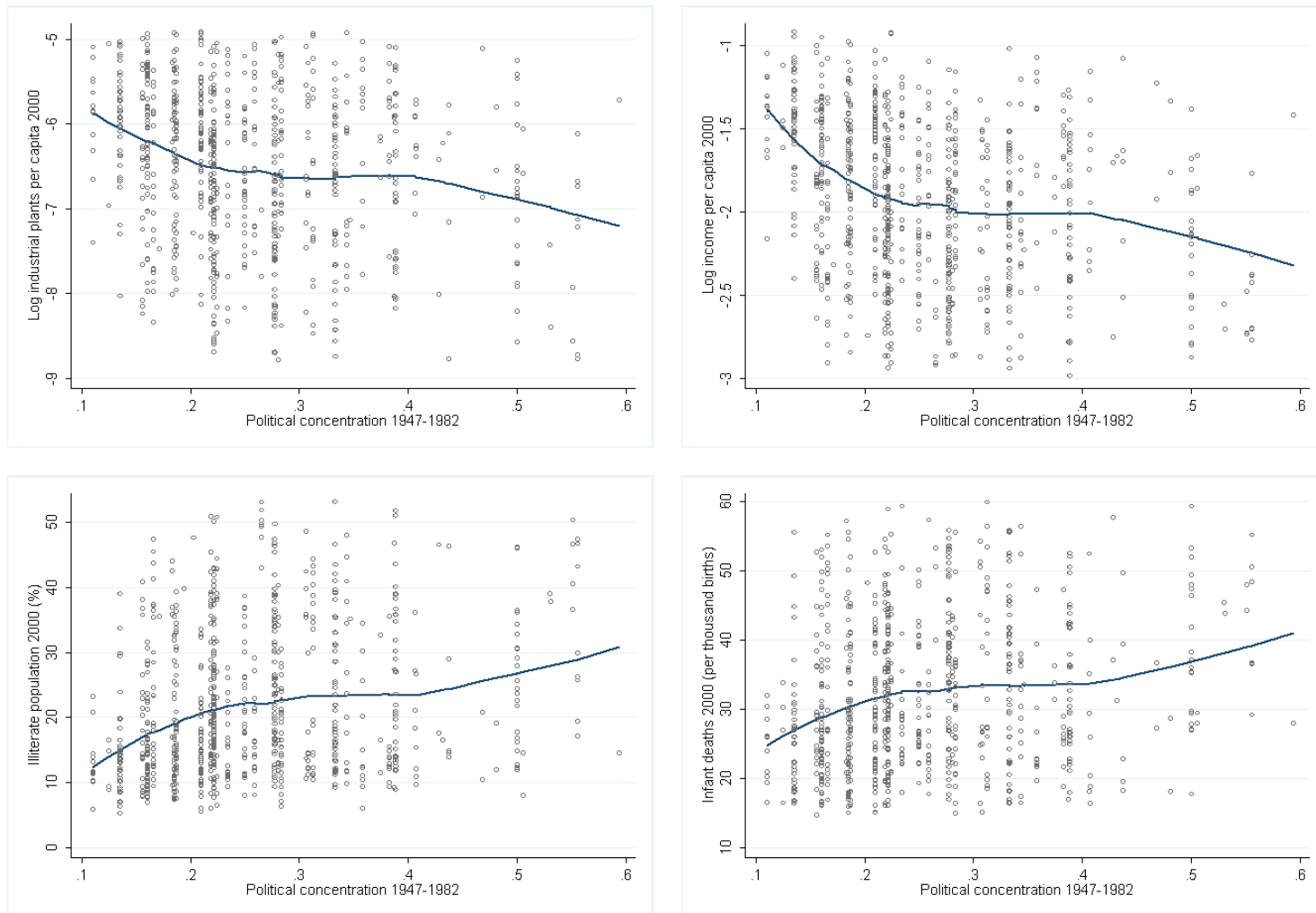


FIGURE 4: POLITICAL CONCENTRATION AND LONG-TERM DEVELOPMENT OUTCOMES

Notes: Figures show the scatter plot of four development indicators in 2000 against the Herfindhal index of Political Concentration measured from 1947 to 1982. Each figure includes a non-parametric Lowess regression representing the fitted unadjusted relationship.

