

Summary for the policymaker

Following a coup d'etat and the subsequent 21-year military dictatorship in 1960s Brazil, Ferraz et al. study the long-term effects on economic development of two policies implemented at the beginning of the takeover designed to reduce elite control of municipal politics. Electoral reforms implemented by the dictatorship were designed to inhibit familial control of municipal level political offices to halt the inefficiencies of oligarchies in the agricultural industry. As well as Economic reforms in the form of subsidized credit to farms was administered by the dictatorship to spur competition in the agricultural industry and usher in a new class of economic elites. The military dictatorship, among other things, had an ultimate goal of modernizing the agricultural industry and saw the traditional elites as an obstacle towards building a strong national state necessary for economic development.

Upon takeover of the dictatorship in 1964, electoral reforms were implemented by inserting new local politicians, who were loyal to the military, in municipal elections to compete against the traditional elites. To ensure change of political control in the municipalities, the dictatorship replaced the multiparty political system with a 2-party system which forced politicians to choose between a pro-government party (ARENA) or an opposition party (MDB). To avoid losing the elections by having local elites run as opposition candidates, they created an electoral system called *sublegenda* which allowed multiple candidates to run for office under the same party, accommodating both the traditional elites and military loyalists. A candidate could win the election by receiving the most votes relative to same party candidates as well as being affiliated with the most voted for party.

The authors find that, as expected, the *sublegenda* system was used more often in areas that were initially more politically concentrated, in-line with the goals of the military dictatorship to reduce monopoly power of the elites. The new electoral system was found to increase political competition over time and improve governance, consequently the changes led to increased provision of local goods and an increase of income per capita in the municipalities which underwent the most significant shift away from traditional elite control.

In addition to electoral reform, the military dictatorship also intervened in the agriculture industry, providing subsidized credit and provision of agricultural inputs to farms, and investing in infrastructure such as roads to modernize the industry. Through these interventions, the dictatorship supported a new class of agricultural producers who were found to pose a direct challenge to the traditional elite controlled farming business. Results indicated that more politically concentrated regions prior to the dictatorship received relatively more credit, consistent with expectations given rural regions tend to be more politically concentrated historically. Throughout the period of study, there was an increase in number of farms in the targeted regions.

The authors exploit the military dictatorship takeover to observe long term effects of change in political power on economic development. Their hypothesis is that the policies enacted by the dictatorship in 1964 had long-term effects on political power at the local level. Furthermore, they argue that the increase in political competition had a direct effect on long term economic development in the regions which underwent the greatest shift in distribution of political power.

Evaluation of external validity for policymaker

There are three characteristics of a polity which must be satisfied before evaluating the external validity of the authors findings. First, the status of democratic institutions at the municipal level; there must be citizen participation in municipal elections to determine who becomes mayor of a municipality. Second, there must be a degree of local government autonomy, the findings would not be applicable to regions with no local rule. Third, the influence of local rulers on industry should be considerable, any natural resource based industry is relevant for comparison, however there must be a degree of control over the industry by local politicians for external validity to be credible.

If the preceding requirements are satisfied, external validity may apply, as there is a compatible institutional framework for implementation of the same policies to spur political competition. However, fourth and fifth requirements may be necessary for external validity. The existence of dynastic control of municipal politics, and oligopolies in local industry which have created observable economic inefficiencies. Although the researcher's findings provide compelling evidence that benefits of political competition can be realized when only the first three requirements are met.

The researcher's conclusions and external validity considerations above beg the question of whether their results would apply to developed countries even despite strong electoral institutions. While most developed countries have a variety of institutions to combat corruption and foster competition in their industries, no country is exempt from political corruption and anti-competitive behaviours in industry. However, democratic developed countries often have well enforced electoral institutions in place which prevent officeholders from utilizing their power for private business interests and often have thorough auditing institutions which provide a powerful check on various forms of corruption at all levels of government.

Therefore, the likely scenario to which external validity would apply is countries with electoral institutions which are more susceptible to influence from elites with local networks of control over industry, due to weaker or non-existing regulatory and auditing institutions designed to combat corruption. In practice, the circumstances leading to a valid external application of the authors findings would likely be found in developing countries with weak systems of governance.

Summary of the identification strategy for an economist

The identification strategy used is a causal chain of reasoning, where OLS regressions are applied to inspect each stage of change in political concentration leading to the outcome of

interest. The strategy requires an objective analysis of the empirical evidence leading to a well-grounded conclusion. In practice, the authors analyze the channels through which the military dictatorship implemented change in political competition and characteristics of the municipalities of where the greatest shift in political concentration took place to understand the various influences on their outcome of interest and reveal the distinct effect of the military dictatorship's policies to reduce elite control.

The authors have a dataset with surnames of municipal election candidates from 3 states, during the period 1940 to 2000. A Herfindahl index is constructed to determine the magnitude of traditional elite dynastic control during each of the pre-dictatorship, dictatorship, and post-dictatorship periods. The index is an accurate measure of familial power consolidation over the each of the three periods.

Starting with an analysis of the summary data, the researchers find higher local dynastic concentration is positively correlated with less economic development at the municipality level. These areas tend to be rural, less populated, and more reliant on agricultural production of crops, which is consistent with historical accounts of low developed areas in Brazil.

