

Punctuated Equilibrium in French Budgeting Processes

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Abstract

We use data on French budgeting to test models of friction, incrementalism, and punctuated equilibrium. Data include the overall state budget since 1820; French budgets by ministry since 1868; and three categories of spending in 91 large French cities for the period since 1977. In every case we show the signature leptokurtic distribution that Jones and Baumgartner demonstrated in US budgeting processes. This suggests that general characteristics of administrative processes create friction, and that these general factors are more important than particular details of organizational design. The legendary centralization and administrative strength of the French state, especially when compared to the decentralized, federalized, and separated powers system of the US system, where the theory was developed, apparently is not sufficient to overcome pressures causing the build-up of friction. Further, our French data cover a wide range of institutional procedures and constitutional regimes in place in France over the period studied. The similarity of our findings across all these settings suggests that administrative structures alone are less important than the cognitive reasons discussed in the original model.

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Introduction

There are two possible reasons for punctuated equilibrium (PE) findings in the distribution of the sizes of changes in annual budgets: Institutional friction and cognitive overload. In this paper we investigate government spending in France and present strong evidence that the cognitive explanation is more powerful than the institutional one. We look at the history of French state spending since 1820; these data show the signature pattern of high kurtosis that is characteristic of a PE process. Next we explore spending in ten different government ministries since 1868; we find similar results. Finally, we look at municipal spending across three budget categories for 91 large French cities from 1977 to 2002; again we find a similar pattern.

The US system of weak parties, separation of powers, federalism, and the shared powers of the legislative and executive branches in the realm of budgeting make it simple to understand the high institutional costs of decision-making there. That system was designed to require concurrent majorities that may often be absent; without them the status-quo policy remains until pressure builds sufficiently to break the logjam. Thus the model of heavy institutional friction that Jones and Baumgartner (2005) laid out is easily understandable in the US context. But the French system was designed with entirely different goals in mind. Many of the ideas in the agenda-setting and PE literatures appear foreign and perhaps irrelevant in the parliamentary context, at least on the surface: Venue-shopping is more limited, elite civil service corps play a more important role, the executive branch has much greater say in budgeting, and parties ensure a consistency in government policy that one does not expect in the US. France has all these characteristics quite powerfully; indeed the constitutional structure of the Fifth Republic was specifically designed to ensure executive dominance and autonomy. France therefore represents a polar opposite case from the US, where the findings of PE in budgeting were first reported.

We take advantage of these substantial differences to lay out a strong test of the theory. First of all, does France exhibit spending patterns characteristic of a PE process? Since the theory was developed and the first findings came from the US with its exceptional institutional design, there is no a priori reason why it must exist at all in another specific institutional framework such as that of France. Second, we take advantage of the many different data series we have that include an overview of almost 200 years of French history, a more detailed look at 130 years, and finally the last 25 years of municipal spending. If we find substantial differences across historical periods, by levels of aggregation, or from the central state to the local level, then we can investigate further the institutional differences that account for this variation. Our findings are that there is substantial evidence of PE processes no matter where we look. Finding such strong evidence across many historical periods, with different data sources and at the local as well as the national levels is powerful testimony to the generalizability of the PE finding and to the idea that its most important driving force is the architecture of human cognition rather than any particular institutional feature of governments.

The core issue we address is very simple: No matter what the institutional design, all modern governments face a dizzying array of thousands of real and potential problems. The complexity of the tasks governments are asked to take on is so great that proportionate response to all the various problems is impossible. In sum, findings of high kurtosis in the French data similar to what has been found in the US would suggest that these cannot be caused by any differences in institutional design between the two countries, but must be related to a similarity: The overwhelming complexity of the issues of public policy with which all governments deal.

