

Democracy and Economic Performance: Micro Evidence from Brazil¹

Abstract

This paper creates democracy indicators for over 4000 municipalities in Brazil, and studies their impact on economic performance. Municipality-level growth regressions control for the effects of local crop production and their price movements, the sectoral composition of the local economy, income inequality, inflation, ethnic and religious composition of the population, and a conditional convergence parameter, in addition to two democracy indicators: Political Participation and Political Competition. Participation measures voting rates and competition measures the closeness of election outcomes. Both have statistically and economically significant effects on growth, but in opposite directions. Participation enhances growth partly by forcing politicians to provide more public services, while competition deters growth possibly due to the wasteful conflict expenditures associated with stiffer political competition. These results help clarify the lack of consensus in the cross-country democracy-growth literature.

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Introduction

Amartya Sen has forcefully argued that democracy and political rights are intrinsically good, and irrespective of their impact on economic performance, are desirable outcomes. In spite of this argument, both economists and political scientists have long been interested in the nature of the relationship between democratic institutions and economic performance. Theoretical research has tried to relate a specific aspect of the democratic process – such as electoral institutions, lobbying, or multi-party competition - to economic outcomes, while empirical research has examined whether political rights are determinants or consequences of economic development. The bulk of the empirical work uses country level data to evaluate the economic impacts of democracy. The typical article runs cross-country growth regressions with democracy and political rights indices added to the set of explanatory variables.³ Apart from the usual methodological flaws associated with cross-country regressions⁴, an added shortcoming of these studies is the imprecise measure of democracy that the subjective country-level indices provide.⁵ Across countries, political systems vary along many dimensions, and it is difficult to summarize all relevant components of this variation using a scalar index.

The purpose of this paper is to provide more micro-level evidence on the impact of democracy on growth by exploiting within-country variation in the extent of democracy across Brazilian municipalities. In Brazil, while the electoral rules stay roughly constant across states and municipalities, political participation and competition vary due to underlying differences in regional political cultures. Using election data from municipal, state and federal elections during the 1990s, we construct municipality-level measures of political participation and of the intensity of competition between parties. These measures are inspired by Dahl's (1968) theory of polyarchy, in which he identifies

³ See Tavares and Wacziarg (2000) and Brunetti (1997) for a review of democracy-growth papers. Exceptions to the country level analysis include Betancourt and Gleason (2000), who investigate the impact of voter turnout on public goods in rural India, and Foster and Rosenzweig (2001) who look at the impact of electing local officials on the types of public goods provided in Indian villages.

⁴ See Durlauf (2001) and Brock and Durlauf (2000) for reviews.

⁵ Most studies use the Gastil / Freedom House index, which subjectively classifies countries based on the authors' evaluation of media reports about the country, as well as some objective data on the structure of the political system.

the right to compete (political competition or public contestation) and the right to participate (inclusiveness) as the two most empirically relevant dimensions of democracy. Participation rates are important since voting is the primary mechanism through which constituents provide feedback to politicians vying for office. Political competition is necessary to ensure that this feedback is meaningful and that elected officials have the potential to be punished. Participation and competition are therefore two components of the system of checks and balances so crucial to a functioning democracy.

In reality, political competition and participation reflect only a small component of the very complex system that we call democracy. One important aspect of democracy is the power of the individual voter relative to the politician who represents his or her interests. In a representative democracy, it is imperative that the individual voter's voice be heard, and that the median voter's preference be represented, even if that strays far from the politician's own personal preference. The contention of this paper is that the measures of participation and competition are useful proxies for the importance of the median voter vis-à-vis the elected politician (or the special interest groups who s/he is influenced by) in policy choices and outcomes. Voters can only threaten the elected official through voting - which makes participation important, and this threat is only meaningful if the voter has alternatives - which is why a lack of political competition can make the system less democratic. This is admittedly a narrow notion of democracy, and ignores many other important components of democracy such as the role of the media and the justice system. However, in Brazil where local politicians may be more or less responsive to voter demands across different regions depending on the local political conditions, these measures of competition and participation are useful indicators of this particular aspect of democracy.

Brazil provides an ideal setting in which to evaluate the impact of democracy on development at the micro level. Due to its rich and volatile political history, Brazil has developed tremendous regional variation in the extent of participation and competition. As a large middle-income developing country with high income inequality, economic performance measures also vary across regions. The measures of democracy developed here are also empirically relevant for Brazil. In low-income countries with a substantial

uneducated populace, political participation or voting rates are useful indicators of the level of political consciousness of the electorate.⁶ People hold strong party loyalties in certain regions of Brazil, and political competition measures therefore indicate the effective threat to incumbents of losing power.

The primary indicator of economic performance used in this study is the growth rate of GDP per capita in the “município” between 1990 and 1996. The regression specifications include most controls found in cross-country growth regressions, in addition to dummies for the 27 states, and a series of production and price variables that capture the importance of particular crops and fluctuations in their price to município incomes. There were 4491 municípios in existence until 1993, and our sample includes 4235 (91%) of those municípios. As a supporting exercise, we study the impact of the democracy variables on the allocation of public health and education services, to identify the channels through which particular democracy measures affect the economic growth rate.

Theoretical predictions on the impact of greater democracy on growth rates are generally ambiguous. Mancur Olson has argued that the institutions required for democracy to succeed are the same institutions that provide security of property rights. The political theorist Samuel Huntington has argued, conversely, that authoritarian regimes are better able to suppress disruptive dissent and conflict, which relieves interest group pressures that democracies are susceptible to. Models based on majority voting have concluded that the presence of elections tends to increase the country’s stock of human capital, as the median voter typically prefers greater redistributive expenditures on education. This overall ambiguity surrounding the democracy-growth relationship arises partly due to the fact that each theory is an argument based on one particular aspect of the democratic process. Huntington, for example, considers the impact of political competition, whereas the median voter models derive the economic implications of the voting mechanism. Empirical tests of these models using country-level subjective

⁶ This is not necessarily true for the developed world, where the majority of the population is politically conscious, and voting rates tend to reflect other factors such as the uncertainty associated with the outcome. In the United States, the voting rate in a certain area is sometimes low when one particular party is assured of victory. Expectation of a landslide victory reduces the marginal benefit of any individual voter’s effort. While these effects are likely present in Brazil as well, variations in voter turnout are more correlated with variations in political consciousness.

indicators of democracy lead to similarly ambiguous findings.⁷ One advantage of the Brazilian data is that we are able to look at the impacts of political competition and participation separately, which allows for more precise and less aggregated tests of individual theories.

The economic impact of greater political participation is generally well understood. Politicians are forced to be more responsive to their constituents' needs when voters show up at the polls and threaten incumbents with the possibility of voting for someone else. Greater participation is therefore expected to lead to better and more efficient public service allocation, which should lead to better economic performance. The economic consequences of greater political competition are less clear due to the complex nature of competition across different types of political systems. Mobarak (2001) characterizes political systems in terms of a distribution of power across different political groups, and a more even distribution of power is interpreted as more competitive. If these groups are in conflict vying for a common prize such as an election, there is greater incentive for all groups to invest in wasteful conflict expenditures in more competitive systems. More intense competition is therefore worse for economic performance in that model. On the other hand, greater competition may force incumbent governments to behave "appropriately" in terms of allocating the right types of public services where they are needed most.

