The More Things Change, the More Things Stay the Same: 
A Comparative Analysis of Budget Punctuations

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Abstract
In this paper, I identify whether shifts within budgets occur and investigate the variation of these shifts. Building on stochastic process methods, I find that budgets in all four cases exhibit mostly incremental changes punctuated by extreme shifts. In order to explain these punctuations in budget distributions, I rely on two models: partisan control of government and partisan distance of the assembly. The two models are tested using national budgetary data across all government functions for Denmark, Germany, the United Kingdom, and the United States since the 1960s. The paper finds that partisan distance increases the degree of punctuations in the German and the British cases, whereas there is some evidence for the partisan control model in the American cases. In the Danish cases, partisan distance reduces the degree of budget punctuations.
Introduction

Budgeting is in essence a conflict over scarce resources; therefore budget negotiations are often contentious and the subject of heightened political attention. Actors within all sectors of the political system attempt to infuse their individual priorities in the new budget. As a result, budgetary conflict centers around trade-offs between budget categories. Taking a conservative example, the median change for the Danish budget appropriations from 1985 to 1986 across all government programs was a modest 1.4 percent. However, this on average incremental increase included a more than 20 percent cut for the Energy and Environment resort, several small changes, as well as a 13 percent increase in the budgets of the Foreign Affairs and Justice ministry. In any given fiscal year, some areas of the national budget experience little change while others suffer dramatic cuts or undergo massive expansions. The occurrence of large scale shifts I define as budget punctuations. Neither the public’s focus on entitlements nor the prevalent theory’s emphasis on incrementalism captures this phenomenon. This paper focuses on this theoretical gap through explaining incremental movements accompanied by unusually large shifts within particular budgetary categories.

Building on stochastic process methods and considering the annual allocation of budgets as collectively-expressed policy preferences of democratic governments, the paper contends that budget changes across policy categories can be expressed as a distribution of all changes (Padgett 1980). This line of inquiry delivers two rewards. First, in contrast to budgetary studies that focus on change within a specific policy area, studying changes as a stochastic process takes into account that different types of budget changes are part of the overall annual budget. Second, it shows that budgetary conflict centers around categorical shifts and trade-offs between categories rather than total budget changes. In short, the distributional model of budgetary decisions offers a new understanding of budgetary outputs.
After describing the dependent variable, I construct four hypotheses based on three models of policy-making. First, scholarly work on punctuated equilibrium in American politics (Baumgartner and Jones 1993) delineates that policy making is marked by a high amount of stability and change. I expand their policy process model (PPM) to investigate budgets in all four countries. Second, building on Downs (1957), the partisan control of government model (PCM) maintains that Leftist and Rightist parties hold divergent spending preferences. I test whether these divergent preferences determine budget punctuations and whether only newly elected governments are able to implement their preferences. Third, the partisan distance model (PDM) asserts that the greater the difference in ideology and strength between governing and non-governing parties, the greater the occurrence of budget punctuations. Overall, the goal of this paper is to enhance the empirical and theoretical understanding of how political institutions and partisan preferences shape budgetary outputs in developed democracies.

I employ time series regression methods in order to test the three hypotheses for Denmark (DK), Germany (GER), the United Kingdom (UK), and the United States (US) for the period between 1963 and 1989. Graphical and statistical evidence confirms that budget changes are characterized by incremental changes punctuated by extreme shifts in allocations in all four countries. I also find evidence for the partisan control model in the American case and strong support for the partisan distance model in the British and German case. The Danish case runs counter to the expectations of the partisan distance model: budgets are punctuated when the political parties in parliament similar in ideology and strength. I conclude the paper by discussing the findings and placing them in relation to existing empirical evidence and theoretical frameworks.

**Budget Distributions**
The literature on the various aspects and determinants of public spending is immense in its theoretical, empirical, and methodological scope.\(^1\) In general, current research focuses on a single policy area (such as welfare spending or deficits) and the theoretical dialogue centers around the impact of domestic institutions, partisan preferences, and the international environment on public budgets. However, its exclusive focus on specific policy areas does not advance a general theoretical argument about budgeting *per se*, and fails to recognize that decision makers propose and legislate budgets in their totality. Contradistinctively, this paper considers the entirety of annual budgets as the unit of analysis.

