

# **Punctuated Equilibrium in Public Budgeting in Authoritarian and Democratic Brazil**

Beatriz Rey\*  
Derek A. Epp\*\*  
Frank R. Baumgartner\*\*\*

## **Abstract**

We explore punctuated equilibrium in public budgets with a focus on Brazil before and after its transition to democracy. Empirical evidence in this area has largely been limited to western democracies, but the differences between authoritarian and democratic regime types suggest important research questions. Our data on Brazil suggest a modest shift from higher to lower kurtosis in budget distributions with the transition to democracy. We interpret that to be related to the greater information-processing capabilities of a democratic regime as well as its greater range of diverse priorities. However, we suggest as well that future research needs to gather much more data on a wider range of countries. We show how this might begin with a review of data available for 26 OECD countries, suggesting great variability among them in budgetary kurtosis, but call for more data collection in non-democratic regimes as the most fruitful research plan going forward.

Keywords: authoritarianism, punctuated equilibrium, Brazil, budgeting

\* Rey is a Ph.D. student in Political Science at Syracuse University; bpolicic@syr.edu.

\*\* Epp is a Ph.D. student in Political Science at the University of North Carolina at Chapel Hill; derekepp@email.unc.edu.

\*\*\* Baumgartner is the Richard J. Richardson Distinguished Professor of Political Science at the University of North Carolina at Chapel Hill; Frankb@unc.edu.

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Punctuated equilibrium theory (PET) describes how as a consequence of disproportionate information processing public policies change in a series of fits and starts, alternating between long periods of stasis where negative feedback forces maintain the status quo and brief, but dramatic, periods of change. While the theory accurately describes a broad range of policy activities, studies of PET have looked almost exclusively at Western democracies, where the wide availability of public budgets and other policy indicators facilitate longitudinal analysis. For example, the 2009 article “A General Empirical Law of Public Budgets,” focused only on European and North American democracies.

We test PET across different political regimes and suggest a research strategy for expanding on this idea. First, in the context of authoritarianism and democracy by analyzing public budgeting in Brazil from 1964 to 2010. We propose that authoritarian regimes are worse at gathering, processing, and responding to information about societal problems than democracies because they have fewer independent sources of information, and indeed they may suppress certain kinds of information or have highly focused policy priorities. These characteristics may be partially counter-balanced by a greater ability to react to changing circumstances, given the lack of institutional constraints such as generating a super-majority or even a regular majority in a democratically elected and independent legislature. The relative advantage that democratic regimes with a free system of the press and active social mobilizations have with regards to signal detection and problem recognition are poorly understood. Indeed, we know of no research that systematically compares authoritarian and democratic regimes with regards to these issues, so we push forward a new research idea here. We expect that public budgeting will exhibit greater levels of punctuation in Brazil during periods of authoritarianism as compared to under democratic rule. Indeed, our evidence points strongly in this direction.

We then move to a consideration of a research approach to test these ideas. We show the feasibility of testing levels of punctuation based on the tentative beginnings of such an approach offered by Jones et al. (2009) in which the authors compared LK scores (a measure of the degree of punctuation in a budget) across the seven countries in their study with a measure of “institutional friction” based on the number of “veto players” and institutional hurdles to policy change. They found that the UK, with its low-friction Westminster system, was significantly lower in kurtosis than such countries as the US or Belgium which had much higher levels of institutional friction. However, based on only seven observations, all being democracies, that finding was only tentative. A research approach that would incorporate wider range of systems showing much greater variability in institutional design, indeed moving from full dictatorships to full democracies with many veto players, would offer much greater analytical power. We give examples of how this might be done.

Our dataset for Brazil is comprised of all available authorized budgets extracted from the Institute of Geography and Statistics (IBGE) and the Budgetary Law (Lei Orçamentária Anual, LOA) from 1964 to 1985 and from 1995 to 2010. The periods of analysis cover the years of authoritarian rule (1964 to 1985), and, in the democratic period, the years of center-wing party rule (1995 to 2002) and the years of left-wing party rule (2003 to 2010). Public budgets from 1986 to 1994 are unavailable due to issues of data reliability. The total number of observations is over 1,500. To our knowledge the dataset assembled here is the longest and most accurate account of budgeting in Brazil publicly available. Empirical tests are straightforward. We draw distributions of percent changes in spending for the authoritarian and democratic periods. Comparison shows that authoritarianism is associated with a greater tendency for both incremental change and dramatic punctuation.

Our contribution is to push PET forward by looking at the impact of institutional forms on patterns of budget reallocations. For all the regimes we examine there is a combination of policy stability and punctuations, implying that the distinction between authoritarianism and democracy (or different forms of democracy) is not fundamental for understanding budget allocations. The levels of punctuation observed differ substantially however. Theoretically we would expect democracies to have greater informational capacity than other political regimes and this idea finds support in the data. Policy instability can be added to the long list of attributes that favor democratic governance over its alternatives.

## **Background**

Baumgartner and Jones developed PET in 1993 through in-depth case studies of particular policy issues, such as nuclear energy and pesticide use. They found that policy changes in these areas were predominately incremental, but that occasionally radically new ideas would gain momentum causing a tidal shift in budgetary commitments toward these issues. In later work (2005) they introduced a more generalized methodology to demonstrate that government policymaking is a fundamentally erratic process; characterized by long periods of equilibrium that are intermittently punctuated by dramatic changes. Their argument was this: Because policymakers are boundedly rational and the processing capacity of political institutions is constrained by rules, governments are disproportionate processors of information. The effects on policy change are two-fold. On one hand, an extreme allegiance to the status quo is built into the system. If attention is scarce, most issues most of the time will be ignored and it is difficult to justify changing the status quo in the absence of attention. But issues cannot be ignored indefinitely; societal problems that are typically ignored will grow worse over time and eventually need to be addressed. When an issue finally receives attention, policymakers may be

forced to enact dramatic policy changes, if only to catch up for the lack of moderate adjustments they failed to make as the problem slowly developed. Thus the model describes a system characterized by friction, where negative feedback forces are predominate, but occasionally give way to periods of rapid self-reinforcing change. With policymakers responding only to a limited number of urgent problems at any given time, issues beneath a threshold level of urgency are simply put on the back burner as attention is focused on the most pressing issues; there are always more issues that deserve attention than time to attend to them.