Our study of the determinants of growth across Brazilian municipios finds that greater political participation is conducive to growth while political competition deters growth. The results help to clarify the ambiguity surrounding the democracy-growth relationship. If the effects of competition and participation are summed, the net effect on growth is ambiguous. The effect of participation and competition are both statistically and economically significant. A five percentage point increase in the participation (or voting) rate increases the annual growth rate by 0.3 percentage points. To further pin down the channel through which political participation enhances growth, we present results on the impact of participation on the allocation of public health and education services. We find by showing up at the polls, constituents are able to attract more

⁷ Reviews of empirical research on democracy-growth indicate that there is no consensus on the direction of the relationship, and uncovered correlations are not robust to alterations in specification and the set of

schools, teachers, doctors, nurses and clinics to their municipality. Better education services in turn promote growth.

The Brazilian Political System

Brazil has had a rich, varied, and highly volatile political history.⁸ Since gaining independence in the early nineteenth century, the country has oscillated between centralized authority and more democratic sub-system autonomy. During 1822-1889, Brazil had a centralized constitutional monarchy with little regional autonomy. The Emperor appointed Senators for life, presided over a Council of State, and designated police and judicial officials at his own discretion. The Republic established in 1889 introduced a federalist system patterned after the U.S. model. This provided greater autonomy to the larger and more powerful states, but the peripheral states remained susceptible to interventions by the central government. A military rebellion against this system of state oligarchies in the 1920s centralized power once again. From 1930 to 1945, the national government appointed all state governors, who in turn appointed all municipal mayors. The country returned to representative democracy in 1945 under a new constitution, but this lasted only till 1964, when military rule was re-established. The military government started liberalizing slowly in the 1980s, and allowed direct election of state governors in 1982. The liberalization process culminated in the democratic constitution of 1988, when a regular schedule of federal, state and municipal elections was re-established.

Since 1988, both state and municipal governments have played important roles in policy-making and in the provision of public services. For the period covered by our GDP growth and political data, state governments had responsibilities for maintaining state highway systems, public primary and secondary schools, water and sanitation infrastructure, public hospitals, transit police and administration. Municipal governments bore the responsibility for some public primary and secondary schools, public clinics, and

control variables.

⁸ Our two primary sources for the political history of Brazil presented in this section are Fleischer (1995) and Kingstone and Power (2000)

for operating water, sewer and garbage services. The municipal taxing authority was limited to property and service taxes. A system of direct block grants from the federal to the municipal governments was in place. Richer states (such as Sao Paulo or Rio de Janeiro) enjoyed considerable fiscal autonomy, but poorer states relied heavily on federal grants and funding of special projects by congress.

To construct the political variables and indicators of democracy used in the regressions, we rely primarily on data from the 1994 general elections, which were held to elect twenty-seven state governors and the country's President. The gubernatorial elections were held in two rounds in which the top two candidates from the first round had a run-off in case no candidate achieved an absolute majority. In nine states the elections were decided in the first round, whereas in six of the eighteen runoffs, the first round results were reversed. PMDB⁹, which is traditionally the strongest party and provided the main opposition to the military regime in earlier decades, slightly increased its number of governors to nine relative to the previous round of elections, but lost two key states – Sao Paulo and Parana. The second strongest party, PPR¹⁰ increased its representation to five governors, but three of the new governors were concentrated in the less developed western Amazonas region. Power, at the state level, was therefore distributed across several different parties and coalitions.

Brazilians have strong regional political identities passed on from the colonial period, which is the underlying cause of the regional variation in political participation and competition that we observe. Due to higher levels of industrialization, per capita income, labor union membership and schooling, the level of political consciousness of the electorate in southern states like Rio de Janeiro and Sao Paulo are much higher. Participation rates we observe are about five percentage points higher in these states than in the rest of Brazil. Due to a history of domestic conflicts and civil wars in the River Plate basin, the populace in the southern states of Santa Catarina and Rio Grande do Sul hold strong party loyalties. Some national parties have had weak showings in these areas as a result. In contrast, the western frontier states, which experience constant immigration, politics are in constant flux as many politicians and voters are new-comers

⁹ Partido do Movimento Democrático Brasileiro

¹⁰ Partido Progressista Reformador

with no local political roots and traditions. We observe that municipal elections are competed over more stringently in these areas.

Data

The Superior Election Court (TSE)¹¹ reports the names and basic characteristics of all candidates running for office, and the number of votes received by each candidate in each municipio for Presidential, state gubernatorial and municipio mayoral elections held since 1994. Elections are held at four-year intervals, and municipal elections are staggered by two years (1992, 1996, 2000) relative to state and federal elections (1994, 1998). Constrained by the years for which growth data are available, we concentrate on the 1994 and 1996 elections. We construct a measure of political participation as the number of votes cast in these elections (excluding null and blank votes) in each municipio as a fraction of the municipio population. We do sensitivity checks by changing the definition of the denominator to the number of registered voters, and by including null and blank votes in the numerator, but the results do not change qualitatively in response to these alterations. To measure the lack of political competition, we construct a concentration (Herfindahl) index of the vote shares of each candidate.¹² We also experiment with the vote share of the winner as an alternate measure (which provides a less complete picture of political competition), but again the results do not change significantly. Some other political variables we construct from the TSE database include the number of voting locations per unit area, an indicator for electronic voting availability, the vote share of leftist parties (who are possibly more redistributive), the vote share of the winning coalition in the 1994 Presidential election, and a dummy that indicates whether the elected state governor is from the same party as the municipal mayor.

¹¹ Tribunal Superior Eleitoral

¹² The concentration index equals $\sum_{i=1}^n v_i^2$ where v_i is the vote share of candidate i , and n is the number of candidates.

For municipality-level GDP data, we rely on estimates constructed by two sets of authors – IPEA (2001)¹³ and Andrade and Serra (1999). Both papers rely on data from the Censuses of Population, Industry, Agriculture and Services to construct municipio GDP measures. These censuses are administered by the Brazilian national statistical institute (IBGE). Both papers provide the GDP estimates in real terms, and Andrade and Serra (1999) break down the GDP estimate into contributions from the primary, secondary and tertiary sectors. To take advantage of the better time series coverage in IPEA (2001), we use their estimates to compute the growth rates of GDP per capita between 1990 and 1996, as well as start of period GDP per capita (to test conditional convergence). The Andrade and Serra (1999) data is used to measure the agriculture, industry and services shares of GDP.

It should be noted that the geographic boundaries of some municipios do not stay constant over time. The system of lump-sum transfers from federal to local governments has created strong incentives for municipios to split and create additional municipalities. In fact, the number of municipios increased from 4491 at the time of the 1991 census to 5112 during the 1994 elections. We normalize municipio GDP by population data for the exact time frame for which the GDP data is estimated, so that artificial movements in GDP per capita are not generated as a result of changing geographic definitions.

A number of control variables were constructed using municipal aggregations of 1991 Population Census data. Using data on ethnicities, in which respondents report whether they are white, black, yellow, mulatto or indigenous, we constructed a measure of ethnic fractionalization at the municipio level. Similarly, using data on self-reported religious affiliations, we construct a religious fractionalization measure. In both cases, we also create variables for the presence of minorities by computing the fraction of municipio population that is indigenous and the fraction who are non-Christians. The census data also allows IBGE (the national statistical agency) to construct a municipio level Gini Coefficient of income inequality. Finally, we construct some geographic controls such as the fraction of population living in urban areas, indicators for municipios in major metropolitan regions and state capitals.