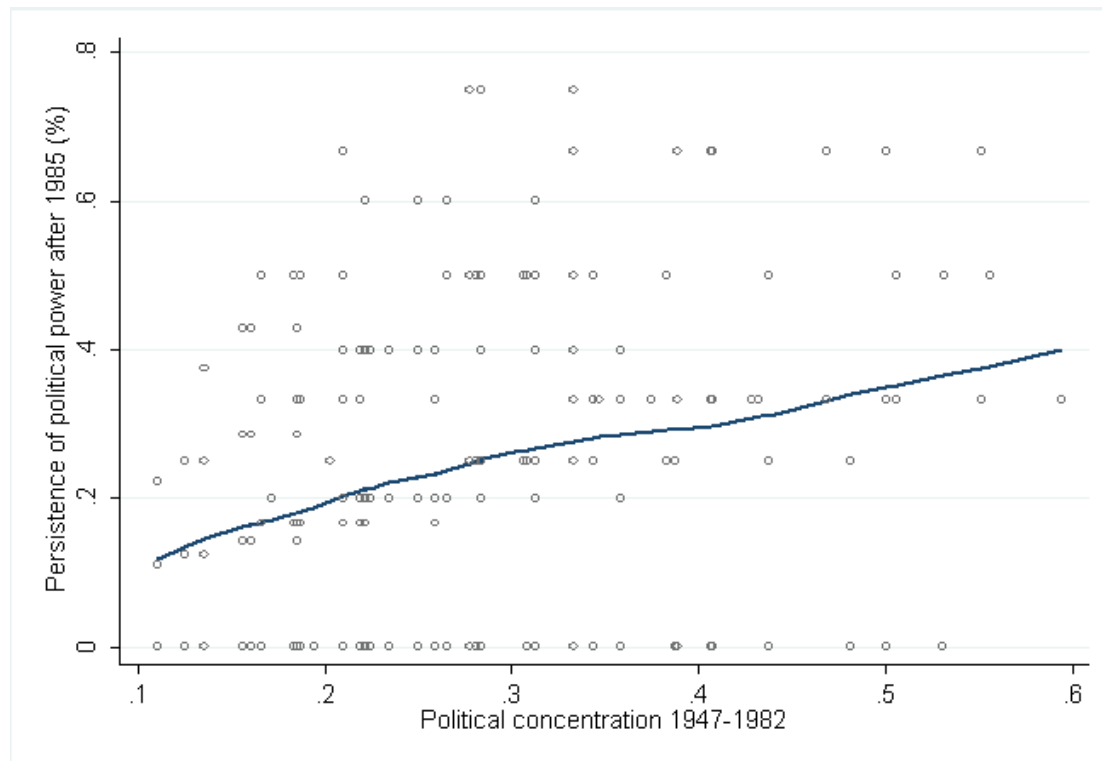


FIGURE 5: POLITICAL CONCENTRATION AND POLITICAL POWER PERSISTENCE

Notes: Figure shows the scatter plot of the share of families that stay in power after the regime transition in 1985 against the Herfindhal index of Political Concentration measured from 1947 to 1982. The figure includes a non-parametric Lowess regression representing the fitted unadjusted relationship.