Disproportionate information processing has empirical implications. Padgett demonstrated in 1980 that the incremental model of budgeting (Wildavsky 1964) implied that changes in government policy would be normally distributed. If the inputs relevant to governing are stochastic and independent then policies based on an unbiased aggregation of these inputs would from the Central Limit Theorem result in a normal distribution. PET suggests that because governments are disproportionate processors of information the input aggregate process is far from unbiased. Instead some inputs become entrenched and received intense scrutiny, while many others are routinely ignored. Occasionally this balance is upset and inputs that were previously considered trivial are reprioritized as important indicators of some underlying social problem. Thus PET theory predicts that policy changes will fall into one of two categories: incremental when the status quo prevails, and dramatic during rare periods of imbalance.

Empirical support for this prediction is substantial. A long line of scholarship finds that distributions of changes in public budgets display a punctuated equilibrium pattern, characterized by high central peaks, “weak shoulders,” and very long tails (Jones, Sulkin, and Larsen 2003; Jones and Baumgartner 2005; Breunig and Koski 2006; Baumgartner et.al. 2009; Jones et.al. 2009; Breunig, Koski, and Mortensen 2010; Robinson et.al. 2014). This research focuses on

kurtosis, a summary statistic that measures the peakedness of a distribution. Higher kurtosis is generally taken as evidence of greater friction in the policy process that produced the given change distribution.

To date, Lam and Chan (2014) have conducted the only test of the PET in the context of nondemocracies. (Pauw (2007) also demonstrated that South African budgets showed high levels of kurtosis, based on an analysis of program-level budget data from 2003 through 2010.) Looking at the case of Hong Kong, Lam and Chan propose that nondemocracies are characterized by greater friction than democracies because the constitutional design of these regimes centralizes power at the highest level of government, blocking out external interferences to political processes. According to them, in the absence of electoral and participative mechanisms that are characteristic of democratic governments, officials lack the incentive to monitor and respond to the external environment. Of course, one could also note that the non-democratic regimes face few constraints once they decide to reallocate resources: there is no requirement to bargain with an independent legislature, rival parties, or other veto players who may stand in the way of smooth adjustment to shifting needs. Thus, one could potentially argue that the merit of authoritarianism is in giving full control to the executive to respond to shifting social issues as needed. On the other hand, informational capacity is typically reduced.

Within such a system, Lam and Chan argue, under-response or stasis is extended; changes are reduced to prolong stability through mechanisms of negative feedback. However, the authors predict that pressure for change can build up to dangerous levels; especially when it reaches levels high enough to threaten the authority of the regime. The result of the two dynamics is a highly punctuated policy process “in which the policymaking is too insulated to react until the built-up pressures can no longer be resisted. But once it happens, the policy

response can be radical and extremely forceful” (Lam and Chan 2014; 123). We join Lam and Chan in pushing forward to investigate patterns of public budgeting outside the context of advanced industrial democracies.

## **Hypotheses**

Democracies at a fundamental level are designed to translate citizen inputs into policy outputs.

This is most often achieved through the electoral connection: officer holders wishing to keep their jobs must legislate in accordance with their constituents’ political attitudes. Thus the onus is on policymakers to be active seekers and consumers of information. Lazy representatives who ignore the problems facing their constituents may soon be voted out of office.

Policymakers in authoritarian regimes do not have to answer to voters. This erodes the informational capacity of authoritarian governments on two fronts. First, it creates few incentives for leader to seek out information. Indeed, structures that facilitate the flow of information in democracies, such as freedoms of speech and press, are often missing in authoritarian regimes and information is frequently censored or manipulated in favor of the regime. Second, whatever information is received by policymakers can more easily be ignored. Autocrats who want to keep their jobs must act only when problems have grown to such an extent that unrest, either within the regime or society at large, appears eminent.

Another set of institutional features of democracies and authoritarian systems works potentially in another way. The autocrat controls the levers of government; the democratic leader may have to negotiate more compromises. So, whereas democratic leaders may get more signals and be more aware of changing social demands or trends, they may not have the capacity unilaterally to respond. An independent legislature, a judicial body, or members of rival parties sharing control of a coalition government may refuse to cooperate; in sum a democratic regime

typically has some institutional barriers to action, and these are usually much greater than what would exist in an autocracy.

In all, we propose that democracies operate with fewer frictions than other political regimes. Every government has a certain threshold of institutional response. Below the threshold policymakers ignore problems; above the threshold they attempt to solve them. We argue that because authoritarian regimes lack an electoral connection the response threshold is higher than in democracies. In democracies, problems can be safely ignored only until representatives worry that their constituents will vote them out of office. Policymakers in authoritarian regimes can ignore problems to the point at which social discontent threatens regime stability. Voting is much less costly than revolt, so in general we can expect democracies to be more responsive to information. Thus, we hypothesize:

*Public budgeting in democracies will show lower levels of kurtosis than other political regimes.*

Of course, not all authoritarian or democratic regimes are the same. Leaders of some authoritarian countries have grander ambitions than preventing revolt and may therefore be more responsive to information. Examples of authoritarian regimes that adopt democratic institutions to maintain power are abundant in the literature (Gandhi & Przeworski 2007, Brownlee 2007, Gandhi 2008, Magaloni 2008, Malesky & Schuler 2010; Brancati 2014). Furthermore, the electoral connection in democracies can be weakened by special interests, principal-agent problems, discriminatory voting laws, or entrenched incumbents. Our expectations are not absolute. Some authoritarian regimes may operate with fewer frictions than some democracies, but we expect the opposite will be true in the great majority of cases. More importantly, we hope to lay out the beginnings of a research program that would test whether the informational advantages of democracy outweigh some of the institutional powers of the autocrat in terms of



producing smooth adjustments to changing social or economic circumstances. This will demand much more data collection and testing than we do in this paper, so here we focus just on a simple comparison of pre- and post-democracy Brazil.