¹³ IPEA or Instituto de Pesquisa Economica Aplicada is the Brazilian Institute of Applied Economic Research.

The data on education services are obtained from the 1996 Bases de Informacoes Municipais CD that IBGE produces, but the original data source is the National Institute of Education Studies and Research (INEP)¹⁴, which is part of the Brazilian Education Ministry. This database reports the number of schools, teachers and students in each municipio broken down by ownership of the school (federal, state, municipal or private). The public services regressions in table 3 use public provision of teachers as a dependent variables and private provision as a control. The growth regressions control for the fraction of the population enrolled in all types of schools. The data on health services were obtained from the Assistencia Medico Sanitaria (AMS) survey of health facilities conducted in 1998, as well as the Sistema Unico de Saude (SUS) database maintained by the Ministry of Health. Brazil has a two-tiered system of health-care access, in which private facilities cater to the wealthy, and the rest of the country relies on an overburdened system of public clinics and hospitals (Alves and Timmins 2000). The public system, federally financed by SUS, is expected to cover the healthcare needs of those without private health insurance. SUS is a decentralized system that contracts out some services to private healthcare providers. The public health services regressions in table 3 use SUS provision of clinics and doctors as dependent variables, and control for their non-SUS private counterpart on the right-hand-side.

Using agricultural data that the IBGE collects (from the Censo Agropecuário), we gauge the relative importance of particular crops to municipio incomes. We pick the most important crops to each municipio in terms of the fraction of land area devoted to harvesting those crops, and then create some production measures. Included in the regressions are production of coffee, beans, bananas, sugarcane, maize, cassava and oranges, all normalized by the total GDP. We also interact these production measures with data on the fluctuation of monthly prices in local markets from the National Consumer Price Index (INPC).¹⁵ The INPC price survey was conducted in 11 major metropolitan regions, the majority of which are located on the densely populated eastern coast of Brazil. Figure 1 shows the location of these metropolitan areas, along with Brazilian state and municipio boundaries. INPC reports an index of monthly increases in

¹⁴ Instituto Nacional de Estudos e Pesquisas Educacionais

¹⁵ Índice Nacional de Preços ao Consumidor

prices for narrowly defined products (such as rice, bananas, potatoes etc) as well as a general cost-of-living index. We created measures of average yearly inflation for each product of interest, the standard deviation of monthly prices, and inflation of product price relative to general inflation in Brazil. Municipios were geographically matched to these 11 metro regions using a combination of GIS distance calculation techniques¹⁶, and information on the states in which the metro region is located. Summary statistics on the data used for the regressions are reported in table 1.

Regression Specifications and Results

The main regression of this paper, reported in table 2, is a cross-sectional study of the determinants of the growth rate of GDP per capita between 1990 and 1996 across Brazilian municipalities. The models mirror the standard specification in the cross-country growth literature. Growth of GDP per capita is posited to be a function of the initial income level, human capital and a variety of socio-economic indicators. Compared to the standard cross-country specification, we are able to better characterize the evolution of municipio incomes using a series of crop production and price variables. All specifications include variables measuring production of the seven most important crops normalized by GDP per capita. These production variables are then interacted with an average yearly price increase measure for that crop. The rationale is that price increases for a crop that is a major product of a particular municipio should positively affect per-capita incomes in that municipio. State level fixed effects are included for all specifications, and they are meant to capture state-wide shocks to income.

Although the democracy measures are the variables we focus on, some of the other controls are of independent interest. A number of authors have studied the impact of ethnic divisions on economic performance, both across countries (Easterly and Levine 1997), and within particular countries (Alesina, Baqir and Easterly 1999, Miguel 2001).

¹⁶ We matched municipios to metro regions by calculating which of the 11 metro regions is closest to each municipio using Arcview. Sometimes when two cities are located close to the same distance from a particular municipio, the city located within the same state as that municipio was given preference, since it could be considered more the “local market” for that municipio. In some cases, including most municipios in the Western states, an average of the price information for two or more cities was used.

These authors have found that ethnic fragmentation helps explain Africa's poor growth performance, and is negatively associated with local provision of productive public goods. Our regressions include measures of both ethnic diversity and the presence of minorities. Minority presence can also negatively impact the allocation of public goods (Betancourt and Gleason, 2000). We also include measures of religious fractionalization and presence of religious minorities. These variables ought to affect economic performance through the same channels as ethnic diversity, if the model linking heterogeneity of preferences across ethnic groups to smaller tax bases (that Alesina, Baqir and Easterly, 1999 postulate) also hold for groups defined on the basis of religious affiliations.

A large body of theoretical and empirical literature is devoted to the study of income inequality on economic performance.¹⁷ Much of the empirical literature is based on OLS or panel estimates of the impact of a country-level Gini coefficient on the economic growth rate. This literature has not arrived at a consensus on the nature or direction of the inequality-growth relationship. The earlier cross-sectional regressions find a negative impact of inequality on growth while fixed effects estimates on panel data find a positive impact, and others have since presented evidence of structural breaks and non-linearities. The Gini coefficient of income for municipios allows us to present some cross-sectional evidence at the micro level. The average income in the richest state in Brazil is about seven times that of the poorest state, and there are large variations in income inequality across regions. However, it would be difficult to interpret any income inequality result causally, since the identification problems that plague the cross-country work are also likely to be present here.

The literature that investigates the impact of inflation on economic performance is also quite prominent (see Barro 1995). Empirical work in this area has found that significant negative associations between inflation and growth performance exist in the sample of countries that have experienced hyper-inflation. Brazil during our sample years (1990-96) presents a good case for the study of inflation and growth. The monthly inflation rate in Brazil reached 79% in early 1990 and 50% again in 1994 before a stabilization plan lowered the yearly rate to single digits by 1996. We use monthly

¹⁷ See Duflo and Banerjee (2000) for a discussion of the literature

consumer price index data to construct measures of average yearly inflation and the variability (standard deviation) of monthly inflation. Again, the uncovered correlations between inflation and growth should be interpreted carefully, since there are legitimate concerns about identification.

Results

The regressions in table 2 show strong evidence of conditional convergence. In all specifications, initial GDP per capita (measured in 1990) has a negative sign and is highly significant. Using the natural log of GDP per capita as a control and interpreting the regression equation as a test of the augmented Solow model, we can calculate the convergence rate from the coefficient on logged GDP per capita.¹⁸ The convergence rate is estimated to be 0.08, which implies that per-capita income is converging to its steady-state level at a rate of 8% per year. The early consensus on the convergence rate for cross-country growth regressions was 0.02, although Caselli, Esquivel and Lefort (1996) argued that these early estimates were flawed and convergence actually stood at around 10% per year. Our estimate falls within this range.