Since government resources are limited and budgeting is a multi-dimensional endeavor (Tsebelis and Chang 2004), budget decisions reflect the importance of one specific matter in relation to all other potential issues. A model which comprises all types of budgetary change is based on the idea that policy choices can be expressed as a full distribution of choices rather than single choices. This notion approaches budgeting as a stochastic process and conceptualizes budget changes in terms of probability densities (Padgett 1980, 359). I build on this idea and define budget punctuations as the distribution of yearly percentage changes in budget across all governmental functions. Therefore, a punctuated budget is one that exhibits incrementalism *and* massive change, whereas a non-punctuated budget displays changes that are similar to each other. Both insights – employing the entire budget as the unit of analysis and understanding change as a stochastic process –are the theoretical bases of studying budget punctuations.

**Theoretical Approaches for Explaining Budget Distributions**

Beginning with Wagner’s (1893) law of the expansion of public expenditures, annual budgets have been identified as one of the central outputs of political systems in general and

\(^1\) For an overview, see Persson and Tabellini (2000).
advanced democracies in particular (Wildavsky 1964). Recent scholarly work on both sides of the Atlantic has reinvigorated the interest in budgets and policy change. Cumulatively, the major research questions concern how people interrelate in political institutions when deciding on budgets, and why budgets as well as budget institutions change. These studies can be categorized into two distinct approaches. One approach is to analyze budget authority (mainly in the US and the UK) employing a framework derived from literature on American public policy processes and bounded rationality (Jones et al. 1998, John and Margetts 2003, Jones et al. 2003; Soroka and Wlezien 2005, Mortensen 2005). The other approach concentrates on public spending (mainly in comparing parliamentary democracies) and utilizes collective choice theory and spatial modeling (Cusack 1997, Bawn 1999, König and Tröger 2001, Bräuninger 2003, Tsebelis and Chang 2004, Hallerberg 2004). Using these two distinctive literatures, I develop four hypotheses regarding the sources of budget punctuations.

Policy Processes and Bounded Rationality

Building on bounded rationality theory and public policy research (Simon 1947, Simon 1985, Baumgartner and Jones 1993, Jones 2001), the argument of the policy processes model (PPM) is that institutional friction (defined as the sum of decision-making, transaction, and information costs) and attention shifts determine policy change. Baumgartner and Jones (1993, 2002, and 2005) maintain that periods of both dramatic change and relative stability characterize American politics. In their punctuated equilibrium model, they label periods of stability as negative feedback processes (or incrementalism) and times of rapid policy change as positive ones. Early scholarship (Lindblom 1959, Davis et al. 1966, and Wildavsky 1964) understands budgets as incremental and depicts policy change as a gradual, cooperative process that allows for marginal change based on the notion of “fair share”. Decision makers
in clearly established institutional structures attach a stable policy image (set of ideas) to a policy and agree on static policy outcomes. In contrast, rapid change is defined as a self-reinforcing mechanism where a particular issue gains disproportionate attention from many policy venues and institutional barriers are overcome. As a result, policy changes dramatically. In short, literature on policy processes and bounded rationality suggests that increasing institutional cost and cognitive limitations of actors (i.e. shifts in attention) generates changes that are more stable and more extreme over time, i.e. policy changes are increasingly punctuated.

Spatial Modeling and Rational Choice

A second approach to studying public policy in general and budgetary politics specifically rests on the theory of rational choice and spatial modeling (Hotelling 1929, Downs 1957, Hinich and Munger 1997). The guiding assumption is that actors base their decisions on the spatial model of fixed preferences. This means that policy alternatives are represented as points in a policy space and the policy makers’ coherent policy preferences are symbolized by utility functions. Two separate applications of this basic postulate have been advanced in the literature on budgetary politics: (1) partisan control models which stress the electoral incentives for political parties to change policy according to constituents’ preferences and (2) veto player models which take not only preferences but also the institutional structure of a political system into account.