## **Data**

We introduce a new dataset: public budgets in Brazil from 1964 to 2010. Previous scholarship has focused almost exclusively on Western democracies because these countries make available longitudinal data. Using original source documents, we assemble budget data for Brazil during periods of both authoritarianism and democracy, allowing a unique test of PET theory. Before proceeding to results, we briefly review Brazilian politics and budgetary procedure during these two periods, and describe the data.

### *The Brazilian polity*

Our analysis focuses on the years of authoritarian rule (1964-1985), and, in the democratic period, the years of center party rule (PSDB, 1995-2002, during which the president was Fernando Henrique Cardoso) and the years of left party rule (Workers' Party, or the PT, 2003-2010, during which the president was Luiz Inácio Lula da Silva). We divide the Brazilian military regime into two periods. The first (1964-1974) was characterized by the dominance of the hard-liner group of military officers, economic prosperity and relative absence of social unrest. The second (1975-1985) was characterized by the dominance of the moderate group of military officers, economic crisis, and presence of social unrest.

The first period of the military regime was marked by the severe restriction of political and civil rights. The government interfered in almost all labor unions and civil society organizations, strikes were banned and student movements were declared to be extinct. Political rights were also suspended. The government established indirect elections for presidents and

governors. Only two political parties were allowed to exist: the Aliança Renovadora Nacional (ARENA), the regime party, and the Movimento Democrático Brasileiro (MDB), the opposition party. During this period, rulers temporarily shut down Congress in 1968 and edited the Institutional Act 5 (AI5), suspending all democratic rights and constitutional freedom. The economic crisis was quickly mitigated by the military regime. At that moment, economic growth, which was the consensus goal of the upper classes that formed the ruling coalition, was secured through the “economic miracle.” Not only was the ruling coalition united with the military rulers, but also there was a united military leadership with a clear vision.

During the second period of the military regime, Brazil’s economy started to suffer the effects of the oil shock of 1973 combined with the maintenance of investments in unfavorable conditions. Although the government tried to contain the crisis, a second oil shock (1979) jeopardized its plan. The annual rate of inflation did not stop growing during this period, which did not stop the Brazilian military regime from focusing on economic growth at all costs (Skidmore 1988). President João Figueiredo, the last military ruler to occupy office, turned to the IMF for assistance (Baer 2014) in 1982. Several sectors of society began to organize in this period (for instance, the “Diretas Já” movement demanded direct presidential elections between 1983 and 1984), which forced the government to promote some institutional reforms, such as the end of the censorship of radio and television.

The transition to democracy occurred in March 1985 when President José Sarney took office after the death of Tancredo Neves, who had been indirectly elected president by an electoral college. Fernando Collor de Mello was the first president elected by the people after the military regime. The Collor presidency, which began in 1990, did not last long – he was impeached in 1992 after being accused of condoning an influence peddling scheme.

From 1985 to 1994, Brazil had four different currencies (Cruzado, Cruzado Novo, Cruzeiro, and Cruzeiro Real). The country suffered with hyperinflation that reached levels as high as of 81.3% in a single month in 1990 (Bresser Pereira and Nakano 1991). When vice-president Itamar Franco took office in 1992, sociologist Fernando Henrique Cardoso became his finance minister. Responsible for the design and implementation of “Plano Real”, a plan that stabilized the Brazilian economy and introduced the Real as the country’s currency, Cardoso ran for presidency and was elected in 1995.

As president, he embraced austerity with great vigor,<sup>1</sup> especially after the world financial crises that started in Asia, hit Russia, and then Brazil between 1997 and 1999 (Skidmore et al. 2010). During the period of economic crisis, Cardoso was pressured by the IMF to make broad cuts in public spending and to raise taxes and interest rates once again. In order to support the Real, the Brazilian government signed an agreement in November 1998 with the IMF, the World Bank, and the U.S. government that provided the country with US\$ 41.5 billion.

The economic crises were gone by the time President Luiz Inácio Lula da Silva, from the Worker’s Party, took office in 2003, but he suffered substantial pressure from international financial circles to maintain the orthodox macroeconomic policies of the Cardoso administration – which he did. The Lula administration achieved satisfactory budget surplus in its first two years as required by the IMF, and paid off its debt in full with the organization by 2005, two years ahead of schedule (Skidmore et al. 2010). The commodities boom in the 2000s

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<sup>1</sup> Nevertheless, the Cardoso administration promoted a moderate push to strengthen elementary education and attempted to conduct pension and tax reforms. He also enacted policies in social assistance, such as the Bolsa Escola and the Comunidade Solidária, but the reach of these policies was not substantial (Huber and Stephens 2012).

strengthened the economy (Skidmore et al. 2010) and reduced economic constraints on policymaking (Huber and Stephens 2012).

### *The budgetary process*

The military government used constitutional amendments, institutional acts, and executive decrees to reduce in great depth the roles of the legislatures and the judiciary (Skidmore 1988). Particularly in the case of budgeting, the First Institutional Act, issued by General Arthur da Costa e Silva in 1964 before the nomination of General Humberto de Castello Branco as the first military president, established that the president would have exclusive power to propose expenditure bills to Congress, which could not increase any spending item (Skidmore 1988). Afterward, the Constitution of 1967 deliberately isolated legislators from decision-making in terms of budgeting. This pattern would be maintained until the end of the military regime.