Of the state dummies (whose coefficients are not reported in the tables), only Rondonia and Sao Paulo have significant positive coefficients. Rondonia is a state located close to the Amazons in the hitherto under-developed northwestern region. It experienced a lot of in-migration during our sample years. The migration rate into Rondonia as a fraction of pre-existing population was twice that of the Brazilian national average. Rondonia is also one of the smallest states in terms of population and the number of municipios. It's GDP per capita grew at an average of almost 6% per year between 1990 and 1996, which is the largest jump in income levels across all states over this period. It was one of the poorer states in 1990, but by 1996 its GDP per capita caught up to the national average. Sao Paulo is the diametric opposite of Rondonia in terms of the characteristics of its economy. It is the most industrialized, and one of the first states to have developed in Brazil. Its income level has remained almost twice that

¹⁸ The regressions presented in table 2 only use un-logged GDP per capita

of the national average through the sample period. The migration rate into Sao Paulo is also higher than the national average, but type of in-migrants it attracts has traditionally been very different from the type of people that migrate to the Western frontier states such as Rondonia. People typically come to Sao Paulo looking for jobs in industries, often to live there only temporarily rather than to settle. Unlike Rondonia, the growth rate of GDP per capita in Sao Paulo is not very different from the national average.

The coefficients on the production of crops and their interactions with crop price increase have the following general pattern: production variables are negatively associated with growth, while the production-price interactions have a positive impact. This indicates that when the municipio economy is reliant on one particular agricultural product, the growth rate is lower, but a price increase for that product positively affects growth rates, particularly in municipios where the product is a significant component of GDP. The negative association between growth and reliance on a product may be a result of a risk-return tradeoff. In areas where one crop is dominant, there is a greater need for risk diversification through other means. Typically, diversifying risk involves a cost in terms of lower average returns.

On average, these crops are harvested in only about 1-4% of the land area across all municipios, but this overall average is low because many municipios are non-agricultural. For each of the crops included in the regressions, there are over 150 municipios in which at least a fifth of the land area is devoted to harvesting a particular crop. The price variables measure price increases for each crop, which do not always coincide with increases in the general price index for Brazil. Inflation of the general price index is controlled for separately in the regressions. Not surprisingly, the overall inflation variable has strong positive correlations with all the individual crop-price increase variables. The positive coefficients in the price variables imply that in the short-run, price increases are not always just nominal changes; they have real effects.

In addition to the state dummies and production – price interactions, specification 2a in table 2 includes initial GDP per capita, measures of ethnic and religious fractionalization and presence of minorities, inflation and the standard deviation of monthly inflation, political participation and competition, and the industrial and services sectors' contributions to GDP. For the sectoral composition measures, the agricultural

sector is the “omitted category”, and the negative coefficients in the two included variables therefore imply that growth rate is higher on average in predominantly agricultural municipios than in industry or services sector dominated municipios. These variables, however, may be picking up the effect of faster growth in the previously under-developed northwestern region.

Consistent with the early cross-country literature on inequality and growth, we find a significant negative association between income inequality and the municipio growth rate. A one standard deviation increase in the Gini Coefficient is associated with a one percentage point lower annual growth rate. The inflation rate also has a significant negative association with growth. The coefficient on the standard deviation of monthly inflation variable has a negative sign, but it is not significantly different from zero. While all these coefficients have the predicted signs and are broadly consistent with the previous literature, we stop short of imposing any causal interpretations on these results due to concerns about identification. The direction of causality in the inequality-growth relationship is not so clear-cut, and it is imprudent interpret these relationships causally on the basis of a cross-sectional OLS regression.

Curiously, ethnic fractionalization has a positive impact on growth, but this relationship is not uniformly significant. The presence of indigenous people, an ethnic minority who constitute less than 1% of the population, and who have historically been marginalized, has no discernible impact. Our measure of ethnic fractionalization is positively correlated with the percentage of blacks (correlation +0.41), who are the largest minority group and constitute about 5% of the population.¹⁹ It is possible that the ethnic fractionalization variable partly picks up the effect of the relative abundance of blacks in the depressed Northeast region. However, adding the proportion of blacks in total population to the set of regressors does not change the positive coefficient on ethnic fractionalization, although the black variable itself has a negative significant coefficient. Ethnic fractionalization is lowest in the predominantly white southern states of Rio Grande do Sul and Santa Catarina. The proportion of whites in these states is about 90%, and this homogeneity makes the value of ethnic fractionalization very small. These are

¹⁹ Whites and Mulattos are the other 95%. The proportion of “Yellow” and “Indigenous” are less than 1%.

also among the richer states, where the potential for further growth is lower. This may help explain the curious ethnic fractionalization result.

Fractionalization of religious groups has a negative impact on growth. It should be noted that due to the numerical dominance of Roman Catholics in Brazil (about 85-90% of total population), the religious fractionalization variable effectively measures the presence of religious groups other than Catholics. Presence of non-Christians (a very small minority which constitutes about 0.1% of the population) has no significant impact on growth, but its coefficient has a uniform negative sign across specifications. It is not surprising that fractionalization across religious denominations has more of a growth impact than across ethnicities. A large portion of the Brazilian population is of mixed ethnicity (about 45% of Census 1991 respondents classify themselves as “mulatto”), and it is therefore difficult to distinguish people on the basis of ethnicity. Religious denomination distinctions are much clearer, and may be the more appropriate empirical proxy for the preference heterogeneity that drives the Alesina et al (1999) argument.

Our measure of political participation varies between 0 and 1, and has a relatively low mean of 0.52 since we use total population, rather than eligible voting population as the denominator.²⁰ If the denominator is restricted to the eligible voting population, the political participation average increases to 0.77. A voting rate of 77% is still low, considering the fact that voting is required of everyone who is eligible. However, this number is consistent with rates reported in other studies on Brazil. The concentration index of vote shares of all candidates (lack of political competition) can theoretically vary between 1 and the inverse of the number of candidates. When one candidate receives all votes (no competition), this measure equals 1. In practice, the concentration index for the 1994 gubernatorial election that we compute varies between 0.21 and 0.87. There were 39 municipios where one candidate received more than three quarters of the votes. Half of these municipios are located in the northwestern state of Amazonas, where the candidate from the Partido Progressista Reformador (PPR) won easily. PPR is the dominant party in that region.

²⁰ The total population data, which comes from the Censuses, and can be checked using other population surveys done between Census years, is more reliable than eligible voting population data, and is therefore preferred.

Both democracy measures - political participation and political competition have significant impacts on growth, but in opposite directions. As expected, participation enhances growth, and our results indicate that this effect partly works through the public services channel. In specification 2a, the impact of participation on growth is statistically significant, and a five percentage point increase in the voting rate increases growth by 0.3 percentage points. It is possible that this coefficient partly picks up the growth effects of education or urbanization, since voting rates are known to be higher in urban areas and among the educated populace. Specification 2b therefore adds variables measuring education (the fraction of the population enrolled in school) and urbanization (fraction of population living in urban areas, and indicators for major metropolitan regions and state capitals). While the education and urban variables themselves have significant impacts on growth, the political participation coefficient remains significant and just as large. This makes it unlikely that the participation variable is solely proxying for education or urbanization.

The coefficient on the political competition variable also stays statistically significant and equally large after the urban and education variables are added. If a two-candidate election changes from a 50-50 vote share to 60-40, the concentration index increases by 0.02, and the estimated coefficient implies that the growth rate increases by 0.13 percentage points. Put differently, a one standard deviation increase in the concentration index increases the growth rate by 0.65 percentage points. Regression results on the determinants of public service provision reported in table 3 also indicate that the negative effect of greater competition on growth may be partly working through the public services channel. More doctors, teachers and clinics are provided on a per-capita basis in municipios where votes are not dispersed across different political groups. It is possible that incumbent governments are rewarding constituents with better public services in areas where these constituents show greater loyalty.

