PUNCTUATED EQUILIBRIUM AND SUBNATIONAL GOVERNMENTS

Derek Epp

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Approved by:

Frank Baumgartner

Virginia Gray

James Stimson

ABSTRACT

DEREK EPP: Punctuated Equilibrium and Subnational Governments
(Under the direction of Frank Baumgartner.)

Punctuated equilibrium is an increasingly popular theory for explaining budgetary outcomes. To date, studies that rely on punctuated equilibrium frameworks have universally uncovered evidence of government inefficiencies in budgeting. This suggests that the limitations - both cognitive and institutional - that contribute to budget punctuations may be generally immutable. This study seeks to test the limits of government inefficiencies in budgeting by applying a punctuated equilibrium methodology to study the budgets of subnational governments in the United States. I find that punctuations are relatively constant across all population levels. Small cities and counties do not appear inherently more efficient at budgeting than their larger counterparts.

ACKNOWLEDGMENTS

First and foremost I would like to thank Frank Baumgartner, my thesis advisor. It was his guidance and patience that made this work possible. I would also like to thank the other members of my committee - Virginia Gray and Jim Stimson - who provided valuable feedback. Finally, thank you to Jeff Harden and John Lovett who answered many many formatting questions.

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Introduction

How well does a government govern? Often it is fairly easy to identify governments that are seriously bad. More difficult is categorizing all the governments between just normally bad and good. While a comprehensive measure of "good government" may be beyond current academic sensibilities, we can devise accurate measures of various characteristics that we believe good governments should have. One such characteristic is responsiveness. How quickly can government process the emergence of an issue and take action?

The study of budgeting, and punctuated equilibrium theory in particular, is at the forefront of efforts to answer this question. If budgeting allows governments to "put their money where their mouth is", then punctuated equilibrium allows political scientists to measure how eloquently they speak. In other words, punctuated equilibrium theory affords scholars a measure of the efficiency with which governments process and respond to problems.

This paper applies a punctuated equilibrium framework to local governments - states, counties, and cities - in an attempt to test the limits of government inefficiency. It proposes that as the complexities of governing decrease in relation to population, governments should become more efficient at budgeting. The use of a Census Bureau dataset, which includes 19,000 United States cities, 3,000 United States counties, and 16 spending categories, facilitates this analysis.

Ultimately, I will conclude that budgets are inefficient across all types of government, population, and spending category. This suggests that limits - both institutional and cognitive - that operate on government and cause inefficient outcomes are powerful and inflexible. It also raises normative questions about the ability of governments to govern "well" in this particular regard.

Background

The study of budgets has a long history in political science dating back through the 1950s. For much of this history the dominant theory used to explain budget changes was incrementalism. Essentially, to understand this year's budget, the best place to look is last year's budget. Incrementalist theory has many appealing components, but also a few flaws.

Beginning with the positives, incrementalism fits well with notions of practicality and temporal limitations. Imagine legislators stripping the budget down to zero and starting from scratch

each year. What an impossibly tedious, time-consuming, costly and unnecessary process that would be. A better strategy is to start with last year's budget, and gradually adjust spending as necessary. At the national level, the existence of large formulaic entitlement programs and constraining budget rules lend their support to an incremental understanding of budget change (Davis 1966; Lindblom 1959; Davis and Wildavsky 1974; Dempster and Wildavsky 1979; Wildavsky 1974; Hayes 1992).

Incrementalism also finds support in interest group conflict. One interest group's success is often another's failure. This may result in negative feedback loops where countermobilization efforts minimize the extent to which budgets change (Baumgartner and Jones 1993). Finally, incrementalism finds support in empirical research on state programs, such as welfare, health care, and education (Gray and Hanson 2004; Barrilleaux and Langer 2002). These studies find that budgets associated with specific policy issues appear largely incremental.

Incrementalism's primary flaw is a limitation. Specifically, it fails to explain why budgets sometimes change dramatically in size. As the data and methods available to political scientists improved it became clear that occasionally budgets will experience huge fluctuations (Schulman and Pomper 1975; Berry and Lowery 1990; Gist 1977, 1978; Kamlet and Mowery 1980). Policy issue by policy issue these large changes can be dismissed with reference to specific historical contexts. But when spending across all issues is aggregated it becomes apparent that severe budget adjustments are a fundamental part of the budgetary process. Frank Baumgartner and Bryan Jones were among the first to formally demonstrate this by aggregating federal budget outcomes across spending categories delineated by the Office of Management and Budget from 1947 through 2008 (Jones and True 1998). Their observations led them to adapt the theory of punctuated equilibrium to explain the federal budgetary process (Pagett 1980; Jones and Larsen 2003; Jones and Baumgartner 2005).