Budgetary Incrementalism, Punctuated Equilibrium, and Empirical Analysis

While the US and the French institutional structures and budgeting processes are starkly different, both systems must deal with an ever-changing mix of social, economic, political, and international issues constantly rising and falling in intensity at different rates. US congressional committees hold thousands of hearings each year on hundreds of different topics and executive branch officials simultaneously implement policies ranging from farm subsidies to large-scale war. Similarly French civil servants operate policies in hundreds of different areas covering the full range of activities from delivering the mail to space research and genomic mapping. There are no simple gauges to tell decision-makers which problems are most severe, which concerns affect the public the most, or which have the greatest chance of being solved. Rather, in both systems, there are never-ending debates about these very questions. Jones and Baumgartner (2005) laid out the reasons why, through a process of “attention-shifting,” we should expect individuals and governments alike, when dealing with such complex environments, to distribute their attention in fits and starts.

Most issues, most of the time, are treated within the realm of specialized policy communities and operate well below the “radar screen” of the political leadership. With little attention to them, policy at Time_t is largely determined by adherence to the status quo, or the policy at that had been adopted Time_{t-1} (often itself a simple re-affirmation of a previous policy). But when major problems arise within that issue-area then higher level attention may be called for. The very emergence of the issue as a “new” problem (or a newly severe one) may imply that the previously chosen solutions did not work, or perhaps even that the previous understanding of the nature of the problem itself was faulty. Through these mechanisms, issues selected for attention are often the objects of significant changes in policy outputs but the vast bulk of issues at any given time are carried on with great deference to the status quo. Policy tomorrow may

differ quite dramatically from the policy of yesterday in those few areas that pass a threshold of urgency and attention, but the vast bulk of the issues are simply carried forward with minimal adjustment from the previous period. This model of “hyper-incrementalism” combined with punctuations is at the heart of the Jones and Baumgartner model of PE. The model allows for very simple tests based on analyses of the entire distribution of changes in annual policy outputs such as budgets as we will do here.

Jones and Baumgartner laid out the reasons why, through the Central Limit Theorem, we would expect that the distribution of annual changes in the severity of thousands of social indicators affecting the government budget will be distributed Normally. Since there are thousands of economic, social, and stochastic inputs that affect government programs and no single process determines any more than a few of them together, their combination must mathematically be distributed Normally, at least in annual percent changes, as we analyze here. If changes in the severity of the social inputs are distributed Normally and government is reacting to these changes proportionately, then we should see a perfect illustration of incrementalism: Annual changes in budgets should also be Normally distributed. If there is a model of PE, on the other hand, with significant institutional or cognitive friction, then the distribution of budget changes will not be Normal but will have a high kurtosis value, even if the underlying social inputs are Normal. So we have a very simple test that can be applied to any consistently-defined series of policy outputs.

Budgeting Processes in France

We present data here on French budgeting back to 1820, a period during which French constitutional structures and budgetary procedures changed many times, sometimes violently. Our data begin with the budgets of the *Restauration* period (1815–1830), and continue through

the Monarchy of July (1831–1847), Second Empire (1851–1870), Third Republic (1871–1939), Vichy (1940–44), the Fourth Republic (1945–1958), and the Fifth Republic (1958–). The period includes several wars, foreign occupations and a set of constitutional regimes ranging from Monarchy and Empire to either parliamentary-centered democracy or the current executive-centered democracy. We present more detailed information about specific ministerial budgets from 1868, also covering several different constitutional regimes. Finally, we show data on municipal spending in 91 large French cities from 1977, all within the current 5th Republic.

Over the period of our study, a wide range of constitutional and administrative procedures affected the budgetary process in France. These have varied substantially over time and differ between the central and local levels (for detailed descriptions of French budgetary processes see Adam, Ferrand, and Rioux 2003; Isaia and Spindler, 1986; Kott, 2004 ; Le Guen, Message, and Tessier, 1988; Sine 2006; Théret, 1995). Compared to the US, however, there is much more substantial centralized control of budgets by a single principal: The Minister of Finance acting on behalf of the Government. Nowhere is there the type of separation of powers or decentralized and complicated budgetary process as has been the norm in the US. On the other hand, the process of budgeting even in a centralized system is not straightforward. Complex trade-offs must routinely be made across hundreds of spending categories in reaction to thousands of shifting variables. In the next section, we turn to see whether the process of budgeting shares the PE characteristics that Jones and Baumgartner have demonstrated for the US, with its widely different procedures and institutionally-induced friction. There are many reasons to expect the French state, with its substantial autonomy, to be more efficient.