Proponents of the partisan control model (PCM) employ Downs’ (1957, 115-116) assumption that the ideological composition of parties can be ordered on a left-right scale, corresponding to the desired degree of state intervention into the economy. In his classic statement regarding partisan control, Hibbs (1977) (also Tufte [1978] and updated by Boix [1988] for the supply side epoch) argues that (1) Left and Right constituents have divergent
preferences on policy outcomes and (2) parties competing for votes promise to implement policies that best serve the groups they represent. Thus, proponents of the partisan model “conceive of politics as a market in which politicians and governments deliver policies in exchange for specific or generalized political demands and support” (Schmidt 1996, 155). In short, parties pursue policies in order to create winning electoral coalitions; in the budget context, parties spend money to reward constituents.

Recent advances in the literature on budgetary policies and public spending in advanced democracies reject the notion that partisan preferences can easily translate into public policies. Instead, proponents of the veto player model (VPM) (Romer and Rosenthal 1978, Tsebelis 1995 and 2002, Bawn 1999, König and Tröger 2001, Bräuninger 2003, Tsebelis and Chang 2004) argue that, in addition to actors’ spending preferences, their spatial locus within governmental institutions, as well as their strategic interaction with others, determines policy change. Tsebelis (1995, 301) defines veto players as “individual or collective actors whose agreement … is required for a change in policy.” Proponents of the VPM assert that the logic of decision making is similar in all representative democracies and contend that “the more veto players there are, and the more their preferences diverge, the harder it is, on average, to change policy” (Bawn 1999, 708). Hence, different institutional set-ups as well as different alignment of interests along major issue dimensions affect the strategic structure of decision making. Overall, the three major models introduced here (PPM, PCM, and VPM) outline determinants of policy change but only marginally address the sources of budget punctuations. In the next section, I derive explicit hypotheses regarding budget punctuations.

Models for Explaining Distributions of Policy Change
Policy Processes Model

Only one of the three outlined models provides us with a prediction regarding budget punctuations. Authors of PPMs argue that, induced by institutional constraints and attention shifts, policies remain fairly unchanged for an extended period of time and then change dramatically in some areas. Hence, the distribution of budget changes should resemble a pattern of high degrees of stability and unusually high numbers of extreme values.

Hshape: The overall distribution of budget changes should display sharp central peaks and fat tails (i.e. budgets are punctuated).

Partisan Control Model

The PCM provides a straightforward hypothesis in the budgetary context. Leftist governments produce larger shifts within an annual budget, i.e. large budget punctuations, than Rightist parties. This is clearly a contentious hypothesis because it opposes the view that governments of both ideological directions have the potential to inflict massive changes on budgets. The hypothesis, however, can be defended for two reasons. First, Padgett (1980) tells us that once programs have been cut, agencies are reluctant to cut them further. Hence, Rightist governments will find it difficult to implement their budget cuts. Second, government is constantly increasing in size and funding in real currency units. Naturally, this means that there is less room for Rightists to cut funds with the same frequency as Leftist parties raise them. A final constraint of Rightist’s propensity to induce dramatic change is that one of the core preferences of their electorate is fiscal responsibility. In summary, Leftist governments are more likely to be responsible for massive changes in some budget areas which, in turn, results in more punctuated budgets; Rightist governments on the other hand (at least in theory) attempt to be fiscally responsible and hinder governmental growth.
Therefore, governments controlled by Rightist parties should produce a less punctuated budget.

Alternatively, literature on American lawmaking (e.g. Krehbiel 1998) argues that political parties can only bring budgets in line with their preferences during the first year in power and then rely on incremental management of the new equilibrium in the following years. This would imply that only newly-elected governments (regardless of ideological composition) alter a certain set of budgetary functions and thereby produce a punctuated budget.

**H_{PCM}:** Leftist governments are more likely than Rightist governments to have a greater impact on incrementalism and extreme budget change and therefore produce a more punctuated budget.

**H_{EC}:** Newly elected governments model the budget according to their preference and therefore produce a punctuated budget.