Specification 2c investigates whether adding other possibly economically relevant measures of politics changes the results with respect to political participation and competition. We create a variable for the vote share of leftist parties who are possibly more redistributive, since the provision of public services seems to be an important channel through which politics affects economic performance. In Brazil, where much of

the economy is outside the control of the formal tax system, redistribution occurs primarily through subsidized health and education services. It turns out that this variable is not a good predictor for the provision of public services, and actually has a negative impact on growth. This is possibly due to the fact that the leftist parties were not in power in the vast majority of states, and this variable therefore indicates municipio votes going to a competitor of the parties in power. To further test whether power has an effect, we add the vote share of the winning coalition in the 1994 Presidential election to the set of regressors. This does not have a significant impact on growth. A dummy that indicates whether the elected state governor is from the same party as the municipal mayor (to measure political connections) is also insignificant. Most relevant for our purposes is the fact that neither the statistical significance or the size of the coefficients for political participation and competition varies once these other measures are added.

Specification 2d tries to tackle perhaps the most difficult econometric issue in this paper. The level of income itself has a positive effect on political participation (richer people are more likely to be politically conscious and are more likely to vote), and therefore the issue of reverse causation between growth and political participation has to be dealt with. The income level in each municipio is controlled for in the growth regression, and therefore if the income effect on voting is only a “level effect”, endogeneity is perhaps not a legitimate concern. Since we also control for the level of education, if the only other causation channel from income to voting is through education, again endogeneity is not an issue. In spite of these arguments, we try instrumenting for political participation in specification 2d. Three instruments are used. The density of voting locations, which is the number of voting location allocated to the municipio by the election commission normalized by area, proxies how easy it is for constituents to travel to the polls to cast their votes. An indicator for electronic voting availability also proxies for the ease of voting.²¹ Finally, the number of public schools per capita in each municipio is added since these usually serve as voting centers. Education is directly controlled for in the growth equation of the 2SLS procedure, which makes it less likely that public schools have a direct impact on growth through the

²¹ Electronic voting was introduced in Brazil to ease the counting of votes by the election commission, rather than the casting of votes.

education channel. The Sargan test of overidentifying restrictions was performed after the 2SLS procedure in column 2d. The Sargan $\chi^2(2)$ statistic equaled 3.001 with a p-value of 0.223. The overidentifying restrictions test therefore could not reject the null hypothesis that the equation is properly specified with these three instruments.

It is clear from column 2d that after instrumenting, both the size of the coefficient for political participation and its standard error are inflated. We investigate whether this is due to the fact that the set of instruments is not strongly correlated with political participation.²² A test of the joint significance of the three instruments in the first stage political participation equation reveals an F-statistic of 70.70 with a p-value less than 0.0000. These instruments therefore jointly explain some of the variation in political participation.

Column 2e is a model of the determinants of political participation, and is indicative of the first stage equation of the two stage least squares procedure. Both public schools per capita and the density of voting locations have significant positive impacts on participation while electronic voting has a negative impact. As expected, voting rates are higher in richer and more urbanized municipios. The state dummies indicate that voting rates are significantly higher in the developed southern states (including Rio de Janeiro, Sao Paulo, Santa Catarina and Rio Grande do Sul), and lower in some states in the relatively under-developed northeast and west (including Amazonas, Bahia and Alagoas). In spite of the significance of the density of voting locations and electronic voting availability in the participation equation, these two variables by themselves do not identify political participation in the 2SLS growth regression very well. Although political participation remains significant after it is instrumented, both the size of the coefficient and the standard error increases by a lot. This coefficient is very sensitive to whether or not the public schools variable is used as an instrument. In specification 2d, the political competition variable loses its significance, but when the public schools variable is omitted from the instrument list, the coefficient on political competition

²² Bound et al (1995) suggest that in cases of weak correlation between the endogenous variable and the instruments, even a weak correlation between the instruments and the error in the second stage equation can lead to inconsistencies in the instrumental variable estimator. Furthermore, the bias of the IV estimate approaches that of the OLS estimate as the partial R^2 between the instruments and political participation approaches zero.

remains positive and significant. On the basis of the test for overidentifying restrictions, column 2d reports results with all three instruments included.

Table 3 tries to identify the channels through which political participation affects growth. In 3a-3f, we study the determinants of public provision of teachers, doctors, and clinics per capita. Political participation has a strong positive impact on the allocation of each of these services, after private provision, incomes, income inequality and some geographic and socio-economic characteristics of the municipios are controlled for.²³ In the columns with headers “2SLS”, political participation is instrumented for using the density of voting locations and the indicator for electronic voting availability.²⁴ In all cases, political participation remains significant after it is instrumented.²⁵ Since education and health are components of human capital which enhances growth, the effect of political participation on growth is partly working through the public services channel. By showing up at the polls and sending an effective signal to incumbent politicians that they are politically conscious and active, constituents are able to attract more education and health services to their area, which in turn promotes local growth.

The regressions in table 3 also indicate that more public services are provided on a per-capita basis in areas where private provision is low, and income inequality is high. Poorer municipios receive more health services per capita, but not education. The directions of these effects are generally consistent with the hypothesis that public services are allocated in the areas where they are needed more. The demand for education typically has greater income elasticity than the demand for health services (for the poorest households, education is a luxury good, while health services are not), which may explain the signs on the average income coefficients in the different models.

²³ The participation results discussed here continue to hold when schools, nurses or hospital beds per capita are used as dependent variables rather than teacher, doctors and clinics

²⁴ Public schools is no longer used as an instrument, since it is now definitionally related to the dependent variable. The migration rate variable is also instrumented since migrants are possibly attracted by better public services. The instrument for migration is the weighted average of distance of all other states from this municipio, where the weights were the percentage of in-migrants who originated in that state.

²⁵ The case for instrumenting out political participation is even less persuasive when public services rather than income growth is the dependent variable. For endogeneity to be an issue, the case has to be made that more doctors and teachers per capita lead to higher voting rates or that

Conclusion

To our knowledge, this paper is the first econometric study of democracy and growth across municipalities in Brazil, and the first to present evidence on the effects of political participation and competition on economic performance at this level of spatial disaggregation. We are able to show that the political system has non-negligible impacts on economic performance, and the nature of these effects depend on what aspect of the political system one considers. Political participation and competition, which political theorists classify as two components of democracy, have opposite effects on growth. Greater political participation leads to better public services, and this enhances growth. More intense political competition is detrimental to growth, possibly due to the wasteful conflict expenditure it induces (as argued in Mobarak 2001, although this precise argument is not directly tested). The analysis therefore helps to clarify the lack of consensus in the cross-country literature on democracy and growth. Depending on the sample or the measure of democracy used, previous researchers have found positive, negative or no effects, and evidence of non-linearities. Papers that summarize all available cross-country evidence conclude that there is no robust relationship between democracy and growth in any direction.