The Constitution of 1988, approved three years after democratization, maintained strong presidential powers for Brazilian presidents that were inherited from the military regime (Alston et al. 2006). Presidents enjoy several prerogatives in policymaking, including the exclusive right to initiate new budgetary legislation. Every year, the budgetary law is drafted by the executive and referred to the congressional Budget Committee to be approved by legislators. Although the congressional majority has the right to amend the bill, it is the executive who determines which amendments are appropriated, since they have to be compatible with both a multi-year budget plan elaborated on by the executive as well as with a law on budgetary guidelines (Alston et al. 2006: 19-20). In other words, legislators do not have the power to authorize expenditures; they can only reallocate public investment after the executive has defined the priority areas. Rocha (2008) argues that even this reallocation power is restricted, and it was remarkably so during the periods of economic crises that took place during the 1990s.

## *Data*

Our dataset is comprised of the available authorized budget data reported by the IBGE from 1964 to 1985 and the authorized budget data reported in the Brazilian Budgetary Law (Lei Orçamentária Anual, LOA) from 1995 to 2010. The data have been converted into 2014 Reais (R\$)<sup>2</sup> and are listed by topic codes that cover the executive, legislative, and judicial branches and their subtopics. We rely on different sources of data because the Brazilian Institute of Geography and Statistics (IBGE) does not report the authorized budget, but the executed budget, from 2001 on. The IBGE and LOA data sets are nevertheless comparable, since both data sets report budget authority data. Table 1 shows the total number of observations and the average annual spending, divided by administration. This reveals the tremendous growth of the Brazilian government. Annual spending in the most recent period is over 100 times what was spent in the average year during the 1960s, after adjusting for inflation.

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<sup>2</sup> The formulas for monetary and inflation adjustment were calculated based on the dates of approval of the LOAs.

Table 1. Budget Data by Period

Administration	Years	Observations	Average Annual Spending
<b>Authoritarian</b>			
Period 1	1964-1974	318	21.29
Period 2	1975-1985	341	111.10
<b>Democratic</b>			
Cardoso	1995-2002	320	1,598.77
Lula	2003-2011	349	2,251.54
Total	1964-2011	1,328	686.36

Note: Data is missing between 1986 and 1994. Average annual spending is shown in billions of 2014 Reais.

We do not investigate public budgeting during the period in which Brazil was drafting its new constitution or the first years after democratization (1986 to 1994). The forum established for the elaboration of the constitution (“Assembleia Constituinte”) had unmatched institutional rules as compared to those established after 1988, when the constitution was implemented. In relation to the first years of democratization, the existing IBGE budget data for the period of 1986-1994 are not entirely reliable. For instance, Brown (2002) finds that the country’s debt crisis led to accounting changes that render comparisons after 1987 very difficult. As indicated by our data set, this limitation is only circumvented with the establishment of the Real plan in 1994.

Altogether, the dataset has 113 different budget categories, which are all the categories reported in the IBGE and in the LOA data sets for both periods. The sum of budget categories reported for each year yields the total budget of each year.<sup>3</sup> While 113 categories existed during the time period of our study, not all categories exist in each year. Rather, categories vary across

<sup>3</sup> In order to calculate the total budget for each year, one needs to exclude the following categories: 10000 (Executive Branch), 30000 (Legislative Branch as reported in the authoritarian period) 30500 (Legislative Branch as reported in the democratic period), 50000 (Judicial Branch), and 90400 (Other expenses). These categories represent the sum of several subcategories, which are included separately and are therefore redundant.

and within political regimes because the Brazilian government altered them throughout the years. These modifications occur in the democratic period because the president has the power to create, modify or extinguish ministries, secretaries, and public administration bodies through special legislation. To illustrate, the budget category that represents the expenses of the Ministry of Agriculture takes on the following names in the data set: “Ministério da Agricultura,” “Ministério da Agricultura, Abastecimento e Reforma Agrária,” “Ministério da Agricultura e do Abastecimento,” “Ministério da Agricultura, Pecuária e Abastecimento,” and “Ministério do Desenvolvimento Agrário.” These differences are not limited to nomenclature, but reflect substantive changes in the scope and purpose of the Ministry of Agriculture. Figure 1 shows the total number of categories for every year of data – the observed decreases or increases result either from the introduction of new budget categories or from the fact that some categories are not reported for all years. We are particularly concerned with changes in these reporting categories because we want to ensure that any changes in spending are true changes, not artifacts of the fact that the spending categories may have changed between two years. So we must first identify the set of budget categories that are consistently defined between any two years. As a first step, Figure 1 shows how many categories are present in each annual budget.