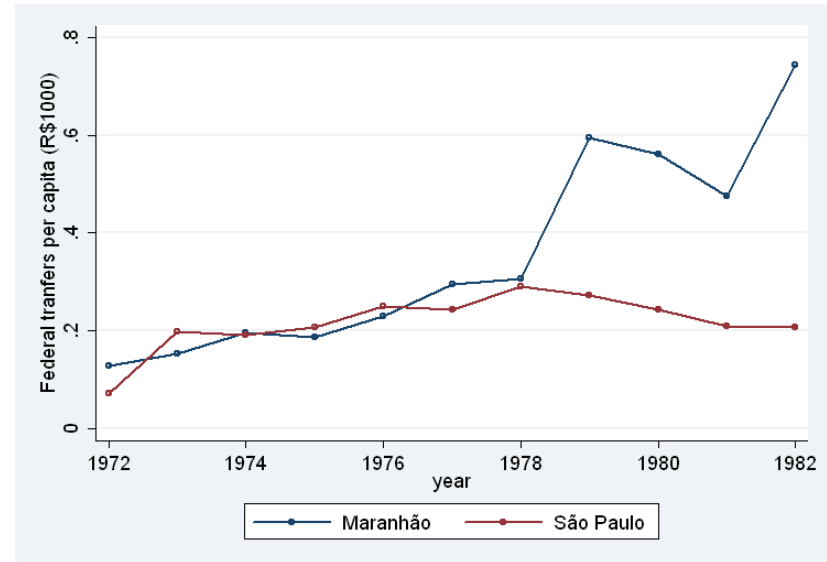
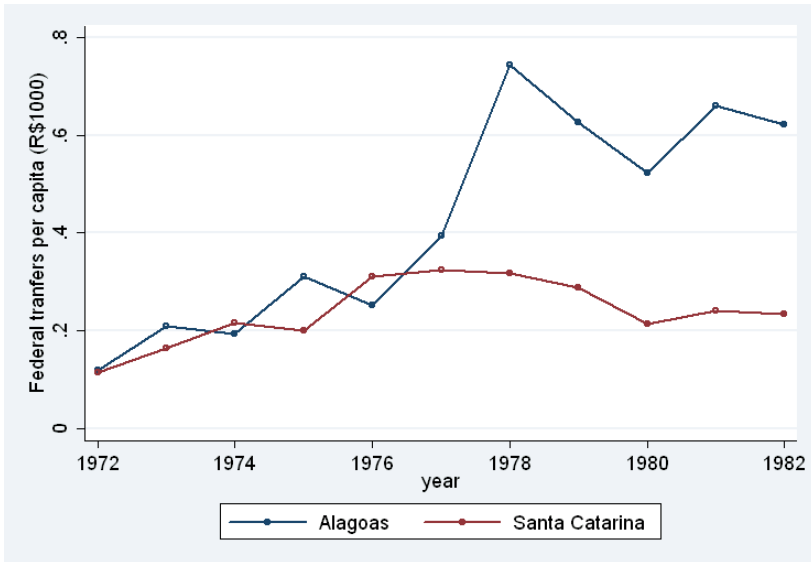


FIGURE 6: COMPARISON OF FEDERAL TRANSFERS PER CAPITA ACROSS NORTH-EAST AND SOUTH-EAST STATES

Notes: Figures show evolution of federal transfers per capita over time for different states. The first figure compares Alagoas with Santa Catarina while the second compares Maranhão and São Paulo

TABLE 1: SUMMARY STATISTICS OF STATES AND MUNICIPALITIES IN THE SAMPLE

	Alagoas	Ceará	Minas Gerais
Years of available data	1960-2000	1947-2000	1947-2000
Number of municipalities	96	152	710
Average number of elections	10.09	11.06	12.08
Average number of mayors from a different family	5.80	6.08	7.67
Socio-economic characteristics (2000)			
Population (millions)	2.8	7.4	17.9
Average years of schooling among adults	4.1	4.4	5.6
Income per capita (R\$) - monthly	139.91	156.24	276.56
Poverty rate (%)	62.24	57	29.77
Gini coefficient	0.61	0.61	0.56