The theory of punctuated equilibrium originates with paleontologists who were curious that the fossil record seems to exhibit long periods of evolutionary stasis followed by brief periods of rapid change. This evidence contradicted the dominant theory in evolutionary biology going back to Darwin, which was that evolution is a methodical and relatively constant process. In an attempt to describe the fossil record, scientists developed the idea that evolution occurs in a largely incremental equilibrium until it is punctuated by sudden leaps forward (Eldredge and Gould 1972).

The strength of punctuated equilibrium as it applies to budgetary processes is that it can explain budget data at a case specific and macro level, while incorporating key components of incrementalist theory. For instance, both punctuated equilibrium and incrementalism rely on

bounded rationality to explain budgetary outcomes. Incrementalist theory suggests that limits on human cognitive abilities are a big reason why legislators are so dependent on past budgets when making contemporary budget decisions. Punctuated equilibrium theory uses bounded rationality in much the same way, except it sees it as part of a larger range of frictions, which include attention scarcity, agenda and time constraints, legislative gate-keeping, lobbyists, and competing interest groups. Together these frictions slow up the congressional works creating a strong status quo bias. Jones and Baumgartner explain friction in *The Politics of Attention*:

> "There is an extreme allegiance to the status quo simply because we are so overloaded with choice opportunities, problems, and complex issues that we cannot deal with any but a small fraction of the ones that probably deserve some attention. While this allegiance to the status quo may be ideological, it does not have to be. A powerful status quo bias would exist even in the absence of ideology, because it is based in human cognition and then exacerbated in organizational settings by missions and bureaucratic procedures" (Jones and Baumgartner 2005).

In many ways then punctuated equilibrium and incrementalism are in agreement over what causes the incremental part of budgets. The value added of punctuated equilibrium is that it is equipped to explain spending punctuations as well. Much like an earthquake is the release of slowly building geologic frictions along a fault line, budget punctuations can be explained in terms of institutional friction. These frictions prevent legislatures from adequately addressing problems as they arise in society. When members of a legislature do get around to addressing a particular problem, they often find it worse than expected, and lacking perfect or even good information, deal with it authoritatively. This process of fits-and-starts results in generally incremental budgets that are occasionally punctuated by spending fluctuations.

Contemporary Applications

Scholarship by Baumgartner and Jones originally focused on federal budgets in the United States, but it was not long before scholars began applying punctuated equilibrium theory to different types of governments and budgets. To date, studies have shown that the national budgets of Denmark, Belgium, France, Germany, Canada, and Great Britain display the same pattern of punctuated equilibrium seen in the United States (Jones et al. 2009; Baumgartner 2009) A recent study by Chrisitian Breunig and Chris Koski examines the budget outlays of all 50 U.S. states from 1984 through 2002 across 10 spending categories. They find that while every state budget is subject to punctuated equilibrium, the extent of the punctuations vary across states

and spending categories (Breunig and Koski 2006).

Other scholars have gone beyond states and found evidence of punctuated equilibrium occuring among local school districts (Robinson 2004). Meagan Jordan provides evidence of punctuated equilibrium at the municipal level by examining the budgets of 38 large U.S. cities from 1966 through 1992 across six spending categories. Like Breunig and Koski, Jordan concludes that punctuations are not constant across spending categories. She proposes that allocative spending categories - police, fire, sanitation - tend to be more stable than developmental categories that get much of their funding from a higher level of government - parks, public buildings, highways (Jordan 2003).

Hypotheses

The hypotheses I introduce build directly upon previous punctuated equilibrium scholarship. In particular, I am interested in contributing to the literature that examines budget punctuations at the subnational level. This literature borrows much of its theoretical framework from Baumgartner and Jones' original study on federal budgeting (1998). It assumes that the institutional frictions that slow the responses of the federal government are also present to varying degrees on state and local levels. This assumption rests on the universality of institutional and cognitive limitations. Specifically, members of state and local governments are subject to similar frictions - gatekeepers, bicameral legislatures, partisan politics, lobbyists, interest groups, and judicial systems - as their federal counterparts. Likewise, actors at every level of government are still human, and therefore exercise boundedly rational decision making. Together, these similarities suggest that state and local budgets should also shows signs of punctuated equilibrium. This reasoning leads to my first hypothesis:

At every level of government - city, county, state - and across all spending categories, budgets will display evidence of punctuated equilibrium.