Data and Results

We present three different series of budgetary data: Overall state spending since 1820; ministerial-level spending since 1868; and municipal spending for 91 large cities since 1977. All series stop in 2002, the most recent year available. Data come from official sources as indicated in our appendix, and all have been adjusted for inflation and to delete any calculations of annual changes in years in which substantial accounting or classification changes occurred. Figure 1 shows overall state spending in France since 1820 as well as the percent annual change.

(Insert Figure 1 about here)

Using inflation-adjusted (2002) French Francs, the dark line in Figure 1 documents movement from a total state budget in 1820 of 14.6 Million Francs to a final figure of 1.684 Billion Francs: Growth by a factor of 115 over the period. Of course, crises such as the two World Wars are plainly evident in the graph, as is the dramatic rise in spending in the post-1950 period. The lighter line in the Figure shows annual percentage changes in spending. Here we see periods of substantial volatility in spending associated with major conflicts, a period of great budgetary stability (and little growth) between the Franco-Prussian War and the build-up to World War I, and a substantial decline in variability after the beginning of the 5th Republic. Wars and constitutional instability clearly make their marks, and this is no surprise. We can also see a great decline in annual variation in spending after 1950; state spending is considerably less volatile since then compared to previous historical periods, when it was not unheard of for the entire budget to grow or to contract by over 50 percent. Such huge shifts no longer occur, a finding similar to what Baumgartner and Jones have discovered in the US. Volatility in France was very high right up until this period, however, and the figure shows a 70 percent increase in state spending in 1950, in the thick of post-war reconstruction efforts.

We are interested in the distribution of the sizes of annual percentage changes. The theory calls for a simple comparison of a frequency distribution of annual percentage changes to compare it with a Normal distribution. Given the obvious importance of war and constitutional instability in France, we also want to be certain that any dramatic budgetary shifts we do observe are not solely related to these causes, and we do so below. Figure 2 presents the same data as in Figure 1 as a frequency distribution, showing the number of cases with each size change, from a decline of 50 percent to an increase of 100.

(Insert Figure 2 about here)

Figure 2 makes clear that French state growth has been highly punctuated over time. The huge central peak of the distribution documents the large proportion of total changes in the range of -10 to +10 percent, and the comparison with the overlaid Normal curve is obvious. Compared to the Normal, there are more cases in the peak, fewer in the “shoulders,” and many more outliers. We can provide more evidence about the PE nature of budgeting in France by looking in more detail at individual ministerial series, though these are not available for as many years. We were able to gather detailed ministerial-level spending data for ten different ministries, as described in Table 1. We have seven series beginning in or around 1868 and ten series for the post-1947 period.

(Insert Table 1 about here)

We have been careful to adjust these series for the inevitable problems of shifting ministerial portfolios including in our calculations only those annual changes based on the identical baseline; that is, we deleted cases where substantial reorganizations of ministerial boundaries occurred. We can confidently compare budgetary changes for the remaining data to

see if these detailed series present a similar pattern to that shown in Figure 2. Figure 3 shows that indeed they do.

(Insert Figure 3 about here)

Figure 3 presents over 1,000 observations of spending changes and again makes clear the high kurtosis level of these data: They are clearly very different from Normal.

We continue our tests with a look at municipal spending. Our dataset here consists of three categories of public expenditures for the 91 French municipal governments (“*communes*”) with populations over 50,000 in 1977. Data are available for each year from 1977 to 2002, except for 1999, which is missing. Our data consist of 1) total expenditures; 2) personnel; and 3) infrastructure (*équipement*). We use these because we are certain that accounting rules in use in different cities are consistent for these basic categories of spending, which are clearly defined in French administrative and finance law. Personnel expenses are self-explanatory. Infrastructure expenses are a category of capital expenses including roads, water treatment, and other capital investment projects. The value of the series for us is that it is consistently defined for all cities and does not change over the period. Total municipal spending consists of personnel charges; debt payments (interest charges); other operational expenses; infrastructure; capital expense charges; and other capital spending. Our analysis of the full set of series showed that many were not consistently defined over time and many series contained high numbers of negative real values, indicating accounting adjustments. (Interest on municipal debt is consistently defined, of course, but we excluded it because it is not the object of any annual decision-making process, but rather reflects the accumulation of decisions made in many previous years.) We therefore limited our analysis to the series in which we had the greatest confidence and which reflect annual decisions. Figure 4, based on over 6,600 observations, shows our results.