**Partisan Distance Model**

The partisan distance model states that the greater the number of veto players and the more divergent the preferences, the more punctuated the budget. The proponents of VPM contend that systems with multiple veto players holding divergent positions present higher levels of stability in policy making than systems with one veto player or a small number of veto players with similar preferences. It follows that the further away the preferences of the players are from the status quo, the greater the possible departure from the status quo and the more dramatic the change. With respect to budget policy, previous governments create the status quo. A majority of budget changes should be marginal because a move away from the status quo requires the accommodation of all veto players. In systems with one or a few veto
players with similar preferences, the necessity to accommodate several veto players is not prevalent. As a result, systems with one or a few homogenous veto players can more easily change budgets. Because players can more easily adjust budgets to their preferences and respond more rapidly to exogenous shocks, the necessity for dramatic change is less pronounced. Few veto players with comparable predilections operate within a rather stable policy space. Instead of stagnating, policy making fluctuates within a small range. In short, this deduction avers that policy change should be less punctuated in systems with one or a few relatively homogenous veto players.

Given that most of the veto points, such as strength of bicameralism as well as existence of judicial review and of referenda, remain constant during the investigated time period, I concentrate on differences within the legislative and executive branch of government. This restriction also seems reasonable because the previously mentioned veto institutions have not contested the annual budget. I modify the VPM model in order to accommodate these limitations. The modification is based on the VPM prediction that a more diverse and ideologically distant set of veto players would lead to greater punctuations. For the partisan distance model (PDM), I examine whether an increase in the distance between the political center of gravity\(^2\) between governing and opposition parties in the legislatures produces higher levels of leptokurtosis of budget distributions. I call this veto player measure the partisan distance. Since a large distance indicates that the government party holds a significantly higher number of seats in parliament and is ideologically committed, I expect that higher kurtosis scores would prevail in this setting.

**H\(_{PDM}\)** The greater the partisan distance between governing and opposition parties, the more punctuated is the annual budget.

\(^2\) The center of political gravity (CPG) is based on the summation across all parties of each party’s relative strength weighted by its ideological position (Gross and Sigelman 1984, Cusack 1997).
Data and Methodology

I test the proposed hypotheses for four countries (Denmark, Germany, the UK and the US) individually and then compare them to each other. Regarding case selection, it is difficult to speculate whether certain countries present most likely or least likely cases a priori. Hence, I rely on a focused comparison (Heclo 1974 is the classic example) of four countries selected for their variation in outcomes of the independent and dependent variables. They also represent four distinct types of democracies (presidential, Westminster, coalition, and minority). Due to German reunification, 1989 is the last year considered here.

The data used for this paper stems from a variety of sources. First, I obtain yearly budget data that facilitates measuring budget punctuation. These data stem from four sources. The US budget data are from the Policy Agendas Project web page (http://depts.washington.edu/ampol/agendasproject.html). For the German data, I use the Federal Ministry of Finance’s Yearly Financial Report (Finanzbericht) (see Bawn 1999: 723). I obtain the data for the UK central government budget from John and Margetts (2003). The Danish data are based on budget appropriations (bevillingen) that are annually published as Finanslov for finansåret by the Danish Finance Ministry. Measures of the independent variables originate from large a data set collected by Cusack and Engelhardt (2002).

The variables described above are operationalized in the following fashion. The dependent variable – the degree of budget punctuation – is computed by using a kurtosis score.4 Kurtosis provides a summary measure of the shape of a distribution (DeCarlo 1997).

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3 Although budget expenditures data is collected by two international organizations (OECD and IMF), this data is inappropriate for this research because of two reasons: (1) expenditures not only represent policy references of policy makers but also include implementation and (2) the level of aggregation does not correspond to actual government functions delineated in national budgets.

4 Statistical literature suggests that the standard kurtosis score is a rickety empirical measure (see Groeneveld 1998); in contrast, the L-moments are an appropriate measurement for this research because they are less sensitive to outliers and reliably computed for a relatively small number of cases (Hosking 1998). See the appendix for a summary of L-moment properties.
and is computed by using the fourth L-moments (Hosking 1990 and 1998). This score ranges from zero to one where an increasing number identifies a higher level of kurtosis, i.e. more punctuation. In order to receive a reliable assessment of the yearly shape, I slide a five-year window over the yearly budget changes at functional level. Because more data points were available for the U.S., I also create a three-year window in this case. Besides the necessity to create a reliable measure of the budget shape, I opt for a three and a five-year window in order to avoid potential complications arising from the four-year electoral cycles. Compared to a yearly shape measure, the window measure should, in theory, “average” the kurtosis scores and therefore the measure presents a higher hurdle to overcome for the independent variables.