The Brazilian municipal analysis, to the contrary, demonstrates that there are significant patterns in the data, but democracy must be broken down into its components in order to decipher the precise nature of these relationships. The political participation and competition results remain significant after a variety of other variables correlated with democracy are controlled for in the growth and public services regressions. Perhaps this Brazilian evidence is much clearer than the cross-country evidence because at the micro level, it is easier to identify the channels through which particular aspects of democracy link up with economic performance. We know that municipio mayors, state governors, and the administrators they appoint have the responsibility to allocate certain public services, and at the micro level, we are able to observe how these services affect economic performance and how they are themselves influenced by the voting behavior of constituents. Voting behavior is also much easier to quantify than subjective perceptions of the extent of political rights across countries, which form the basis for country-level

democracy indices. Finally, it is easier to characterize the evolution of municipio incomes using an econometric model than it is to explain cross-country differences in GDP growth. This is because we have detailed information on both the products that form the basis of a particular municipio's economy and the on movements in the prices of those products. State fixed effects can also better characterize weather or externally induced regional shocks that worldwide region dummies in the cross-country setting would not be able to capture.

Although the focus of the paper has been politics and growth, the analysis contributes to the more general empirical and theoretical growth literature. We present some evidence on other growth-relevant variables of interest to economists, including income inequality, inflation, and ethnic and religious composition of the population. However, this evidence has to be evaluated more carefully since there are difficult identification issues involved. This could be the topic of further research.

References

- Alesina, Alberto, Reza Baqir and William Easterly (1999). "Public Goods and Ethnic Divisions," *Quarterly Journal of Economics* 114: 1243-1284.
- Alves, Denisard and Christopher Timmins (2000). "Social Exclusion and the Two-Tiered Healthcare System of Brazil," FIPE and Yale University Working Paper.
- Andrade, Thompson and Rodrigo Serra (1999). "Estimativas para o Produto Interno Bruto dos Municipios Brasileiros: 1975, 1980, 1985 e 1996," mimeo.
- Barro, Robert (1995). "Inflation and Economic Growth". NBER Working Paper 5326.
- Barro, Robert (1999). "Determinants of Democracy," *Journal of Political Economy* 107(6): S158-S183.
- Betancourt, Roger and Suzanne Gleason (2000). "The Allocation of Publicly-Provided Goods to Rural Households in India: On Some Consequences of Caste, Religion and Democracy," *World Development*, December.
- Bound, John, D. Jaeger and R. Baker (1995). "Problems with Instrumental Variables Estimation When the Correlation Between the Instruments and the Endogenous Explanatory Variable is Weak," *Journal of the American Statistical Association* 90 (430): 443-450.
- Brock, William and Steven Durlauf (2000). "Growth Economics and Reality," mimeo University of Wisconsin.
- Brunetti, Aymo (1997). "Political Variables in Cross-Country Growth Analysis," *Journal of Economic Surveys* 11(2): 163-190.
- Caselli, Francesco, G. Esquivel and F. Lefort (1996). "Reopening the Convergence Debate: A New Look at Cross-Country Growth Empirics," *Journal of Economic Growth* 1: 363-389.
- Duflo, Esther and Abhijeet Banerjee (2000). "Inequality and Growth: What Can the Data Say?" MIT Department of Economics Working Paper.
- Durlauf, Steven (2001). "Manifesto for a Growth Econometrics," *Journal of Econometrics* 10: 65-69.
- Easterly, William and Ross Levine (1997). "Africa's Growth Tragedy: Policies and Ethnic Divisions," *Quarterly Journal of Economics* 112: 1203-1250.

Fleischer, David (1995). "Brazilian Politics: Structures, Elections, Parties and Political Groups (1985-1995)," Working Paper WP95-2, George Washington University Center for Latin American Issues.

IPEA (2001). "Produto Interno Bruto dos Municipios Brasileiros: 1970, 1975, 1980, 1985, 1990 e 1996," mimeo.

Kingstone, Peter and Timothy Power (2000). *Democratic Brazil: Actors, Institutions, and Processes*, Pittsburgh: University of Pittsburgh Press.

Miguel, Edward (2001). "Ethnic Diversity and School Funding in Kenya," UC-Berkeley CIDER Working Paper C01-119.

Mobarak, Ahmed Mushfiq (2001). "Why Democracies are More Stable: Models of Policy Choice and Political Conflict," mimeo, University of Maryland.

Tavares, Jose and Romain Wacziarg (2000). "How Democracy Affects Growth," forthcoming *European Economic Review*.

Figure 1.
State and Municipio Boundaries, and Cities where Price Survey is Conducted