TABLE 2: EXAMPLES OF FAMILY DYNASTIES AND CONSTRUCTION OF FAMILY LINKS

State	Municipality	Year	Given name	First Surname	Second Surname	Third Surname	Complete name	Family Links	
PIAUI	BARREIRAS DO PIAUI	1970	ANCELON	BARREIRA	PARENTE		ANCELON BARREIRA PARENTE	1	
		1972	EULER	BARREIRA	LUSTOSA		EULER BARREIRA LUSTOSA	1	
		1976	HUGO	BARREIRA	DUAILLIBE		HUGO BARREIRA DUAILLIBE	1	
		1982	MANOEL	EDINEY	BARREIRA	SOARES		MANOEL EDINEY BARREIRA SOARES	1
		1988	HANS	BARREIRA	LIRA		HANS BARREIRA E LIRA	1	
		1992	MANOEL	EDINEY	BARREIRA	SOARES		MANOEL EDINEY BARREIRA SOARES	1
		1996	GLENIO	BARREIRA	LIRA		GLENIO BARREIRA E LIRA	1	
		2000	GLENIO	BARREIRA	LIRA		GLENIO BARREIRA E LIRA	1	
CEARÁ	MARCO	1958	JOSE	GERARDO	OSTERNO	RIOS	JOSE GERARDO OSTERNO RIOS	1	
		1966	GERALDO	BASTOS	OSTERNO		GERALDO BASTOS OSTERNO	1	
		1970	GERALDO	MAGELA	NEVES	OSTERNO	GERALDO MAGELA NEVES OSTERNO	1	
		1972	RAIMUNDO	NEIVA	NEVES		RAIMUNDO NEIVA NEVES	1	
		1976	GUY	NEVES	OSTERNO		GUY NEVES OSTERNO	1	
		1982	GERALDO	BASTOS	OSTERNO		GERALDO BASTOS OSTERNO	1	
		1988	FRANCISCO	ROGERIO	OSTERNO	AGUIAR	FRANCISCO ROGERIO OSTERNO AGUIAR	1	
		1992	GERALDO	BASTOS	OSTERNO	JUNIOR	GERALDO BASTOS OSTERNO JUNIOR	1	
		1996	JOSE	WILLIAM	OSTERNO	AGUIAR	JOSE WILLIAM OSTERNO AGUIAR	1	
		2000	JORGE	STENIO	MACEDO	OSTERNO	JORGE STENIO MACEDO OSTERNO	1	
MINAS GERAIS	ITAVERAVA	1963	VALDEMAR	NOGUEIRA	COELHO		VALDEMAR NOGUEIRA COELHO	1	
		1966	ITAMAR	REIS	CARVALHO		ITAMAR DOS REIS CARVALHO	2	
		1970	JOSE	SEVERIANO	SILVA		JOSE SEVERIANO DA SILVA	3	
		1972	ARNALDO	REIS	CARVALHO		ARNALDO REIS CARVALHO	2	
		1976	SEBASTIAO	CARVALHO	LEAO		SEBASTIAO CARVALHO LEAO	2	
		1982	ITAMAR	REIS	CARVALHO		ITAMAR REIS CARVALHO	2	
		1988	DANIEL	SEBASTIAO	BARROS		DANIEL SEBASTIAO DE BARROS	4	
		1992	ANTONIO	LEAO	PEREIRA		ANTONIO LEAO PEREIRA	2	
		1996	GERALDO	LUCIO	CARVALHO		GERALDO LUCIO DE CARVALHO	2	
		2000	ANTONIO	NICOLAU	CARVALHO		ANTONIO NICOLAU DE CARVALHO	2	

TABLE 3: TRANSITION OF POLITICAL POWER ACROSS REGIMES, SUMMARY STATISTICS

	Observations	Mean	SD
Average number of periods a family has been in power	6336	1.290	0.534
Proportion of families that transitioned:			
In all three periods	6336	0.040	0.195
from pre-dictatorship to dictatorship	6336	0.112	0.316
from dictatorship to democratization	6336	0.163	0.370
Average share of families within a municipality that transitioned:			
pre-dictatorship to dictatorship	547	0.345	0.277
dictatorship to democratization	930	0.314	0.233

Notes: The sample consists of those municipalities that had at least two elections prior to Brazil's dictatorship in 1964. The table distinguishes between three periods: pre-dictatorship, dictatorship, and democratization. There are 6336 observations at the level of families and 547 observations at the level of municipalities pre-dictatorship and 930 municipalities in the dictatorship and democratic period.

TABLE 4: SUMMARY STATISTICS OF POLITICAL CONCENTRATION

	Total	Pre-dictatorship	Dictatorship	Democratization
Herfindahl index of political concentration	0.218 (0.100)	0.401 (0.151)	0.330 (0.122)	0.424 (0.152)
Normalized Herfindahl index of political concentration	0.069 (0.069)	0.076 (0.151)	0.066 (0.112)	0.104 (0.170)
Average number of elections	11.441 (1.464)	3.667 (0.472)	4.943 (0.274)	3.987 (0.121)
Number of different families in power	6.698 (1.907)	2.956 (0.788)	3.689 (0.879)	2.859 (0.725)
Number of municipalities	946	547	930	946

Notes: The sample consists of those municipalities that had at least two elections prior to Brazil's dictatorship in 1964. The table distinguishes between three periods: pre-dictatorship, dictatorship, and democratization. The Herfindahl index is computed as the sum across families of the squared share of terms that a family is in power.