Figure 1. Annual Number of Budget Categories in Brazilian Budget

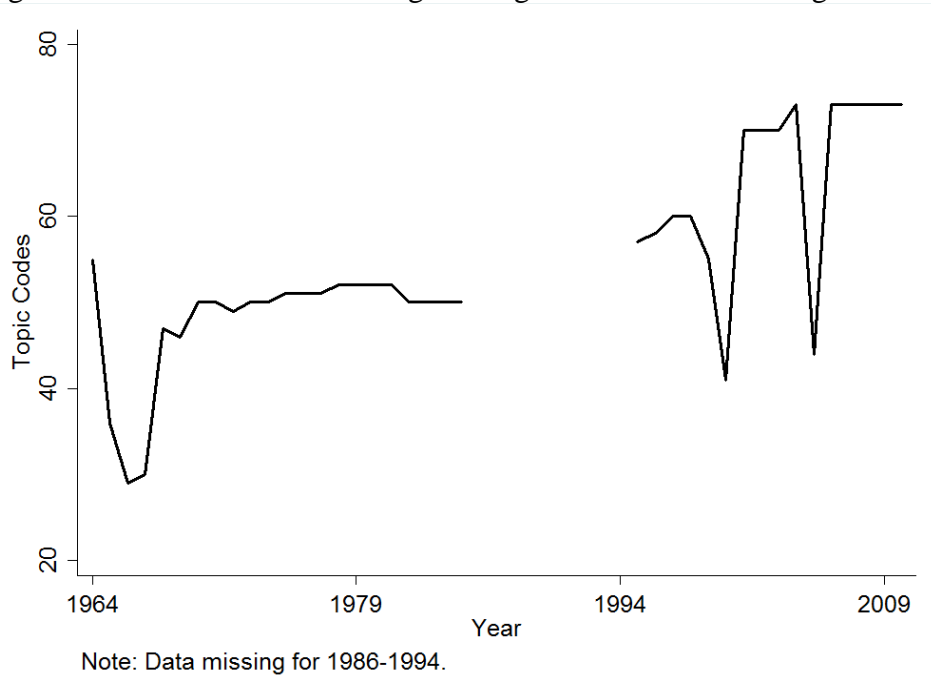
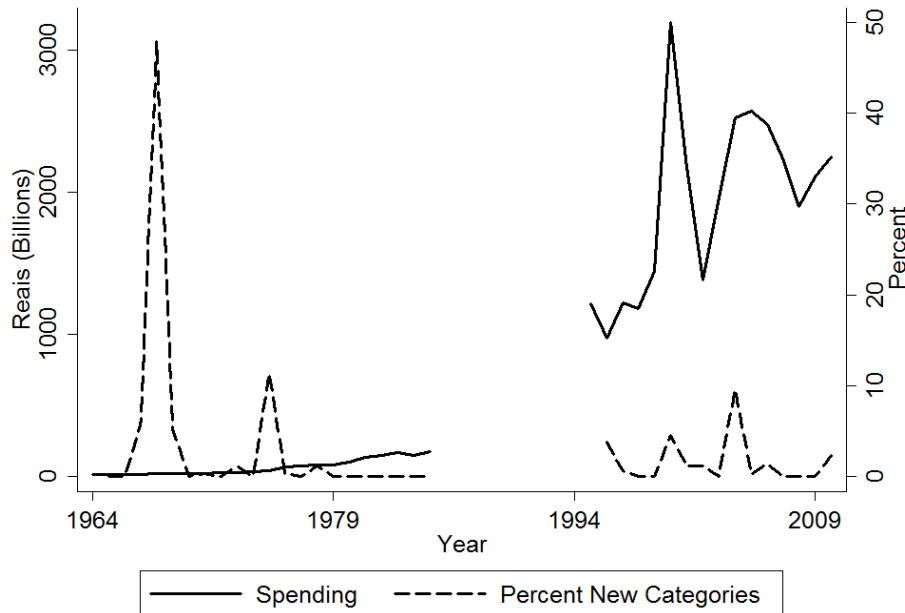


Figure 2 indicates the percentage of total spending that is reported in new categories. Clearly the Brazilian budget underwent major revisions in 1968 and 1975, corresponding to a dramatic increase in new spending programs by the military regime. There were two substantial modifications in the number of budget categories during the democratic period (1995-2010), each of which occurred under a different political party rule. We observe substantial decreases in the number of categories in 2002-2003, at the time when Lula (PT) took office and Cardoso (PSDB) stepped out of office; and in 2007-2008, at the beginning of Lula's second term as president. Although the first decrease seems to suggest that the inconsistencies in budget categories are associated with changes in party rule, the second indicates the inconsistency can also be brought about ministerial reforms. In both periods, only up to ten percent of the total budget was reported in new categories, as indicated by Figure 2, so these reforms were not as dramatic as those during the authoritarian period. Over time, the reporting of the Brazilian budget appears to be stabilizing. With the exception of 1968, however, never do the changes in



classifications affect more than 10 percent of the budget, and typically the number is far lower than this.

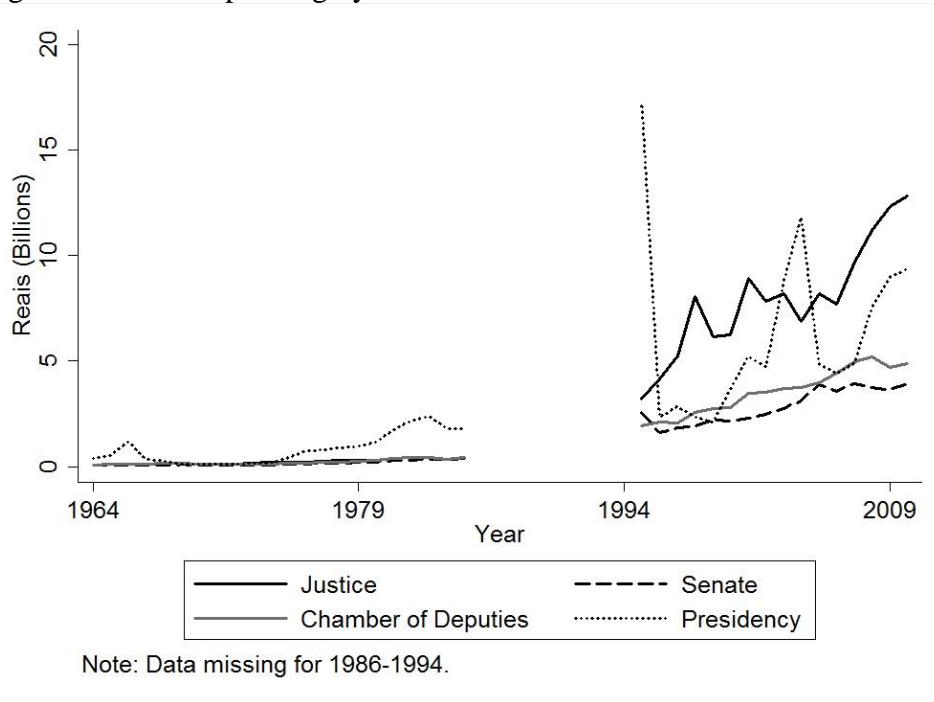
Figure 2. Annual Spending and Percent of Total Spending in New Budget Categories



Note: Data missing for 1986-1994.