This hypothesis is hardly unique. It exists, in some form or another, in most articles about punctuated equilibrium. Still, it is a necessary starting point for developing more complex hypotheses. Given the literature on budgets at state and local levels, which finds punctuations in every case, I highly anticipate confirming this hypothesis. As discussed, institutional frictions are going to be present at all levels of government. Furthermore, spending in one budget category is not independent of spending in another, even if the categories appear unrelated (Breunig and Koski 2006; Jones and Baumgartner 2005). This suggests that budget punctuations will exist to some extend across all categories.

My second hypothesis also comes directly from the literature:

The extent of budget punctuations will vary across levels of government and between spending categories.

This is mostly straightforward. It would, in fact, be rather remarkable if punctuations were constant across levels of government and between spending categories, as this would suggest a consistency in budgeting processes hitherto unsuspected. The interesting question is how do budgets vary, and is there any discernible pattern to this variance?

My third hypothesis seeks to answer this question:

As organizational and issue complexities decrease, the friction impacting government institutions will lessen. This will result in an observable pattern where budget distributions will approach normality as the simplicity of budgeting processes increases.

Although institutional and cognitive frictions are present at every level of government, the intensity of these frictions varies. For instance, consider the diversity of issues facing New York City. The cross pressures New York City legislators face, and the complexities of managing such an immense urban area create an environment ripe for the sorts of frictions that result in punctuated equilibrium. By comparison, budgeting in Chapel Hill seems relatively straightforward. The population is much smaller and more uniform, and the scope of issues that a budget might be expected to address is more limited. In general, as populations increase, I expect frictions to increase.

Friction can also vary across spending categories. What, for example, is the primary role of a fire department? Most would probably agree that it is to put out fires. Following this in some order might be responding to traffic accidents, promoting fire safety and rescuing pets. Now, what is the primary role of the police department? To stop crime, but crime can be a complicated thing. Should our police officers dedicate their scare resources first and foremost to traffic safety, or emergency calls, or apprehending burglars, or preventing drug violence? We want the police to do all of these things, and herein lies the friction. With limited financial resources at their disposal, legislators must make some hard political choices about when and how to adjust police department budgets.

Given frictional variance, it is possible that at some level of government, across certain spending categories, budget distributions can approximate normality. I am suggesting that this is most likely to occur in small cities and counties, where the diversity of issues facing government is severely limited. At this level, even frictions associated with bounded rationality may slacken as the number of decisions facing legislators becomes manageable. Whether or not a normal

budget distribution can be found, I propose that the extent to which budgets display evidence of punctuated equilibrium will decrease as populations decrease. I also propose that evidence of punctuated equilibrium will be relatively constant for each spending category across population and level of government. For example, if spending on police departments shows more evidence of punctuated equilibrium than other spending categories in large cities, this should also be true of medium and small cities.

My third hypothesis can tell us some interesting things about the condition of government. To this point every macro level analysis of government budgeting has shown evidence of punctuated equilibrium. If we take seriously the theoretical implications of these results they suggest that governments are not very efficient at drafting budgets, or indeed at addressing society's problems as they arise. Previously, the smallest level of government considered in a punctuated equilibrium framework was 38 cities of at least 300,000 people (Jordan 2003). This paper is unique by providing a first glimpse at the budgeting processes that take place at even smaller and more limited levels of government. By mapping the budget outlays of thousands of cities and counties of varying size across 16 spending categories, I can provide a wealth of comparisons across local governments. If, as I hypothesize, evidence of punctuated equilibrium declines as we move down the population scale and reach smaller and smaller levels of government, this will suggest that government inefficiencies are not immutable and that frictions can to some degree be overcome.

Data

The dataset this study employs spans from 1970 through 2006 across three levels of government - city, county, state - and 16 spending categories: corrections, education, financial expenditures, fire, judicial, health, hospitals, highways, housing and community development, libraries, natural resources, parking, parks and recreation, police, property development, and welfare. All of this data, and the explanations for the spending categories, are available through the United States Census Bureau's *State Government Finances* directory. Table 1 displays some basic descriptive statistics.

The first thing to note from Table 1 is that the dataset is large - the largest brought to bear in a subnational punctuated equilibrium study. This allows me to make comparisons across spending categories, as previous studies have done, and across levels of government and populations. Specifically, I have 19,032 different cities or towns, 3,044 different counties, and the standard 50 states to work with. Also of import is that this dataset displays considerable variance, particularly at the city and county levels. This means that I have a lot of leverage when testing my third hypothesis - that complexities associated with population should result in distinct

budget patterns. Finally, note that the state data begins in 1977 instead of 1970 as is the case for cities and counties. This is simply a characteristic of the Census dataset as available through the *State Government Finances* directory.