The authors base their estimating equations on the same control variables and state level fixed effects while swapping dependent and independent variables of interest for each stage of their causal chain of reasoning. Using OLS regressions, the authors use various specifications to disentangle the effect of increased political competition on economic growth without subjecting the economic growth outcome variables to influence from other factors. Their primary method to achieve this is adding additional independent control variables to the estimating equation. The authors also employ state level fixed effects, to ensure their observed results do not include any factors that may have been inherent to the states that the municipalities were located in, such as an improved healthcare policy during the observation period.

To begin the causal chain of analysis, the authors find that political concentration is negatively correlated with a proxy for 1940 income per capita pre dictatorship, interestingly the trend reverses when measuring political concentration pre dictatorship against per capita income levels in 2000. As mentioned above, the authors note that electoral and economic reforms may have been targeted more by the dictatorship in areas which were thought to have stronger elite control. They also found that in municipalities with less elite control there were higher rental prices, effectively agricultural income, than in municipalities with more elite political concentration. This relationship that the authors are evaluating is critical to understand why certain areas may have benefitted more from increased political competition than others.

Furthermore, the authors run another set of regressions using their ideal specifications from the previous set, on a sample of their data with additional control availability, to continue checking for robustness. The authors now evaluate the mechanism by which the military dictatorship installed their electoral reform, and its efficacy in reducing the political power of

traditional elites. The authors examine the *sublegenda* system by testing whether there was an association with pre dictatorship political concentration and adoption of the *sublegenda* system for two years when all municipalities had elections, to ensure results which encompassed the effect of adopting the *sublegenda* or not. By using the same baseline controls and state level fixed effects as before, and using an indicator for whether or not the winning mayor was running within a *sublegenda* as their dependent variable, the authors were able to find evidence supporting their hypothesis that the *sublegenda* system was more present in municipalities with greater political concentration. In particular, the authors find that the presence of the *sublegenda* voting systems encouraged greater vote shares to the ARENA party compared to municipalities without a *sublegenda*, supporting the hypothesis that the *sublegenda* system fostered political competition between traditional elites and new candidates.

When the authors focus on a single election to investigate the composition of candidate's elite status, they find great evidence in support of the hypothesis that the *sublegenda* spurred political competition. They observe that across all elections, there was a significant negative relationship between political concentration pre dictatorship and all-traditional-elite election candidates post election. In support of their previous finding, that the *sublegenda* system was focussed primarily on municipalities with greater traditional elite control, this result further supports their hypothesis that the electoral reform promoted political competition and effectively reduced traditional elite control.

The authors last step in the causal chain was to debunk the idea that it was agricultural modernization rather than increased political competition that was responsible for the long run economic growth seen in the more politically concentrated municipalities. To test the counter argument, the authors regress measures of agricultural modernization on their estimating equation with all previous control variables and state fixed effects. They find that modernization was not sufficiently affected by greater levels of political concentration pre dictatorship.

To finalize their analysis of the counter argument, the authors estimate the effect of the level of pre dictatorship political concentration, on income per capita in 2000 for each municipality while using the same base line controls and state fixed effects, but adding additional independent variables to capture the effect of agricultural modernization. They find that the outcome variable of interest, income per capita in 2000, remains large and statistically significant and therefore conclude that agricultural modernization does not seem to be an alternative mechanism for their main result.

Evaluation of identification strategy for economist

At first glance, the data for an individual municipality indicates that during the 3 observation periods, pre dictatorship, dictatorship, and post dictatorship, there becomes a greater dispersion of familial affiliations among elected mayors. However, the data is not yet extensive, for a typical municipality they have election outcome data from 4 elections pre electoral reform

and 9 elections post electoral reform to base a relative before/after political concentration index off. However, the authors construct a panel data set across all municipalities with available data in the 3 states, a final compilation of approximately 1000 total elections observed for 13 of the observation years. Other years were significantly lower due to alternating electoral periods, although every year from 1940-2000 had election observations, ranging from about 10 to 300 in the alternate years.

The primary concern that the authors express with their identification strategy is that development gains of politically concentrated areas may have been due to modernization of the agricultural industry as opposed to an increase in political competition. Referring to the goals of the regime, “it entailed gaining a degree of control over labor, land, and capital in the countryside ... It sought to centralize authority out of the hands of the oligarchies by enacting new legislation and created new bureaucratic machinery in rural areas to circumvent existing state and local governments.” (Houtzager, 1998)

To support their argument, the researchers estimate whether it is true that government credit was targeted more in areas with greater political concentration. By using the same estimating equation, baseline controls, and state level fixed effects as before, then swapping out a dependent variable of credit per farm in the municipality of observation, the authors find that there was a 43% increase in government credit for municipalities with 1 family in power pre dictatorship compared to municipalities with 3 families in power for the same period, however they do not find similar or significant results for private credit, showing demand for credit was not reflective of credit received.

However, the authors believe this an unlikely to determinant of their outcome for two main reasons, modernization of the agriculture sector was not correlated with initial political concentration, meaning the authors can observe separate causal events of economic development for the set of municipalities with initially high levels of political concentration, and a separate set of causal events resulting in economic development due to agriculture modernization. The authors also find reversal in income levels are robust when controlling for changes in sectoral composition and agricultural inputs.

Another concern of the authors identification strategy regarding the construction of the Herfindahl index, is that familial lineage may not be the only possible characteristic of elite control and the negative externalities of oligopolies. It is possible the authors identification strategy of surname's as an indicator of political concentration is insufficient to properly identify corruption.