Figure 3 presents annual spending by branch of government. While spending on presidency surpasses spending on other branches of government in most periods of the authoritarian regime, it is more volatile during the democratic years. Spending on justice is the top priority in several periods of the democratic governments, and spending on the two houses of Congress is constantly demoted as third and fourth priorities. The sharp decrease in spending on presidency observed between 1995 and 1996 mimics the decline observed in the total budget within the same period (Figure 2). When approving the 1996 budgetary law, the Cardoso administration promoted budget cuts to avoid a public sector deficit estimated to be of R\$ 20 million. In fact, the government was already attentive to the budget deficit at the time of the approval of the 1995 budgetary law.

Figure 3. Annual Spending by Government Branch



### Patterns of Budgetary Change

We calculate percent change values that indicate how much spending changed from one year to the next across the 113 spending categories. As discussed there is some inconsistency across budget categories. If a category had a change in its substantive definition in a certain year or was not reported in a certain year, we do not calculate a percent change value for that year. Consequently, although our data set is comprised of 1,328 observations (Table 1), we report 1,196 change values.

Our first step is to pool these values into a distribution and assess its shape (Figure 4). These percent change values simply represent the number of cases in which a given budget was changed by  $x$  percent, compared to its value in the previous year. Budgeting in Brazil follows a classic punctuated equilibrium pattern, with a tall central peak (indicating the predominance of incremental changes) and very wide tails (indicative of dramatic spending changes). L-kurtosis is a standardized version of kurtosis that is robust against the disproportionate effects of outlying

values. A normal distribution has an l-kurtosis of 0.123, with higher values indicating greater leptokurtosis. The observed budget distribution has an l-kurtosis of 0.401, so the visual and empirical evidence point in the same direction.

Figure 4. Distribution of Percent Changes in Budgetary Allocations, 1964-2010

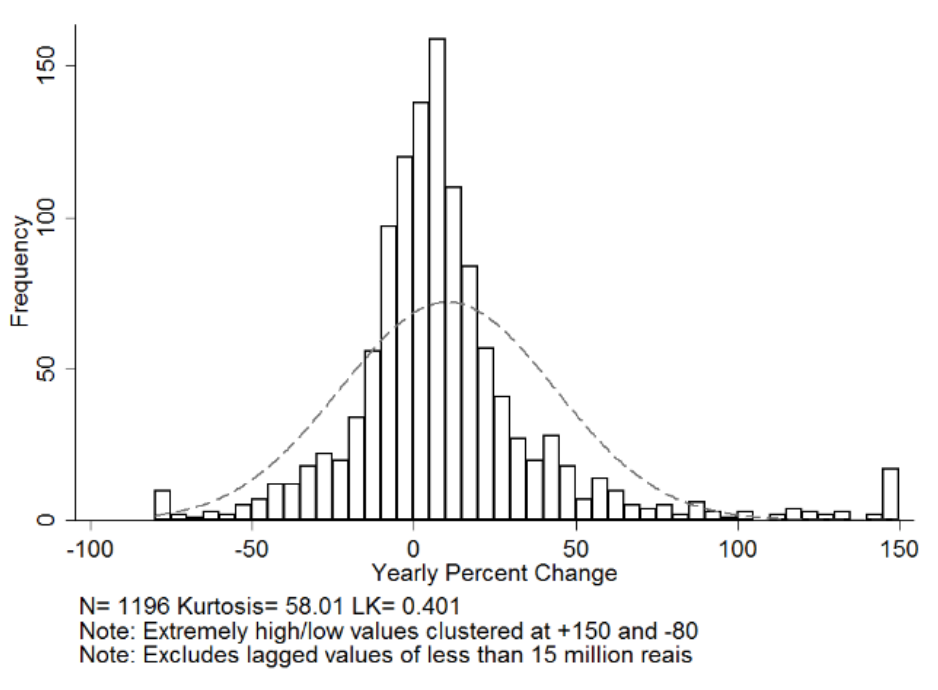


Figure 5 presents the test of our hypothesis. It divides the distribution in Figure 4 by the military and democratic periods. Both distributions have l-kurtosis values higher than 0.123, fat tails, and slender central peaks, suggesting that there is no fundamental difference between the budgetary processes of these periods. Change is erratic in both cases. However, comparison across periods provides support for our hypothesis. Punctuations are more frequent in authoritarian than democratic settings: in the case of Brazil, the l-kurtosis for the military regime is 0.409 and the l-kurtosis for the democratic period is 0.382. This difference is only modest, but in conjunction with the Lam and Chan result it points to systematic variance in the amount of friction operating on authoritarian and democratic regimes. Recall from Figure 3 and Table 1 above that the democratic period involves spending orders of magnitude larger than that from

under the dictators. In spite of the huge rise in the absolute size of the Brazilian budget, the distribution shows roughly similar levels of kurtosis.