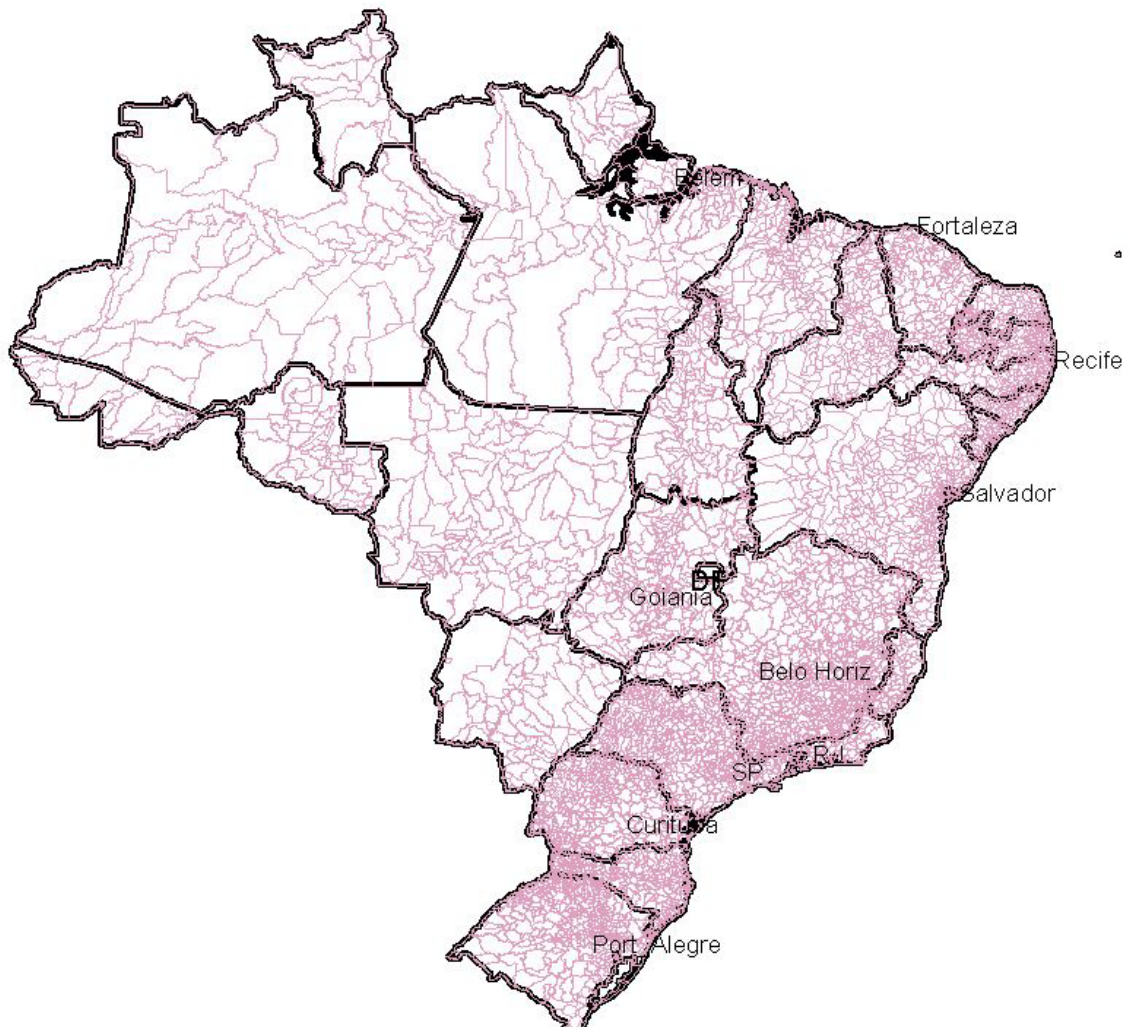


Table 1. Summary Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Growth of GDP per capita (1990-96)	4266	0.466	0.640	-0.881	4.727
GDP per capita 1990 / \$ 1000	4266	2.328	2.693	0.082	92.583
Schooling	4266	0.276	0.056	0.069	0.896
Urban Fraction of Population	4246	0.528	0.224	0.022	1.000
State Capital Indicator	4266	0.001	0.027	0	1
Major Metro Area Indicator	4266	0.036	0.185	0	1
Political Participation	4251	0.527	0.118	0.107	1
Schools per Thousand	4266	3.207	2.017	0.228	18.853
Density of Voting Locations	4255	0.039	0.072	0.000	2.316
Electronic Voting Availability Indicator	4266	0.002	0.043	0	1.000
Lack of Political Competition	4255	0.428	0.099	0.000	0.877
Ethnic Fractionalization Index	4265	0.392	0.137	0.000	0.660
Indigenous Population Fraction	4265	0.003	0.024	0.000	0.743
Religious Fractionalization Index	4265	0.191	0.127	0.000	0.698
Non-Christian Pop. Fraction	4265	0.001	0.003	0.000	0.052
Gini Coefficient of Income	4265	0.541	0.064	0.316	0.839
Services Share of GDP	4266	0.424	0.189	0.001	0.967
Industrial Share of GDP	4266	0.172	0.178	0.000	0.975
Yearly Inflation	4266	228.853	0.895	227.513	230.204
Std. Dev. Of Monthly Inflation	4266	7.467	0.148	7.226	7.840
Crop Production and Price Movements					
Coffee Production / GDP	4266	0.014	0.054	0	0.836
Coffee Price Inflation * Production	4266	0.004	0.013	0	0.207
Beans Production / GDP	4266	0.012	0.033	0	0.699
Beans Price Inflation * Production	4266	0.003	0.008	0	0.168
Banana Production / GDP	4266	0.004	0.016	0	0.409
Banana Price Inflation * Production	4266	0.001	0.004	0	0.103
Sugarcane Production / GDP	4266	0.027	0.103	0	3.641
Sugarcane Price Inflation * Production	4266	0.006	0.024	0	0.856
Maize Production / GDP	4266	0.022	0.036	0	0.516
Maize Price Inflation * Production	4266	0.005	0.009	0	0.123
Cassava Production / GDP	4266	0.017	0.051	0	1.485
Cassava Price Inflation * Production	4266	0.004	0.012	0	0.363
Orange Production / GDP	4266	0.438	2.639	0	73.423

Table 1. Summary Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
State Dummies					
Alagoas	4266	0.020	0.141	0	1
Amazonas	4266	0.014	0.119	0	1
Amapa	4266	0.002	0.046	0	1
Bahia	4266	0.088	0.283	0	1
Ceara	4266	0.040	0.196	0	1
Espirito Santo	4266	0.015	0.123	0	1
Goias	4266	0.048	0.214	0	1
Maranhao	4266	0.030	0.171	0	1
Minas Gerais	4266	0.165	0.371	0	1
Mato Grosso Do Sul	4266	0.017	0.128	0	1
MatoGrosso	4266	0.021	0.145	0	1
Para	4266	0.023	0.150	0	1
Paraiba	4266	0.032	0.176	0	1
Pernambuco	4266	0.038	0.191	0	1
Piaui	4266	0.027	0.161	0	1
Parana	4266	0.075	0.263	0	1
Rio de Janeiro	4266	0.014	0.117	0	1
Rio Grande do Norte	4266	0.034	0.181	0	1
Rondonia	4266	0.005	0.072	0	1
Roraima	4266	0.002	0.040	0	1
Rio Grande do Sul	4266	0.077	0.266	0	1
Santa Catarina	4266	0.050	0.218	0	1
Sergipe	4266	0.017	0.130	0	1
Sao Paulo	4266	0.127	0.333	0	1
Tocantins	4266	0.018	0.131	0	1

Table 2. Growth Regressions

	(2a)	(2b)	(2c)	(2d)	(2e)
	Growth of GDP per Capita 1990-96				Political Participation
	OLS	OLS	OLS	2SLS	
GDP per Capita 1990 / \$1000	-0.064 (16.78)***	-0.059 (15.47)***	-0.059 (15.47)***	-0.063 (15.49)***	0.002 (4.17)***
Political Participation	0.350 (2.76)***	0.321 (2.50)**	0.280 (2.17)**	2.438 (4.05)***	
Lack of Political Competition (Concentration Index of Vote Shares)	0.386 (3.04)***	0.332 (2.63)***	0.363 (2.67)***	0.110 (0.75)	0.104 (7.05)***
Ethnic Fractionalization 1991	0.127 (1.46)	0.172 (1.98)**	0.172 (1.97)**	0.201 (2.22)**	-0.012 (1.21)
% of Population that is Indigenous	-0.132 (0.32)	-0.360 (0.88)	-0.340 (0.84)	0.012 (0.03)	-0.186 (3.99)***
Religious Fractionalization	-0.379 (4.30)***	-0.232 (2.59)***	-0.242 (2.73)***	-0.114 (1.17)	-0.049 (4.72)***
% Non-Christians (Jews and Oriental Religions)	-3.105 (0.86)	-1.751 (0.49)	-1.230 (0.34)	-1.368 (0.37)	0.044 (0.10)
Gini Coefficient of Income	-1.258 (8.08)***	-1.038 (6.48)***	-1.047 (6.60)***	-1.113 (6.72)***	0.075 (4.15)***
Tertiary Sector as Share of GDP	-0.645 (11.39)***	-0.461 (7.60)***	-0.461 (7.66)***	-0.475 (7.66)***	0.038 (4.58)***
Industrial Sector as Share of GDP	-0.564 (8.93)***	-0.291 (4.17)***	-0.301 (4.37)***	-0.218 (2.91)***	
Average Yearly Inflation during 1991-1995	-0.069 (2.92)***	-0.064 (2.74)***	-0.065 (2.78)***	-0.079 (3.22)***	
Average Std. Dev. of Monthly Inflation during 1991-1995	-0.089 (0.59)	-0.195 (1.31)	-0.195 (1.31)	-0.132 (0.85)	
Fraction of Population Enrolled in School		0.630 (3.28)***	0.631 (3.28)***	0.065 (0.26)	0.140 (6.25)***
Urban Population as a Fraction of Total 1991		-0.548 (9.38)***	-0.551 (9.56)***	-0.583 (9.75)***	0.064 (8.84)***
Dummy for Major Metropolitan Region		0.007 (0.12)			-0.033 (4.98)***
Dummy for State Capitals		0.123 (0.36)			0.007 (0.14)
No. of Voting Locations per km2					0.082 (3.64)***
Dummy for Electronic Voting Availability					-0.033 (0.98)
Primary Sector as Share of GDP					0.027 (3.43)***
Public Schools per 1000 people					12.767 (16.90)***
=1 if State Governor From Same Party as Municipio Mayor			-0.014 (0.46)		
Vote Share of Leftist Party candidates			-0.550 (2.75)***		
Vote Share of Winning Coalition in 1994 Presidential Elections			-0.181 (1.73)*		