Table 1: Descriptive statistics

Level of government	**Unique observations**	**Years**	**Pop. Min.**	**Pop. Max.**	**Pop. Mean**
City	19,032	1970-2006	50	8,143,197	14,871
County	3,044	1970-2006	62	9,935,475	93,450
State	50	1977-2006	302,583	35,885,415	5,013,768

Note: Populations less than 50 are excluded

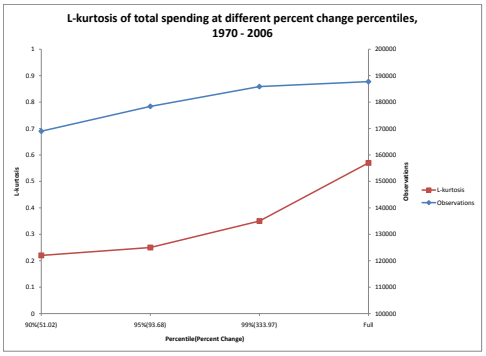
Before doing any hypothesis testing, I make three data adjustments to increase the accuracy and robustness of my results. The first, as noted in Table 1, is to drop cities and counties that the Census lists as having populations of less than 50 people. This dataset in its original form lists approximately 250 such areas, some of which have reported populations below 10. While the difference between a city of 50 people and a city of 51 is negligible, this cutoff must exist at some low number to safeguard against potential inaccuracies in the Census dataset. The next step I take is to adjust expenditures to 2006 dollars using inflation charts available through the *Policy Agendas Project*.

The final piece of data management is also the most complicated. A consequence of using a dataset that includes small cities and counties is the potential for small levels of absolute spending to cause enormous measures of percent change, which in turn create high measures of l-kurtosis[1] . As a hypothetical example, suppose a small city employs one part-time police officer who in a given year replaces his squad car and causes city expenditures on police to go up by 30,000 percent. This sort of small budget punctuation is not appropriate to punctuated equilibrium theory as it is used and understood in the literature.

Figure 1 graphs l-kurtosis values across different levels of percent change for the total spending distributions of cities and counties. Total spending is simply the sum of all 16 spending categories from 1970 through 2006. Note the sharp drop in l-kurtosis when the 99th percentile is dropped from the data. This shows the power the top one percent of the percent change distribution has on l-kurtosis.

[1] More on the definition and use of l-kurtosis to follow.

Fig. 1: L-kurtosis by expenditure percentile



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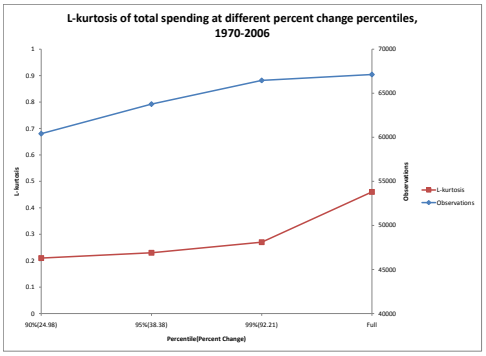


[County]

When I search the data for the source of these extreme changes, I find that they are fairly evenly distributed across population and expenditure. This, in itself, is not a problem - huge measures of percent change are only a theoretical issue when they occur at low levels of expenditure. To avoid overly biasing my measures of l-kurtosis with small city and county budgets I drop from the data observations that fall below the 5th percentile of expenditures, while simultaneously falling above the 99th percentile of percent change. This ensures that the large measures of percent change that remain in the dataset exist only among levels of expenditure big enough to be theoretically relevant[2] .

Methods

Fundamental in the application of punctuated equilibrium theory to budgetary processes is the central limit theorem (CLT), which holds that independent random variables that are identically distributed will, in large enough quantities, be normally distributed. Given the CLT, Baumgartner and Jones (1998) suggest that the aggregated budgetary adjustments required by all the issues, problems, and social pressures facing the government should be normally distributed. In

[2] The states do no have a small budget problem and are not included in this data management.

other words, a government that could respond in perfect sufficiency to all the issues begging its attention would produce budgets that when aggregated approximate normality. The degree to which actual budgets punctuate, or deviate from normality, can serve as general assessment as to a government's efficiency in responding to problems through budgeting.