In order to measure partisan control, I utilize the measure of the center of political gravity (CPG) of government parties in the legislatures of each country. This is not only the obvious choice for the European parliamentary democracies, but also makes sense in the American case where budget making is largely the responsibility of both houses. Formally,

\[ CPG = \sum_{i=1}^{n} T_i C_i \]

where: \( T_i \) = party \( i \)'s decimal share of seats/votes, and \( C_i \) = party \( i \)'s position on the ideological dimension (Cusack 1997). The measure of CPG and partisan distance is computed by using a composite ideology index based on Castles/Mair, Huber/Inglehart, and Laver/Hunt and ranges from -100 (far left) to +100 (far right). A simple dummy variable for the occurrence of an election year is employed to assess the influence of the electoral cycle. Since the newly elected government passes their first budget in the following year, I lead this variable by one year. For measuring partisan distance, I employ the distance of the CPG scores between non-governing and governing parties in both houses of parliament (the
exception is unicameral Denmark). From the construction of the measurement, it follows that a large positive term indicates a large partisan distance.

- Table 1 about here -

Before employing both graphical and statistical methods for testing the proposed hypotheses, I briefly describe the data (Table 1). On average, budget distributions in the United States (L-kurtosis ≈ .49) display more stability and more dramatic change than those of both other countries (L-kurtosis ≈ .47 for Denmark, ≈ .42 for Germany and ≈ .37 for Britain). On average, the partisan distance is largest in the UK (about 186) and smallest in Denmark (roughly 68). In the US, the partisan distance is about 129 and has a small variance. The mean of German and Danish partisan control measure is relatively close to 0 indicating that these governments are, on average, centrist. The US and UK governments are, on average, more conservative but large fluctuation between Leftist and Rightist dominance prevails.

**Results**

Derived from the PPM, I hypothesize that the overall distribution of budget changes should be punctuated. The L-kurtosis scores for the four countries confirm the visual assessment: the yearly average (Table 1) strikingly indicates that the budget distributions are marked by a large amount of small changes and a considerable number of extreme changes. In short, the overall budget change is punctuated in all four countries. This is especially the case for the United States.

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5 Formally, \(pd = \text{distance (gprimeog,oprimeog)} + \text{distance (uhgideo,uhoideo)}\) where \(gprimeog\) and \(uhgideo\) are the government’s CPG in the lower and upper house, and \(oprimeog\) and \(uhoideo\) are the opposition scores.
Figure 2 displays the development of budget punctuations and illustrates that variation in the degree of budget punctuations prevails over time and across countries. The obvious next question concerns the cause of the variation in budget punctuations. In order to test the hypotheses regarding the determinants of the degree of budget punctuations, I conduct a one period lagged autoregressive\(^6\) time series regression for each of the three countries under investigation. The estimation uses the common Huber/White method for controlling heteroskedasticity. I discuss each model’s prediction (the various models are labeled as \(m1\), \(m2\), and \(m3\)) for each country individually and then draw some conclusions regarding the sources of budget punctuations in the four countries.

Table 2 presents the time-series regression results. Although the coefficients have the hypothesized sign, the regression results show that neither the electoral cycle nor partisan control has a statistically significant impact on budget punctuations in Denmark. Instead, the partisan distance variable is statistically significant but negative. This finding is robust in all three models and suggests that budget punctuations occur in Denmark when government and opposition parties are similar in strengths and preferences. For the German cases, the regressions establish that both partisan control and partisan distance have a significant impact on budget punctuations. Thus, the greater the difference in ideology and strength, the higher the kurtosis score and the more punctuated the German budgets. However, the partisan control coefficient indicates that Rightist governments are also responsible for punctuations.