(Insert Figure 4 about here)

Like national-level spending, municipal spending in France shows the signature characteristics of PE: A high central peak, few cases in the shoulders, and a large number of outliers. Further analyses of the three series individually reveals some differences among them. Total spending is the closest we have observed to Normal, with a kurtosis value of less than seven. Personnel expenses are extremely punctuated and entirely account for the unusual “second” peak which is clearly visible in Figure 4. We expect to explore this feature in later studies. Infrastructure spending is also highly punctuated. Total expenses show almost a Normal shape with the exception of too many cases far out in the right extreme. In any case, our brief analysis of spending at the municipal level shows that spending are highly punctuated but also raise interesting questions for further analysis about the characteristics that may accentuate or attenuate these tendencies.

Together, the data we have presented make clear that French budgets are highly punctuated. Figure 1 may make one wonder, however, if perhaps those large changes occurred only during times of war or instability. If this were the case then the theory would not be supported because the causes of punctuations would be stochastic shocks rather than the normal functioning of government procedures and cognitive architectures as Jones and Baumgartner (2005) suppose. We can approach this question in several ways. First, we can estimate kurtosis values for the entire series and then again while eliminating war years. Second, we can look at different constitutional regimes to see if they differed significantly from each other. After all, the 5th Republic has been free of such crises and our municipal data series reflect only local spending, not military mobilizations (absent in any case during the 1977–2002 period as well).

Table 2 shows a statistical summary of our data broken down in this way. (The table also shows our municipal data individually by series and grouped as presented in Figure 4.)

(Insert Table 2 about here)

Table 2 shows some large differences in budgeting patterns across the different series we have explored, but each and every series exhibits substantial kurtosis. As was clear from Figures 2, 3, and 4, each of the distributions differs systematically from the Normal curve (which would have a kurtosis value of 3). Overall state spending from 1820 shows a kurtosis of almost 15, a value which declines only to 14 when we exclude the years associated with the Franco-Prussian War, World War I, and World War II. Each of the other series shows kurtosis values ranging from 20 to over 700, though there are sometimes substantial differences between them. US kurtosis values reported by Jones and Baumgartner (2005, 182) were approximately 60 for the overall state budget from 1800 to 1994 and 85 for a dataset consisting of 62 categories of spending from 1947 to 1996. These are broadly in line with what we observe in the French case. Further, as in the US case, extremely large wars are indeed the cause of some of the punctuations and therefore inflate the kurtosis scores somewhat. However, when we look at French budgets excluding war years or when we look at only the 5th Republic, or when we look at municipal spending during a period with no war, we see that high kurtosis values remain. War is only a small part of the story.

The different kurtosis values presented in Table 2 make clear that a wide range of outcomes can occur even within a single system. We expect to explore these differences in greater detail in the future. For the purpose of this paper, however, the fundamental point is that every one of the series we have investigated, across all the periods studied, deviates from the Normal distribution. Levels of punctuation differ by constitutional regime, historical period, and

between periods of war and peace, certainly. But no matter which regime, period, state of war, or even level of government, we consistently see that every budget series is highly punctuated.