TABLE 5: SUMMARY STATISTICS OF MUNICIPAL CHARACTERISTICS

	Overall sample	Low political concentration	High political concentration
Income	4310.803 (12749.620)	4768.242 (10145.240)	2959.782 (7216.801)
Share of urban population	0.613 (0.198)	0.646 (0.190)	0.556 (0.190)
Life expectancy	68.710 (3.788)	69.182 (4.219)	68.012 (3.513)
Infant mortality	34.465 (13.364)	32.784 (14.662)	37.049 (12.680)
Share of households with running water	0.615 (0.191)	0.648 (0.182)	0.564 (0.178)
Share of households with electricity	0.892 (0.103)	0.915 (0.089)	0.861 (0.118)
Effective number of parties mayor 2000 election	6.313 (2.438)	6.538 (2.522)	5.784 (2.265)
Legislative council size in 2000	11.340 (3.036)	11.063 (2.848)	11.351 (3.152)
Share of employment in industrial sector	0.081 (0.128)	0.087 (0.125)	0.067 (0.136)
Share of employment in agricultural sector	0.804 (0.228)	0.779 (0.241)	0.851 (0.197)
Latitude	-16.543 (5.994)	-17.892 (4.978)	-14.865 (6.691)
Altitude	574.356 (316.250)	610.906 (315.297)	527.930 (312.059)
Longitude	42.721 (3.180)	43.251 (3.273)	41.937 (3.034)
Distance to state capital	230.411 (130.993)	238.053 (125.704)	218.340 (121.128)
Distance to federal capital	855.811 (385.615)	788.059 (337.630)	956.198 (412.920)
Size of municipality (km)	704.353 (963.814)	572.189 (701.191)	699.630 (838.060)
Number of municipalities	930	191	190

Notes: The sample consists of those municipalities that had at least two elections prior to Brazil's dictatorship in 1964. Low political concentration denotes those municipalities in the bottom 25 percent of the distribution of the Herfindahl index. High political concentration denotes those municipalities in the top 25 percent of the distribution of the Herfindahl index.

TABLE 6: POLITICAL CONCENTRATION PRE-1982 AND LONG-TERM DEVELOPMENT OUTCOMES

	(1)	(2)	(3)	(4)	(5)	(6)
	<i>Dependent variables:</i>					
Panel A. Economic development	Log income per capita		Log industrial plants per capita		Log public employees per capita	
Political Concentration Index pre 1982	-0.599 [0.117]***	-0.283 [0.106]***	-0.993 [0.288]***	-0.760 [0.265]***	0.848 [0.164]***	—
Observations	791	791	764	734	789	—
R-squared	0.67	0.75	0.48	0.57	0.07	
<u>Panel B. Human development</u>	Years of schooling		Life expectancy		Infant mortality	
Political Concentration Index pre 1982	-1.984 [0.260]***	-0.628 [0.181]***	-2.184 [1.029]**	-2.484 [1.014]**	6.584 [3.632]*	7.689 [3.560]**
Observations	791	790	791	791	791	791
R-squared	0.51	0.80	0.52	0.54	0.53	0.55
Panel C. Public goods and politics	% Households with sanitation		% Households with electricity		Number parties legislature election	
Political Concentration Index pre 1982	-0.266 [0.072]***	-0.128 [0.071]*	-0.124 [0.032]***	-0.061 [0.032]*	-3.94 [0.727]***	-3.164 [0.722]***
Observations	791	791	791	791	791	788
R-squared	0.54	0.64	0.39	0.45	0.1	0.14
Control for dependent variable in 1970	No	Yes	No	Yes	No	Yes
Geographic controls	Yes	Yes	Yes	Yes	Yes	Yes
State Fixed-Effects	Yes	Yes	Yes	Yes	Yes	Yes

Notes: All dependent variables are defined for 2000 except Log industrial plants for 1995 and Log public employees for 2003. Political Concentration Index is a Herfindhal index of the share of terms a family was in power as mayor between 1947 and 1982. The sample includes municipalities in the states of Alagoas, Ceará, and Minas Gerais. For the state of Alagoas observations start in 1960. Municipalities with less than 5 elections across the period are excluded from the sample. Number of parties in legislature elections is the effective number of parties for vereador election. Geographic controls include: latitude, longitude, altitude, distance to the federal capital, area of the municipality in 1970. * indicates statistical significance at the 10% level, ** at the 5% level and *** at the 1% level. Robust standard errors are reported in brackets.