Figure 5. Distributions of Percent Changes by Regime Type

a) Authoritarian, 1964-1986

b) Democratic, 1995-2010

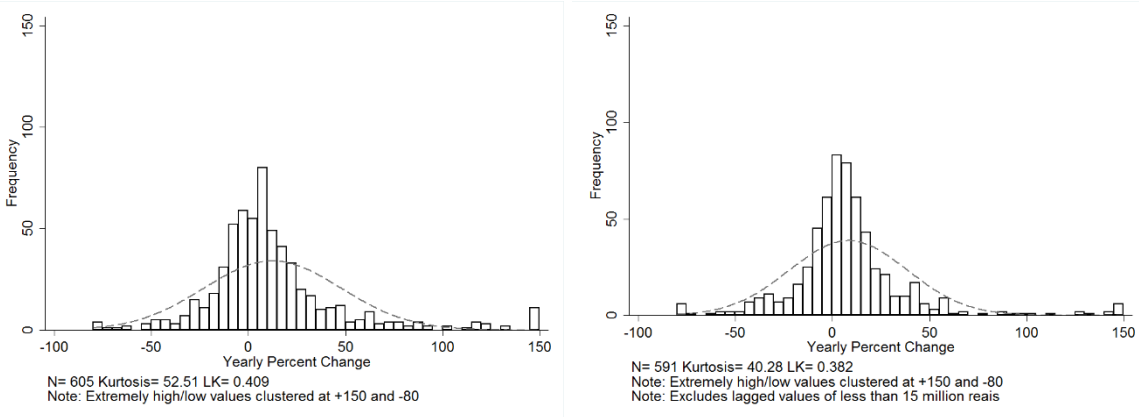
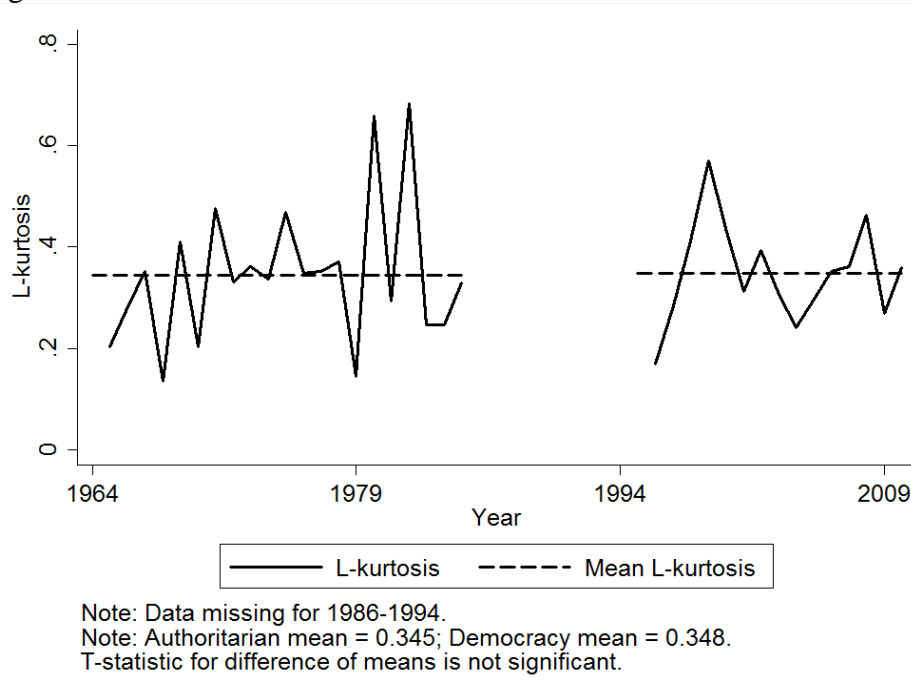


Figure 6 assesses kurtosis on an annual basis, with the dashed horizontal lines indicating the mean kurtosis value for the two periods. These values are almost identical and a difference of means tests shows that they are not statistically distinguishable. We do however note an interesting departure from our findings and the Lam and Chan results. For Hong Kong, they found levels of kurtosis to be lower in the period before political transition. We show the opposite; the two highest 1-kurtosis values in the entire series occur in the years preceding the transition to democracy.

Figure 6. Annual L-kurtosis



We suggest that the underlying processes behind the transition to democracy explain this difference. Colonial rulers in Hong Kong were interested in opening the regime to public consultation and increasing the level of institutional fragmentation and contention (Lam and Chan 2014). In Brazil, public consultation and institutional fragmentation were not fully instituted until the moment of transition.<sup>4</sup>

Transitions from military regimes to democratic forms of government are not simply the product of the desire of rulers. They are the result of the complex interaction amongst splits in the elite level, economic crises and social unrest (Geddes 1999). In the context of these crises that build up to the period of transition, government officials in military regimes may feel forced to promote quicker and more forceful policy changes, addressing pressing social problems that

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<sup>4</sup> The institution of a multiparty system in 1980 was not the result of a desire to liberalize the political system. The intention of military rulers was to disperse the opposition – the view was that the two-party system tended to consolidate the power of the MDB (Skidmore 1989).

were ignored when these threats were not present. These patterns could explain why we find higher levels of kurtosis in such context.