Conclusion

We explored French budgeting processes here and showed that all levels of budgeting, across all historical periods from 1820 to present exhibit the characteristics we expect to see in a PE process based on a friction model. Jones and Baumgartner laid out two possible reasons for the high friction associated with budgeting in the United States: Cognitive overload and institutional friction. Our test of various French budgetary data shows that each of these is likely to remain an important avenue for future research. Levels of friction clearly differ across the various datasets and historical periods we have explored. However, our most powerful finding can easily be summed up. That is because the development of the French budgetary process was designed to be a triumph of rationalism. In the country of Descartes, it was expected that the Ministry of Finance would exert significant control over state spending, and it does. Even if this has not been constant over time, certainly in the period of the 5th Republic there are very few reasons associated with institutional friction to expect high kurtosis in French budgeting, as compared to the US case. Our finding of high kurtosis values in every series we looked at, including those limited only to the 5th Republic, is powerful evidence for the cognitive explanation of the friction model.

Institutional variation clearly plays a substantial role in these processes as well, of course, and we have shown substantial variation in the levels of friction across different parts of our study. We will explore those in greater detail in the future. For now, we are left with a simple observation: The legendary centralization of the French state was designed to emphasize Cartesian rationality, in perfect contrast to the separation of powers system in the United States.

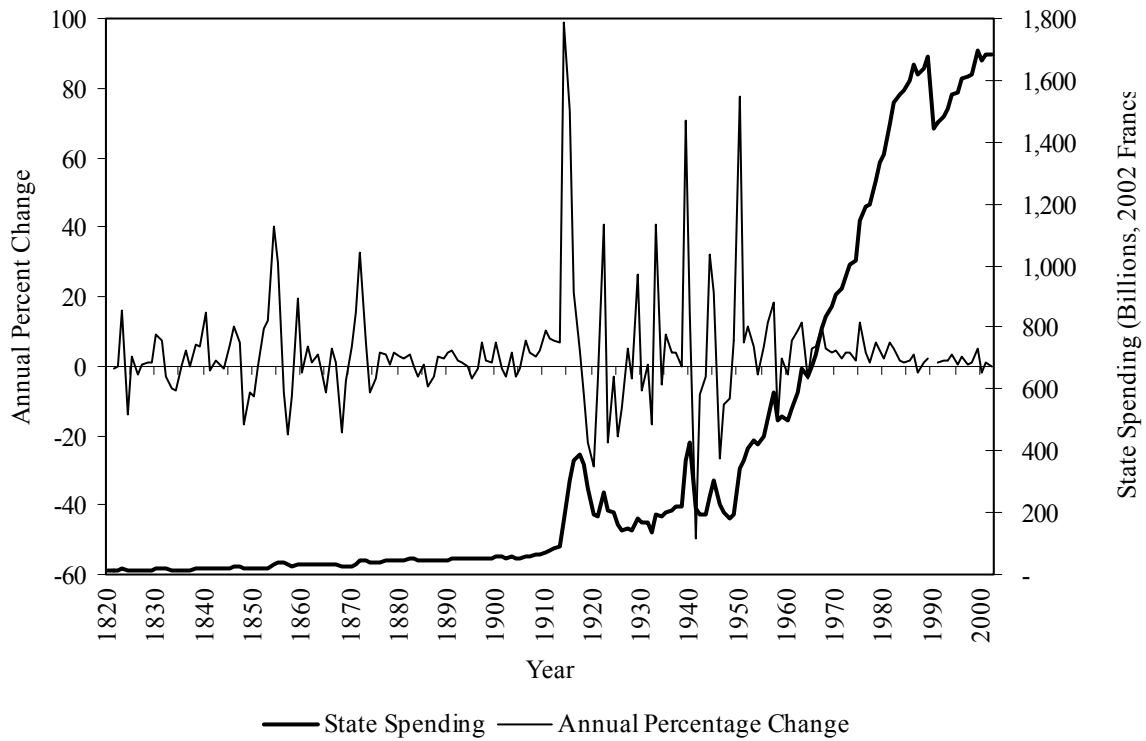
In the French view, powerful civil servants in the Ministry of Finance, working for the democratically elected Government, should have authority over the entire budget. The goal of comprehensive rationality remains elusive, however. Instead, we see the same general pattern of adherence to the status quo until forced to make dramatic adjustments. These are certainly general characteristics of government in the face of overwhelming complexity. Institutional procedures may minimize or exacerbate them, but they cannot make them go away.