TABLE 7: LAND INEQUALITY, POLITICAL CONCENTRATION PRE-1982, AND LONG-TERM DEVELOPMENT OUTCOMES

	(1)	(2)	(3)
	<i>Dependent variables:</i>		
Panel A. Economic development	Log income per capita	Log industrial plants per capita	Log public employees per capita
Political Concentration Index pre 1982	-0.280 [0.106]***	-0.710 [0.263]***	0.804 [0.162]***
Land inequality 1975	0.066 [0.094]	0.592 [0.242]**	-0.61 [0.207]***
Observations	791	734	789
R-squared	0.75	0.57	0.09
Panel B. Public goods	Years of schooling	% Households with sanitation	% Households with electricity
Political Concentration Index pre 1982	-0.609 [0.180]***	-0.132 [0.071]*	-0.058 [0.032]*
Land inequality 1975	0.553 [0.172]***	-0.061 [0.062]	0.069 [0.027]**
Observations	790	791	791
R-squared	0.8	0.64	0.45
Panel C. Politics and patronage	Life expectancy	Infant mortality	Parties legislature election
Political Concentration Index pre 1982	-2.383 [1.014]**	7.229 [3.563]**	-2.928 [0.695]***
Land inequality 1975	1.507 [0.873]*	-6.741 [3.080]**	4.309 [0.719]***
Observations	791	791	788
R-squared	0.54	0.55	0.18
Control for dependent variable in 1970	Yes	Yes	Yes
Geographic controls	Yes	Yes	Yes
State Fixed-Effects	Yes	Yes	Yes

Notes: All dependent variables are defined for 2000 except Log industrial plants for 1995 and Log public employees for 2003. Political Concentration Index is a Herfindhal index of the share of terms a family was in power as mayor between 1947 and 1982 for the states of Alagoas, Ceará, and Minas Gerais. For the state of Alagoas observations start in 1960. Municipalities with less than 5 elections across the period are excluded from the sample. Land inequality is the Gini coefficient for land measured in 1975. Number of parties in legislature elections is the effective number of parties for vereador election and Number of parties for mayor election is the effective number of parties. Legislature size is the number of legislators elected in 2000. Geographic controls include: latitude, longitude, altitude, distance to the federal capital, area of the municipality in 1970. * indicates statistical significance at the 10% level, ** at the 5% level and *** at the 1% level. Robust standard errors are reported in brackets.

TABLE 8: POLITICAL POWER CONCENTRATION AND PERSISTENCE IN THE DEMOCRATIC TRANSITION

Dependent variable:	Share of families that persist into democratic regime					
	(1)	(2)	(3)	(4)	(5)	(6)
Political concentration dictatorship Herfindhal	0.287 [0.078]***	0.261 [0.078]***			0.181 [0.090]**	
Political concentration dictatorship share families			0.178 [0.039]***	0.144 [0.041]***		0.087 [0.046]*
Share of families that persist into dictatorship					0.19 [0.030]***	0.175 [0.030]***
Political concentration pre-dictatorship Herfindhal					0.118 [0.051]**	
Political concentration pre-dictatorship share families						0.083 [0.035]**
Income inequality 1980		-0.104 [0.054]*		-0.105 [0.054]*	-0.076 [0.062]	-0.077 [0.061]
Land Inequality 1980		-0.047 [0.060]		-0.047 [0.059]	-0.087 [0.065]	-0.086 [0.065]
Observations	837	837	860	837	498	498
R-squared	0.05	0.07	0.06	0.07	0.17	0.17
Demographic characteristics 1980	No	Yes	No	Yes	Yes	Yes
Restricted sample pre-1964 information	No	No	No	No	Yes	Yes
Geographic controls	Yes	Yes	Yes	Yes	Yes	Yes
State Fixed-Effects	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Dependent variable is the % of families in power for at least 1 period during dictatorship that are in power for at least 1 period in the democratic regime (after 1985). Political Concentration Herfindhal is an index of based on the sum of the squares of the share of terms a family was in power as mayor between 1964 and 1982. Political concentration share of families is minus the number of families in power divided by the number of elections. Information available for the states of Alagoas, Ceará, and Minas Gerais. For the state of Alagoas observations start in 1960. Municipalities with less than 5 elections during the dictatorship period and less than 3 elections in the pre-dictator period are excluded from the sample. Income inequality is the Theil index for 1980, land Inequality is the Land Gini for 1980. Demographic characteristics in 1980 include: Log income per capita, population density, % urban population. Geographic controls include: latitude, longitude, altitude, distance to the federal capital, area of the municipality in 1970. The restricted sample only includes municipalities where at least 3 elections were available before 1964. * indicates statistical significance at the 10% level, ** at the 5% level and *** at the 1% level. Robust standard errors are reported in brackets.