A standard measure of a distribution's shape is kurtosis, which is formally understood as the standarized fourth population moment about the mean. A normal distribution has a kurtosis of three, and as this number increases a distribution becomes more leptokurtic in shape. Leptokurtic distributions are characterized by high central peaks, small shoulders, and fat tails. These are the tell-tale signs of punctuated equilibrium as the high peaks are indicative of overabundent incremental change, and the fat tails indicative of sudden punctuations. Thus leptokurtic distributions and punctuated equilibrium are closely linked in the literature, and kurtosis becomes the primary statistic with which to measure a government's budgetary efficiency.

A drawback to relying on measures of kurtosis for analysis is the statistic's sensitivity to outliers. This is well documented in both the punctuated equilibrium and statistical literatures. The typical solution is to use measures of kurtosis based on L-moments, which are more robust aganist outliers. This produces a statistic known as l-kurtosis, which ranges from 0 to 1. A normal distribution has a l-kurtosis of .123, and again, higher values indicate more leptokurtosis (DeCarlo 1997; Jones and Baumgartner 2005; Breunig and Koski 2006; Groneveld 1998).

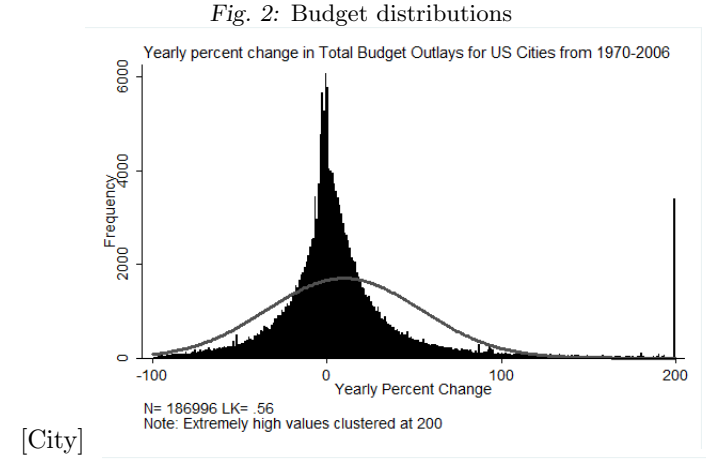
I proceed by putting my dataset into time series format and calculating a percent change variable for each spending category across all three levels of government. For example, I take the amount spent on education by each city in 2000, minus city education spending in 1999, divided by city education spending in 1999. The end result is that for each year (excepting the principal years) every city, county and state has a percent change variable indicating how much spending changed from one year to the next across all 16 spending category. I then pool these yearly percent changes across levels of government and spending categories to determine the l-kurtosis of the subsequent distributions, which in turn enables me to assess the degrees of budget punctuation. This methodological approach is standard in punctuated equilibrium articles since it was introduced by Baumgartner and Jones (1998). By adopting it here, I can easily compare my results to those from other studies.

Hypothesis Testing

My first hypothesis is that there will be budget punctuations at every level of government and across all 16 spending categories. Figure 2 shows total expenditures, from 1970 through 2006 for cities and counties, and from 1977 through 2006 for states. Note that in all three of these

figures, the distributions are not at all normal. A normal distribution will have a l-kurtosis of .123. Here cities have a l-kurtosis of .56, counties .46 and states .18.

Fig. 2: Budget distributions



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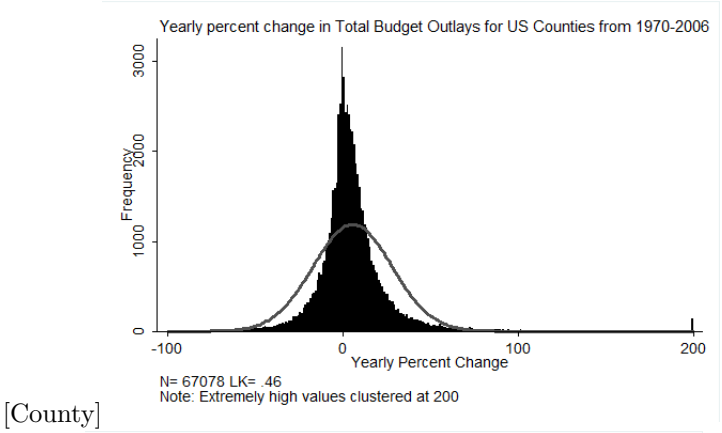