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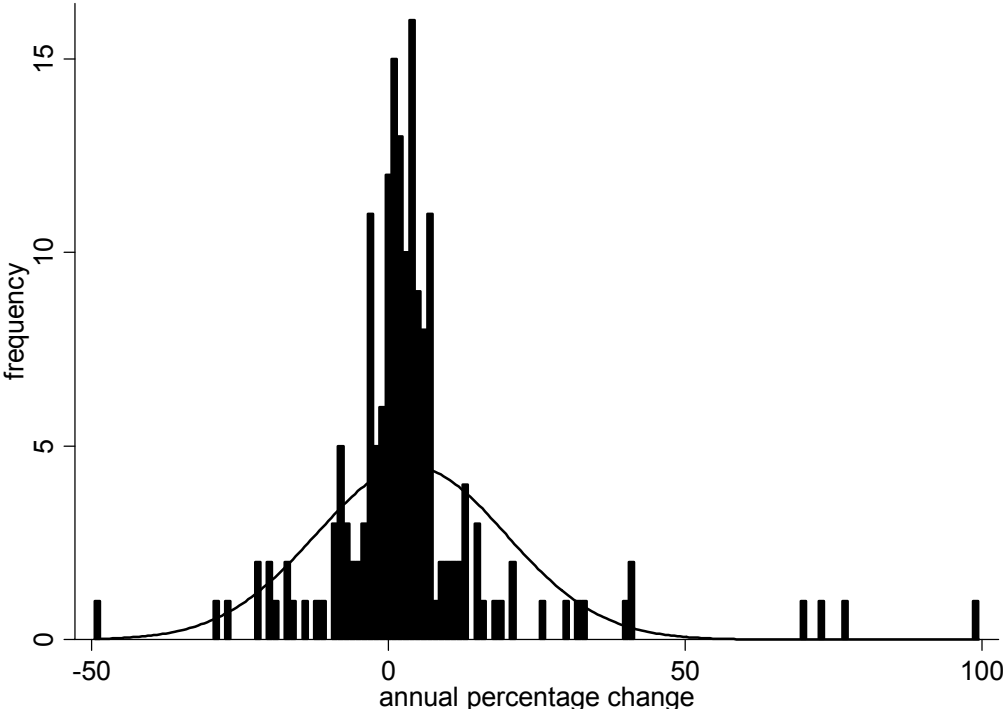
Tables and Figures

Figure 1. State Spending in France, 1820–2002.



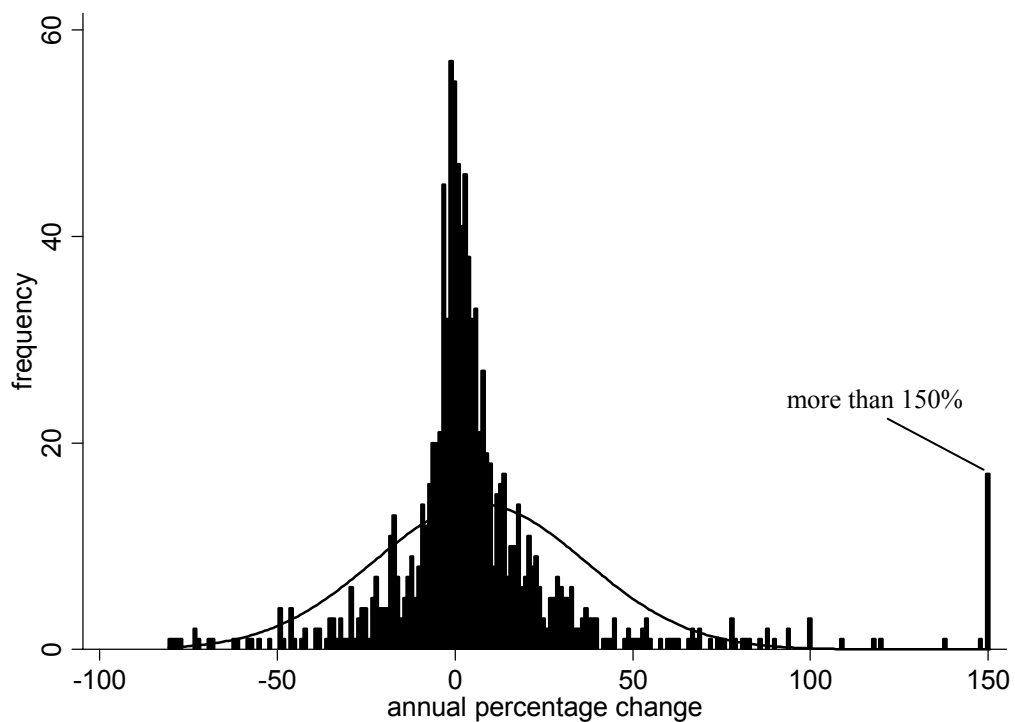
Note: The Figure shows overall state spending in billions of 2002 Francs. The large decline in 1990 is an artifact of budgetary accounting rules imposed by the European Union. No percentage change score is calculated for that year, and we do not include this observation in subsequent analyses.