TABLE 9: TRANSFERS TO STATES AND VOTE SHARE OF MILITARY PARTY

Dependent variables:	Δ Vote share military party (1976-1982)	
	(1)	(2)
Δ Transfers per capita to states 1975-1981	0.182 [0.071]**	0.177 [0.071]**
Δ Population density	N	Y
Δ Share urban population	N	Y
Δ Log income per capita	N	Y
Δ Log population	N	Y
Observations	3134	3127
R-squared	0.02	0.03

Notes: All regressions control for the changes in urban population, population density, Log population and income per capita between 1970-1980. The sample excludes capitals and states that had less than 1% of municipalities with no elections. There are 193 municipalities, excluding the capitals, that did not have election between 1970-1980. municipalities. Regional trends are dummy variables for the 4 regions of Brazil (N, NE, CO, SE). * indicates statistical significance at the 10% level, ** at the 5% level and

TABLE 10: POLITICAL PERSISTENCE AFTER REGIME TRANSITION AND LONG-TERM DEVELOPMENT OUTCOMES

	(1)	(2)	(3)	(4)	(5)	(6)
	<i>Dependent variables:</i>					
Panel A. Economic development	Log income per capita		Log industrial plants per capita		Log public employees per capita	
Share families persisted	-0.115 [0.047]**	-0.126 [0.048]***	-0.156 [0.155]	-0.153 [0.155]	0.191 [0.093]**	0.205 [0.094]**
Political Concentration Index democracy		-0.161 [0.073]**		0.050 [0.215]		0.214 [0.180]
Observations	837	837	772	772	834	834
R-squared	0.76	0.77	0.57	0.57	0.04	0.05
Panel B. Public goods	Years of schooling		Life expectancy		Infant mortality	
Share families persisted	-0.25 [0.095]***	-0.256 [0.096]***	-0.677 [0.500]	-0.725 [0.506]	2.656 [1.763]	2.803 [1.783]
Political Concentration Index democracy		-0.081 [0.141]		-0.760 [0.752]		2.342 [2.606]
Observations	836	836	837	837	837	837
R-squared	0.81	0.81	0.55	0.55	0.55	0.55
Panel C. Politics and patronage	% Households with sanitation		% Households with electricity		Parties legislature election	
Share families persisted	-0.055 [0.028]**	-0.053 [0.028]*	-0.018 [0.017]	-0.018 [0.017]	-0.932 [0.365]**	-1.032 [0.368]***
Political Concentration Index democracy		0.022 [0.040]		-0.001 [0.023]		-1.571 [0.579]***
Observations	837	837	837	837	812	808
R-squared	0.51	0.51	0.43	0.43	0.12	0.15
Control for dependent variable in 1970	Yes	Yes	No	Yes	No	
Geographic controls	Yes	Yes	Yes	Yes	Yes	
State Fixed-Effects	Yes	Yes	Yes	Yes	Yes	

Notes: All dependent variables are defined for 2000 except Log industrial plants for 1995 and Log public employees for 2003. Share of families that persisted is the number of families in power during the dictatorship (1964-1985) that were also in power after democratization divided by the total number of families that were in power during the 1964-1985 period. Political Concentration Index is a Herfindhal index of the share of terms a family was in power as mayor between 1947 and 1982 for the states of Alagoas, Ceará, and Minas Gerais. For the state of Alagoas observations start in 1960. Municipalities with less than 5 elections across the period are excluded from the sample. Number of parties in legislature elections is the effective number of parties for vereador election and Number of parties for mayor election is the effective number of parties. Legislature size is the number of legislators elected in 2000. Geographic controls include: latitude, longitude, altitude, distance to the federal capital, area of the municipality in 1970. * indicates statistical significance at the 10% level, ** at the 5% level and *** at the 1% level. Robust standard errors are reported in brackets.