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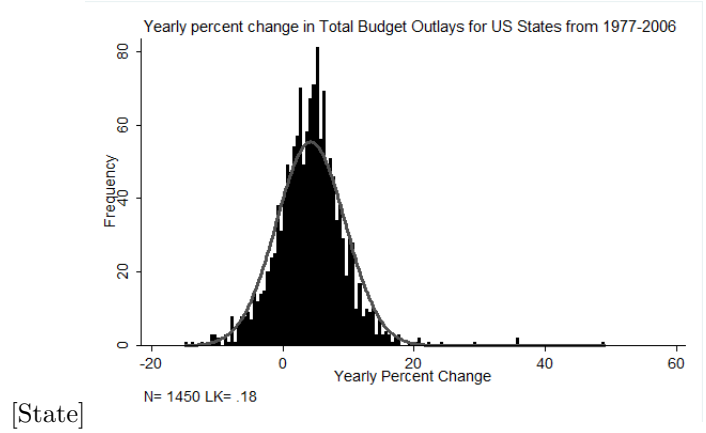
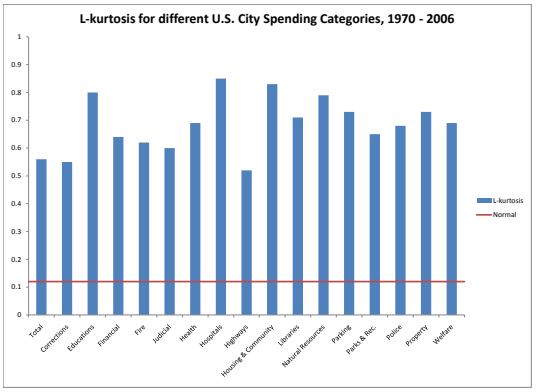


[State]

Figure 3 displays the l-kurtosis for each of the 16 spending categories by city, county, and state. Note that none of these spending categories display values of l-kurtosis associated with a normal distribution at any level of government.

Fig. 3: Budget distributions



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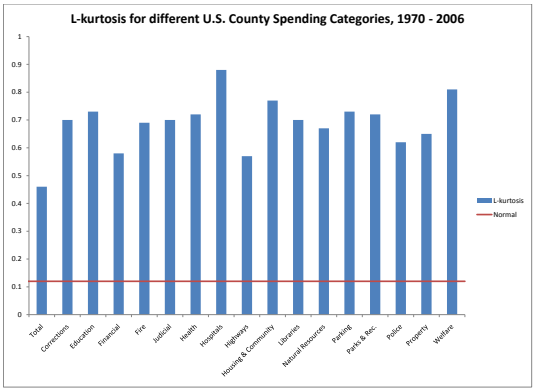

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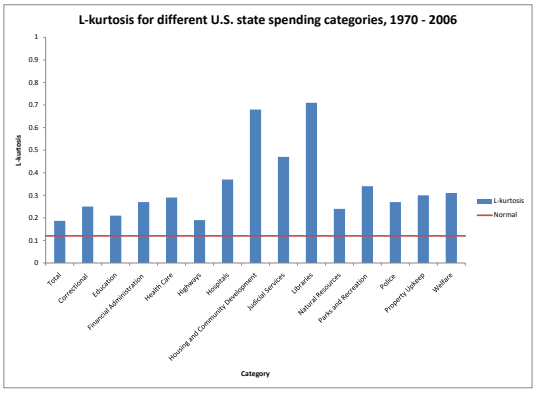


[State]

Confirmation of the results Figures 2 and 3 display can be had by conducting Shapiro-Wilks tests on the distributions all of 16 spending categories for each level of government. The Shapiro-Wilk method uses a goodness-of-fit test to determine the probability that a given frequency distribution could have come from a normal distribution. It produces a W statistic, which can be evaluated using standard p-values. The lower the W statistic the less likely the observed distribution originated from a normal distribution (Breunig and Koski 2006). The results are

presented in Table 2, along with measures of kurtosis and l-kurtosis.

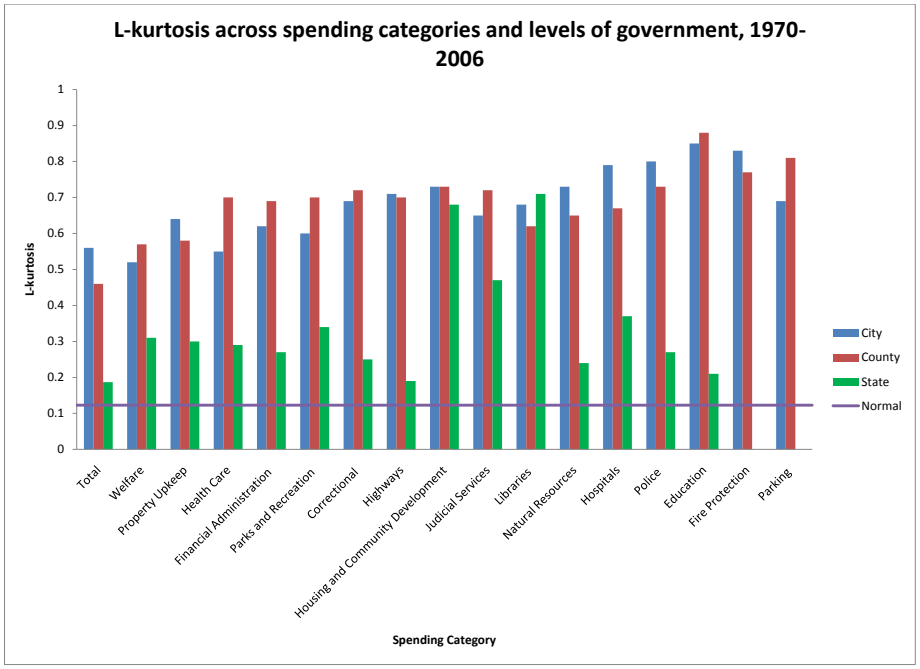
Table 2: Shapiro-Wilk and kurtosis across government and spending category