\(^6\) Not only do diagnostics show a one period autoregressive lag, I expect that realizations of the yearly L-kurtosis scores are a function of last year’s scores. The L-kurtosis score was computed by sliding a five year window across the time line. I also log the dependent variable because is theoretical range is 0 to 1.
Again, the electoral cycle variable is non-significant. The regressions for the UK denote that partisan distance has a statistically significant and positive impact on budget punctuations. Greater partisan distance leads to more punctuated budgets ceteris paribus. In contrast, neither partisan control of government nor the electoral cycle affect shifts within budgets in a statistically significant manner. For the American case, there is some evidence that a shift in partisan control in the liberal direction results in more punctuated budgets. Based on data that uses a three year window to compute punctuations (Table 2 columns I k3), the coefficient for the PCM is in the hypothesized direction and statistically significant. In addition, I do not find evidence for the impact of the variables in the other US models.

Discussion

Overall, graphical and statistical evidence shows that the policy process model rightly predicts that budgets are punctuated. For most of the years and most of the budget areas the change is incremental. However, the high frequencies of small change are interspersed with occurrences of extreme change. A time-series regression analysis finds that different sets of institutions matter in each of the four examined countries. In the U.S., the degree of budget punctuations is largely determined by the partisan propensity for change. During times of Leftist dominance, budgets are more likely to remain stable in some areas while extreme changes occur in other budget areas. This finding for the US cases validates existing literature on American policy making that downplays the role of political parties as a “cost-cutting device”. It also suggests that US scholars may amend existing theories by taking partisan preferences more explicitly into account.

On the other side of the Atlantic Ocean, partisan distance between governing and non-governing parties determines budget punctuations. Evidence from the German and British

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7 This difference in the results might stem from the fact that partisan control changes more rapidly than partisan distance and therefore partisan distance might wash out the effects of partisan control in the regular models.
cases suggests that greater differences in ideology and strength between governing and non-governing parties in parliament lead to more punctuated budgets. For Danish budgeting, I find that the opposite holds true. The regression analysis suggests that greater distance between governing and non-governing parties in the Danish Folketing leads to lower degrees of punctuation.

The two divergent findings on the impact of partisan distance might be explained when additional institutional constraints on policy makers are considered. Blom-Hansen's distinction between political and budget institutions (2001) provides a helpful starting point in this regard. Although not a constitutional rule in Ostrom's (1991) sense, one might consider the relationship of government vis-à-vis parliament as political institutions. This assessment is defensible because of the government's ability to change budget institutions. In other words, "budget institutions are nested within political institutions" (Blom-Hansen 2002, 100). This first concept of institutions was tested in this paper and proves to be important in the European cases.

The second form of institutional constraint centers on the role of budget institutions. At the broadest level von Hagen (1992) and Hallerberg (2004) understand fiscal policy making as a common pool resource problem consisting of three sets of actors: the spending ministers, government, and a subset of members of government belonging to political parties. Depending on the institutional alignment of the three sets of actors, both authors argue that different budgetary institutions produce distinct institutional costs for the budgeting process. Once these additional institutional costs are considered, a more complete explanatory model for explaining budget punctuations might be advanced.

**Conclusion**

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8 Alternatively, this finding might be due to the fact that it is common that all parties agree on the budget in Denmark.
In this paper, I explore one of the central features of democratic decision-making: the annual allocation of funds for government functions. The purpose of this paper is to explain the variation of budget punctuations among advanced industrialized countries. Based on evidence from Denmark, Germany, the United Kingdom, and the United States for the period between the mid-1960s and 1989, I find that budgets exhibit mostly incremental changes punctuated by extreme shifts in allocations. I also find that political institutional constraints determine each country’s distribution of budget changes. Time series regression methods provide strong evidence for the partisan control model in the American cases and overwhelming support for the partisan distance model in the British and German cases. On the other hand, the Danish data suggests that greater distance between government and opposition decreases the degree of punctuations. The Danish case also reminds us that it is important to place partisan and institutional factors in the broader institutional context. Overall, the findings signify that different sets of institutions can still produce similar results. Based on evidence about American budget change distributions, conservative governments provide both less stability and less change. The German and British cases show us that great ideological and numerical divergences between governing and non-governing parties result in punctuations.