Figure 2. Distribution of Annual Percent Changes in French State Spending, 1820–2002.



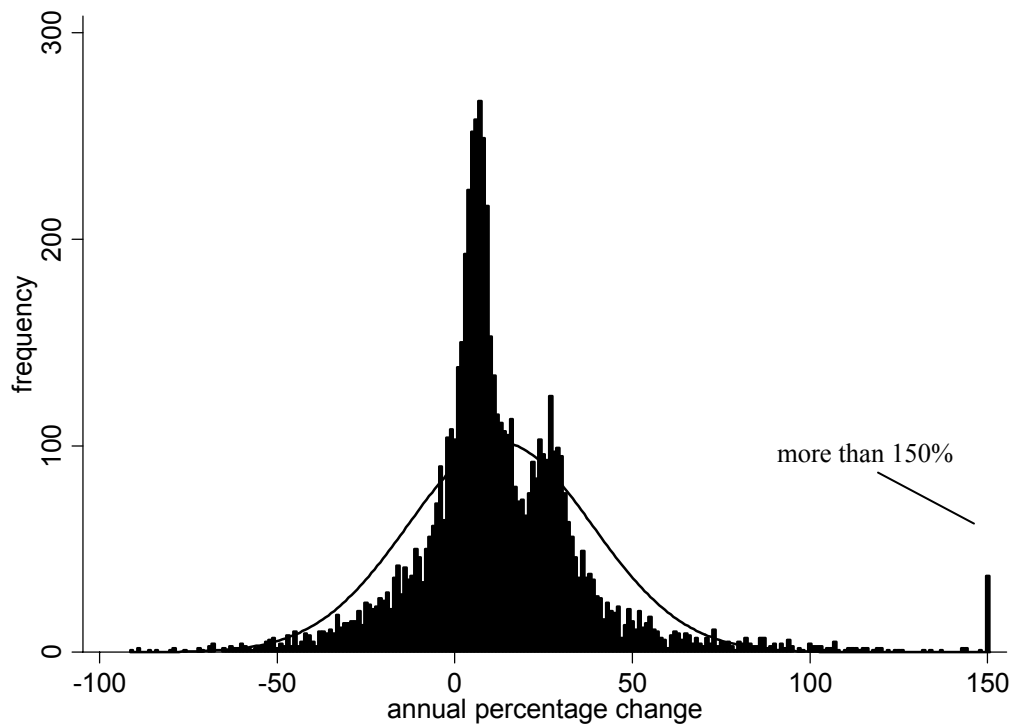
Note: The Figure shows the number of changes of each size, in one-percent increments. Data are based on those presented in Figure 1.

Figure 3. Distribution of Annual Percent Changes in Ten French Ministerial Budgets, 1868–2002.



Note: The Figure shows the number of changes of each size in French ministerial budgets. All changes above 150% are collapsed at that value. See Table 1 for an explanation of which ministries are included.