City	**Kurtosis**	**L-kurtosis**	**S-W test (W)**	**P-value**
Total	30,575.14	0.56	.016	0.00
Corrections	3,201.28	0.55	.061	0.00
Education	5,944.09	0.80	.014	0.00
Financial Admin.	37,569.08	0.64	.044	0.00
Fire	22,906.84	0.62	.025	0.00
Judicial	9,404.46	0.60	.038	0.00
Health	14,641.60	0.69	.028	0.00
Hospitals	2,292.80	0.85	.020	0.00
Highways	87,416.18	0.52	.032	0.00
Housing and Comm.	861.95	0.83	.037	0.00
Libraries	33,511.31	0.71	.009	0.00
Natural Resources	4,567.39	0.79	.025	0.00
Parking	6,109.26	0.73	.029	0.00
Parks and Rec.	66,523.17	0.65	.005	0.00
Police	34,315.37	0.68	.013	0.00
Property	27,466.58	0.73	.007	0.00
Welfare	4,967.42	0.69	.029	0.00
County	**Kurtosis**	**L-kurtosis**	**S-W test (W)**	**P-value**
Total	59,974.45	0.46	.005	0.00
Corrections	15,078.72	0.70	.025	0.00
Education	2,912.72	0.73	.041	0.00
Financial Admin.	48,184.79	0.58	.005	0.00
Fire	2,674.52	0.69	.067	0.00
Judicial	12,113.19	0.70	.013	0.00
Health	41,200.96	0.72	.011	0.00
Hospitals	6,168.47	0.88	.012	0.00
Highways	13,566.53	0.57	.012	0.00
Housing and Comm.	594.13	0.77	.079	0.00
Libraries	15,396.00	0.70	.023	0.00
Natural Resources	2,798.12	0.67	.084	0.00
Parking	604.25	0.73	.113	0.00
Parks and Rec.	19,218.35	0.72	.014	0.00
Police	45,114.26	0.62	.014	0.00
Property	2,489.79	0.65	.063	0.00
Welfare	13,661.39	0.81	.010	0.00
State	**Kurtosis**	**L-kurtosis**	**S-W test (W)**	**P-value**
Total	8.92	0.18	.956	0.00
Corrections	8.80	0.25	.901	0.00
Education	8.38	0.21	.952	0.00
Financial Admin.	69.04	0.27	.748	0.00
Judicial	95.54	0.29	.441	0.00
Health	17.75	0.19	.859	0.00
Hospitals	321.65	0.37	.477	0.00
Highways	4.79	0.68	.974	0.00
Housing and Comm.	938.49	0.47	.081	0.00
Libraries	1,271.34	0.71	.036	0.00
Natural Resources	8.01	0.24	.929	0.00
Parks and Rec.	46.43	0.34	.676	0.00
Police	30.82	0.27	.814	0.00
Property	29.89	0.30	.789	0.00
Welfare	129.73	0.31	.572	0.00

Together, Figures 2 and 3 and Table reftable2 confirm my first and second hypotheses. Budgets are punctuated across spending categories and levels of government, and the degree of punctuation varies. These hypotheses were highly supported by the literature, so it is not surprising that they are confirmed.