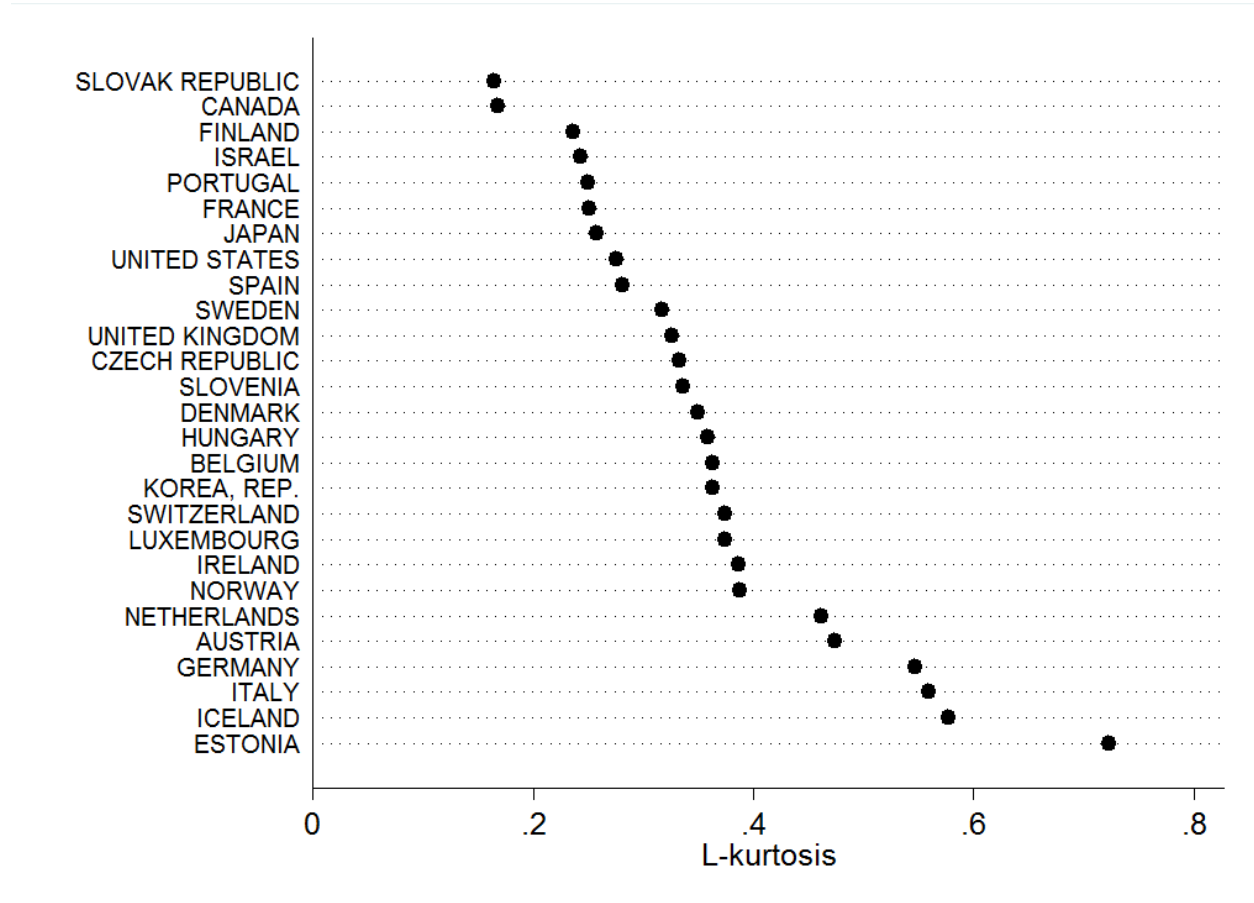
So while we find support for our hypothesis, we also stress the importance of testing PET in different authoritarian settings. Further research could build on previous comparative politics scholarship that suggests variation in the mechanisms by which democratic authoritarian regimes acquire information. With the purpose of identifying and managing sources of societal discontent, different regimes construct and utilize legislatures and multiparty elections, which still exist at the discretion of the authoritarian ruler (see Brancati 2014).

### **Future Research Approaches on Budgeting**

The Brazilian budget shows higher kurtosis during periods of authoritarianism. Taken together with the findings of Lam and Chan, the collective evidence points toward substantively important differences in levels of punctuation across political regimes. Pauw (2007) looked at just a few years of South African budgets, in the only study we know of in that political regime. Two patterns emerge, consistent with the findings of Jones et al. (2009): first, there does appear to be a “general law” of punctuation in budgets. This is the most important insight in the literature, as it suggests that cognitive overload is universal. Cities, school districts, subnational governments, corporations, universities (see Epp 2014), many types of complex organizations have been found to show high values of kurtosis in their distributions of changes in budgets; this does, indeed, appear to be a general rule, a result of limited cognitive and institutional capacity colliding with the overwhelming complexity of the world around us. The second pattern is that organizations differ dramatically in the level of kurtosis their budget change distributions reveal. Figure 7 shows levels of L-Kurtosis for 27 Organization for Economic Cooperation and Development (OECD) countries. The OECD provides budget data for its member-states across

ten commonly defined budget categories from 1990 to 2010, although some countries have data for shorter periods.<sup>5</sup>

Figure 7. LK Scores by Country



The wide variation in LK scores suggest that there is significant country-level variation in kurtosis values in national budgets, variance that could be explained, perhaps, by institutional features related to the efficiency of government decision-making systems as well as by social

<sup>5</sup> We use these data only for illustration. A full test of these theories should use larger datasets to ensure greater reliability in the patterns, and the budget categories as defined by the national government, not those of an international standard, unless (as for the 50 US states) there is a previous agreement to create and report data consistently according to the same standard. When existing budgets are fit, ex-post, to an international reporting standard, we have little confidence that the classifications are done consistently over time, and therefore some large changes could be artifacts.

factors relating to the transmission of information from society to those decision-making institutions. Democracies and autocracies may differ systematically across these dimensions in ways not fully understood, so we urge exploration of these effects using a broader range of governments, in particular beyond the western world, in order to explore these questions in greater detail. Jones et al. (2009, 870) showed that the seven countries in their sample had LK scores in the range of approximately .3 (for the UK) up to .6 (Belgium). The data in Figure 7 suggest that the wider the variation in countries, the wider the variation in outcomes. However, the OECD is an organization of democratic countries. We need wider-reaching data on budgets in non-democratic regimes in order to see if the levels of kurtosis observed in democracy is high or low relative to non-democratic systems. This is the next step in a literature that has so far not fully exploited the institutional differences that may explain the wide variation in levels of kurtosis observed across public budgets.

## **Conclusion**

A robust literature has now explored PET theory with regards to budgeting, but that literature has almost exclusively been focused on advanced industrial democracies, with some attention to subnational budgets (e.g., states, municipalities, and school districts) within these nations. Here we present just the second example of detailed attention to the shape of budgetary change in a nondemocratic setting, building on the work of Lam and Chan (2014). We hope to expand on this work which must first start with more data collection in non-democratic systems, and then to explore the various aspects of democratic and authoritarian states to gather information, and to act on it. These factors may well have counter-vailing effects which are poorly understood.



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