Figure 4. Distribution of Annual Percent Changes for Three Categories of Municipal Spending, 91 large French Cities, 1977–2002.



Note: The Figure shows the number of changes of each size in annual spending across three categories of spending in 91 large French cities, 1977–2002. All changes above 150% are collapsed at that value. The categories are: total, personnel, and infrastructure.

Table 1. Detailed Ministerial Budget Series Available.

Data series	Beginning	End	Years Covered	Missing or Inconsistent Values	Total N
Economy and Finance	1868	2002	135	3	132
Education	1868	2002	135	6	129
Public Works and Transportation	1868	2002	135	7	128
Justice and Interior Affairs	1868	2002	135	2	133
Defense	1868	2002	135	2	133
Agriculture	1869	2002	134	3	131
Industry and Trade, Research and Technology	1881	2002	122	15	107
Social Affairs	1947	2002	56	2	54
Housing	1947	2002	56	4	52
Veterans	1947	2002	56	2	54
Total			1,099	46	1,053

Note: Data are available for the years and ministries indicated. Data are generally missing for 1941 and 1942 for all data series. Individual series also have various individual years missing as well. We have excluded from our analysis any years in which substantial reorganizations of ministerial functions make calculations incomparable to the previous year. This affects a total of seven data points over the entire series: Finance 1990; Education 1960, 1965, 1975, 1982; Public Works 1969 and 1982. We are left with a total of 1,053 observations as the table indicates.

Table 2. Characteristics of French Budget Series.

Budget and Period	N	Mean	St. Dev.	Skew	Kurtosis
Overall state spending, 1820–2002	180	3.82	16.04	2.41	14.75
Overall state spending, excluding war years (1869–70, 1914–18, 1939–44)	167	2.63	11.80	1.85	13.56
Ministerial series, 1868–2002	1,049	12.58	101.40	21.32	570.24
Third Republic (1871–1939)	464	10.09	52.78	6.10	54.91
Third Republic, excluding 1914–18	429	8.39	48.19	6.91	72.91
Fourth Republic (1946–1958)	124	16.15	61.66	3.92	20.24
Fifth Republic (1959–2002)	420	6.27	35.33	12.19	192.46
Municipal spending, 1977–2002, combined series (shown in Figure 4)	6,609	13.34	32.27	7.53	160.63
Municipal spending, 1977–2002, total	2,083	12.52	17.03	0.63	6.75
Municipal spending, 1977–2002, personnel	2,263	12.25	27.67	24.17	755.12
Municipal spending, 1977–2002, infrastructure	2,263	15.19	44.78	2.41	16.66

Note on Budgetary Sources

The sources for national-level budgetary data are the INSEE (*Institut National de la Statistique et des Etudes Economiques*) Statistical Handbook (annual). The historical data (1868 through 1939) are gathered through a retrospective series published in the 1951 French Statistical Handbook. All other data have been computed from the annual INSEE Statistical Handbooks. For data after the Second World War, we have used the Statistical Handbook 1947–1987 published by the INSEE. From 1988 onwards, we have used the annual publication of INSEE called *Tableaux de l'Economie Française* which provides a complete presentation of public spending adopted by the Parliament through the Finance Law. Total expenditure is made up of separate series for Defense and Civilian public spending. Each statistical series is originally produced and delivered by the Direction of National Public Accounts (a division of the Ministry of Finance). Data are expressed in current francs and were then adjusted into constant francs using the Consumer Price Index (CPI) as supplied in the INSEE publications. Both raw and inflation-adjusted series are available.

Municipal budgetary data are the detailed statistics handbook yearly published by the French Treasury. The publication is called “Comptes simplifiés des communes françaises.” For 1999, which was missing in the first data source, we use data from the Ministry of Interior’s Direction Générale des Collectivités Locales (DGCL) available at this web site:

<http://www.dgcl.interieur.gouv.fr>. (Complete data on all French municipalities (approximately 30,000 towns) is available for the last three last years on the following website:

<http://alize2.finances.gouv.fr/communes>.)

Biographical Notes

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