My third hypothesis - that there should be patterns of l-kurtosis based on population - can be tested by comparing the l-kurtosis of each level of government across all 16 spending categories. This is what Figure 4 does. If this hypothesis is correct then in general states should have the highest levels of l-kurtosis, followed by counties and finally cities. This purported trend reflects the decreasing complexities associated with governing smaller populations, which in turn imply fewer institutional and cognitive frictions, and therefore less punctuations. As Figure 4 illustrates this trend finds no support from the data. States have by far the least amount of l-kurtosis, and no distinct pattern emerges between cities and counties. Furthermore, there does not appear to be any consistent pattern across spending categories. Categories with high l-kurtosis at one level of government do not consistently have high l-kurtosis at the other two types of government. The same can be said of categories with low and mid-level l-kurtosis.

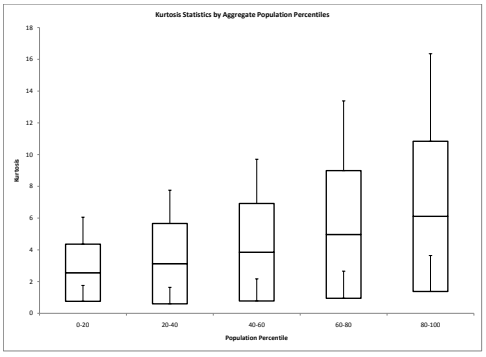
Fig. 4: Cross government comparison



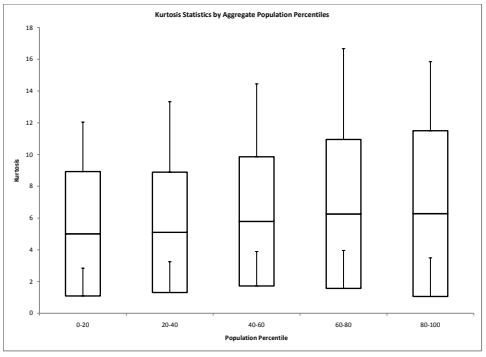
Finding no support for the third hypothesis with cross governmental comparisons, I proceed

by measuring kurtosis within both city and county governments [3] . Figure 5 compares the kurtosis from the total spending distributions across five aggregate population percentiles for both cities and counties [4] . The center line of the box plots measures the mean, the edges of the boxes are one standard deviation from the mean in either direction, and the whiskers are the kurtosis values at the 5th and 95th percentiles. According to my hypothesis the kurtosis means should be greater and statistically distinct as population size increases - so from left to right across the x-axis. While it appears that average kurtosis does increase as population increases, the large standard deviations indicate that these measures are not statistically different from each other. In fact, the standard devations are so large that they extend past the kurtosis values at the 5th percentile. This finding does little to support my third hypothesis.

Fig. 5: Kurtosis by population percentile



[City]



[County]

I therefore confirm two of my hypotheses and fail to support the third. Based on this data and analysis it appears that population has little to no impact on the efficiency at which a government operates. More specifically, a small government is at least as inefficient at budgeting across all 16 spending categories as a large government.

[3] Note that for this analysis I use kurtosis scores in favor of l-kurtosis. This switch is for computational purposes. Also, states are excluded from this analysis as the variance between high and low population states is relatively small.

[4] The distributions for total expenditures are representative of the trend found for all 16 spending distributions.

Conclusion

Every study on punctuated equilibrium that I am aware of finds evidence of government inefficiency through leptokurtic budget distributions. I tried to break this trend by examining small local governments across 16 different spending categories. The idea being that among cities and counties with small populations, the impact of institutional and cognitive frictions will lessen. This in turn allows these cities and counties to budget efficiently, or at least more efficiently than their large population counterparts.

Seemingly this is not the case. I find that budgets display sizable amounts of leptokurtosis across all levels of government and 16 spending categories regardless of population. Consider the implications of this from a "good government" perspective. Even the smallest cities and counties in America do not budget efficiently when it comes to their police departments or fire departments or indeed any known spending category. The consistency of inefficient outcomes speaks to the power of both institutional and cognitive limitations. This paper provides preliminary evidence that suggests these limitations are generally constant. Perhaps they can not be avoided at all, in which case government institutions are naturally inefficient at budgeting.

Fortunately, the case is far from closed. Population is only one way of operationalizing complexity. Other variables deserve consideration. For instance, the strength of network ties within a legislature, the presence and rigidity of budgeting rules, population demographics, partisanship, and power of the executive, are all dimensions that might lead to more or less complex budgeting environments. It may be that the route to efficient budgeting lies with any one, or more likely a combination, of these variables. Other ways forward include analyzing the budgets of private corporations. Punctuated equilibrium scholars have been finding inefficiencies in government for some time now. It may be interesting to focus on the private sector. If punctuated equilibrium patterns exist among corporations, it would speak to the power of institutional and cognitive limitations, and suggest that inefficient budgeting is a common hallmark of human enterprise.

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