Table 2. Growth Regressions

	(2a)	(2b)	(2c)	(2d)	(2e)
	Growth of GDP per Capita 1990-96				Political Participation
	OLS	OLS	OLS	2SLS	
Coffee Production / GDP	-97.114 (2.59)***	-89.857 (2.42)**	-87.469 (2.36)**	-71.724 (1.86)*	
Avg Monthly Increase in Coffee Price * (Coffee Production / GDP)	392.301 (2.58)***	362.696 (2.41)**	353.115 (2.35)**	289.581 (1.85)*	
Beans Production / GDP	-83.113 (2.09)**	-84.917 (2.15)**	-86.604 (2.19)**	-65.851 (1.60)	
Avg Monthly Increase in Beans Price * (Beans Production / GDP)	341.946 (2.06)**	348.761 (2.12)**	355.995 (2.17)**	269.984 (1.58)	
Banana Production / GDP	10.196 (0.48)	1.590 (0.08)	-0.515 (0.02)	7.980 (0.36)	
Avg Monthly Increase in Banana Price * (Banana Production / GDP)	-58.632 (0.67)	-24.469 (0.28)	-15.967 (0.18)	-49.222 (0.54)	
Sugarcane Production / GDP	-41.979 (3.66)***	-40.650 (3.57)***	-39.308 (3.46)***	-35.441 (3.00)***	
Avg Monthly Increase in Sugarcane Price * (Sugarcane Production / GDP)	176.233 (3.59)***	170.902 (3.51)***	165.193 (3.40)***	148.855 (2.94)***	
Maize Production / GDP	-27.383 (1.93)*	-22.477 (1.60)	-22.335 (1.58)	-25.367 (1.74)*	
Avg Monthly Increase in Maize Price * (Maize Production / GDP)	111.598 (1.85)*	90.117 (1.50)	89.049 (1.48)	101.279 (1.64)	
Cassava Production / GDP	-23.518 (2.10)**	-34.474 (3.08)***	-33.345 (2.99)***	-23.967 (2.02)**	
Avg Monthly Increase in Cassava Price * (Cassava Production / GDP)	95.626 (2.06)**	140.368 (3.04)***	135.766 (2.94)***	97.383 (1.99)**	
Orange Production / GDP	-0.020 (5.67)***	-0.018 (5.29)***	-0.019 (5.31)***	-0.017 (4.73)***	
Constant	17.745 (3.14)***	17.338 (3.07)***	17.778 (3.16)***	19.702 (3.37)***	0.189 (10.08)***
State Dummies	Yes	Yes	Yes	Yes	Yes
Observations	4255	4235	4232	4235	4373
R-squared	0.21	0.23	0.23	0.18	0.60
F-test of instruments (3, 4180)					70.70 (p<0.00)

Absolute value of t statistics in parentheses

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

Coefficients for State Dummies not reported

Table 3. Provision of Public Services (per 1000 people)

	Teachers		Doctors		Clinics	
	(3a) OLS	(3b) 2SLS	(3c) OLS	(3d) 2SLS	(3e) OLS	(3f) 2SLS
Private Provision	-0.449 (13.46)***	-0.318 (4.76)***	-0.056 (0.58)	-0.305 (1.37)	0.378 (3.41)***	0.500 (2.13)**
Municipio Average Household Income	5.700 (6.86)***	-4.65 (1.09)	-0.000 (4.01)***	0.000 (0.99)	-1.25 (7.27)***	-1.66 (2.31)**
Gini Coefficient of Income	2.032 (6.32)***	3.414 (4.10)***	1.047 (7.10)***	-0.007 (0.01)	0.243 (3.69)***	0.284 (2.14)**
% of Population Living in Slums (Improvised Housing)	-6.859 (4.03)***	-22.499 (2.41)**	0.036 (0.05)	13.506 (2.60)***	-0.159 (0.46)	-0.875 (0.59)
Migrants as a Fraction of Total Population	2.218 (5.41)***	21.686 (2.17)**	-0.463 (2.46)**	-13.796 (2.50)**	0.187 (2.21)**	1.032 (0.64)
Political Participation	3.696 (15.82)***	4.162 (2.19)**	1.296 (12.10)***	5.640 (5.27)***	0.696 (14.51)***	0.630 (2.05)**
Lack of Political Competition	1.528 (9.42)***	1.123 (2.48)**	0.500 (6.72)***	1.254 (4.93)***	0.170 (5.11)***	0.148 (2.05)**
=1 if State Governor Elected in 1994 from Same Party as Municipio Mayor	-0.023 (0.28)	-0.025 (0.20)	-0.178 (4.78)***	-0.029 (0.40)	-0.005 (0.29)	-0.008 (0.43)
Vote Share for Left-Party Candidate	-0.437 (3.60)***	-0.072 (0.41)	0.033 (0.59)	0.122 (1.16)	-0.002 (0.10)	0.008 (0.28)
% of Municipio Population Living in Urban Areas	0.621 (5.61)***	-0.237 (0.59)	-0.133 (2.62)***	0.314 (1.41)	-0.271 (11.92)***	-0.306 (4.64)***
Dummy for Major Metropolitan Region	-0.569 (5.37)***	-0.865 (3.60)***	0.062 (1.28)	0.388 (2.78)***	-0.037 (1.70)*	-0.054 (1.32)
Dummy for State Capitals	0.336 (1.28)	0.932 (2.36)**	0.084 (0.70)	-0.084 (0.36)	-0.005 (0.10)	0.013 (0.21)
Population Density	-7.050 (1.77)*	10.31 (1.17)	-0.000 (0.91)	-0.000 (1.84)*	-0.048 (0.57)	0.013 (0.09)
Ethnic Fractionalization 1991	0.023 (0.15)	-0.376 (0.90)	0.161 (2.35)**	0.835 (3.50)***	0.129 (4.21)***	0.102 (1.47)
% of Population that is Indigenous	-0.405 (0.52)	-0.351 (0.32)	-0.696 (1.94)*	0.474 (0.72)	0.295 (1.84)*	0.291 (1.61)
Religious Fractionalization	0.382 (2.28)**	-0.548 (0.79)	0.157 (2.04)**	1.258 (3.24)***	0.027 (0.80)	-0.015 (0.14)
% Non-Christians (Jews and Oriental Religions)	32.166 (4.56)***	40.539 (4.42)***	-3.282 (1.01)	-0.209 (0.04)	-3.504 (2.42)**	-3.225 (2.12)**
Constant	-3.708 (13.99)***	-4.435 (3.11)***	-1.099 (9.06)***	-4.397 (5.42)***	-0.228 (4.20)***	-0.181 (0.77)
Observations	3941	3927	3941	3927	3941	3927
R-squared	0.24		0.08		0.15	

Absolute value of t statistics in parentheses; * significant at 10%; ** significant at 5%; *** significant at 1%