This paper aims to highlight that a particular political institution simultaneously contributes to stability and change. The distribution of budget changes in all four cases suggests that the very institutional factors that provide stability to a political system might ultimately be also responsible for a system’s failure. For example, the large and in many countries automated social security spending eventually requires a massive overhaul because their hitherto rigid institutional structure is too statically constructed. That institutions provide both stability and change is overlooked by the veto player literature’s exclusive focus on stability and the political party literature’s predisposition toward change. Proponents of
the policy process models are aware of the phenomenon that institutions produce punctuated policy outcomes. This paper provides a comparative understanding of which institutions contribute to punctuations in budgets and policy more generally.
Literature


Methodological Appendix

Measuring the shape of a distribution

Kurtosis is usually defined as the fourth moment around the mean. This definition can be expressed as

\[ k = \frac{E(X - \mu)^4}{(E(X - \mu)^2)^2} = \frac{\mu_4}{\sigma^4}, \]

where \( E \) is the expectation operator, \( \mu \) is the mean, \( \mu_4 \) is the fourth moment of the mean, and \( \sigma \) the standard deviation. Thus, kurtosis provides a scale free measure of the shape of a distribution but it is sensitive to outliers (Groeneveld 1998). L-moments (Hosking 1990 and 1998) – which are the expected values of linear combinations of order statistics \( X_{(j)} \) multiplied by scalar constants – provide more efficient statistics for distributions (Perez et al. 2003). If \( F(x) \) is a distribution function of a random variable \( X \) and \( X_{(1)} \leq X_{(2)} \leq \ldots \leq X_{(n)} \) are the order statistics associated to the distribution \( F \) (or the ordered values of a single sample of size \( n \)), then L-moments \( L_r(F) \), \( r = 1, 2, \ldots \) are

defined as

\[ L_r(F) = \frac{1}{n} \sum_{j=0}^{n-1} (-1)^j \binom{r-1}{j} E(X_{(j+1)}) \]

The first L-moment \( L_1(F) \) is a measure of location. \( L_2(F) \) is a scale measure for dispersion. The fourth moment (L-kurtosis) is obtained by normalizing \( L_4(F) \) by \( L_2(F) \). Thus, the L-moment ratio \( \tau_4 = \frac{L_4(F)}{L_2(F)} \) measures the kurtosis of a distribution.
Appendix of Figures and Tables

Figure 1. Histograms of all annual budget changes in Denmark, Germany, the United Kingdom, and the United States, 1963 to 1989.
Table 1. Descriptive statistics of the major variables.

<table>
<thead>
<tr>
<th>Country</th>
<th>Statistic</th>
<th>L-kurtosis</th>
<th>Partisan Distance</th>
<th>Partisan Control</th>
<th>Electoral Cycle</th>
</tr>
</thead>
<tbody>
<tr>
<td>DK</td>
<td>Mean</td>
<td>.47</td>
<td>54.36</td>
<td>4.78</td>
<td>.44</td>
</tr>
<tr>
<td></td>
<td>Std. Dev.</td>
<td>.14</td>
<td>10.31</td>
<td>32.01</td>
<td>.51</td>
</tr>
<tr>
<td></td>
<td>Min</td>
<td>.26</td>
<td>24.80</td>
<td>-24.74</td>
<td>.00</td>
</tr>
<tr>
<td></td>
<td>Max</td>
<td>.71</td>
<td>67.65</td>
<td>50.21</td>
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<tr>
<td>GER</td>
<td>Mean</td>
<td>.42</td>
<td>110.25</td>
<td>-3.17</td>
<td>.26</td>
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<tr>
<td></td>
<td>Std. Dev.</td>
<td>.09</td>
<td>25.61</td>
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<td>.45</td>
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<td>141.47</td>
<td>29.84</td>
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<td>UK</td>
<td>Mean</td>
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<td>Max</td>
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<td>191.71</td>
<td>53.68</td>
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<td>US</td>
<td>Mean</td>
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<td>128.63</td>
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<td>.48</td>
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Figure 2. L-kurtosis for annual budget changes in Denmark, Germany, the United Kingdom, and the United States, 1963 to 1989.
Table 2. Time Series Analysis of the Determinants of Budget Punctuations (measured as the log of the annual l-kurtosis).

<table>
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<th>US</th>
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Note: Robust standard errors in parentheses. Two tailed test with p-values: <.05 <.01 ***<.001