

# **Incrementalism in Appropriations: Small Aggregation, Big Changes**

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## **Incrementalism in Appropriations: Small Aggregation, Big Changes**

The stability of the U.S. federal budget, as a substantively important attribute and as an insight into the decision process of the legislature and bureaucracy, has led to a scholarly focus on incrementalism, defined by small year-to-year changes. However, what constitutes ‘small’ has been largely left unspecified. Furthermore, previous research has been unable to assess incrementalism across multiple levels of aggregation. Using a unique budgetary database, we examine whether budgetary changes are in fact ‘small’ at different levels of aggregation, finding that a surprisingly low proportion of the changes are actually small by any logical standard. Most years, more than twenty percent of budgetary changes are greater than fifty percent and nearly half are greater than ten percent. The level of aggregation is also important for assessing whether political variables influence incrementalism. We show that party control manifests in micro-level budget decisions, while divided government manifests in aggregate-level budget decisions.

## **Incrementalism in Appropriations: Small Aggregation, Big Changes**

Debated and passed every year, the U.S. federal budget is intriguing to researchers because the outcome of the budget process fundamentally affects policy implementation and because the repeated process provides a unique window into congressional and presidential decision-making. This interest in the budget has spawned a vast literature focused on the incremental nature of budgeting, which is important to understand for at least two reasons. First, on the policy side, an incremental budget is characterized by a stability that has implications for policy implementation (Hou 2006). There is a potential trade-off between stability and responsiveness of government policy that may be evident in the level of incrementalism. Second, whether the budget is incremental may be informative about the decision-making process. For example, Wildavsky (1992) links incrementalism to consensus and large changes to dissensus.

But in answering the question of whether the budget is characterized by incrementalism, there are two definitional problems. First, models of the budget are uninformative about the exact definition of the small changes expected under incrementalism. Scholars have used definitions of small ranging from 2% to 30%. We examine whether the budget appears incremental using a range of definitions and assess whether the budgetary changes are in fact ‘small.’ We find that a surprisingly low proportion of the changes are actually small by any logical standard. Most years, more than sixty percent of the budgetary changes are greater than five percent and nearly half are greater than ten percent. This calls into question the characterization of the budget as incremental, at least in terms of small year-to-year changes.

Second, the testing of models of the budget generally fails to carefully consider the level of budget decision-making at which we should observe incrementalism. Should we observe incrementalism at the disaggregated subaccount level or should we only observe it when the budget is aggregated to the agency or appropriations bill level? We find marked differences in the degree to which the budget can be characterized as incremental at different levels of aggregation. At the most aggregated (appropriations bill) and most disaggregated (subaccount) levels, the budget appears less incremental than at intermediate (agency or subfunction) levels of aggregation. An analysis of incrementalism at different levels of aggregation can help to uncover the underlying dynamics of budgetary decision-making.

We illustrate two overlooked instances in which the answers to questions about the politics of the budgetary process, like whether changes in party control or the presence of divided government play a role in incrementalism, depend heavily on the level of aggregation. Appropriate model-testing, and the subsequent real-world applicability of the results, hinges on testing models at the level of aggregation that is consistent with the assumptions of the model. If party dynamics are at work in the drafting of appropriations legislation, these should manifest at the disaggregated level, while macro-level divided government hypotheses should be tested at higher levels of aggregation. Consistent with this, we find that changes in party control predict incrementalism only at the most disaggregated level and divided government predicts incrementalism only at the more aggregated level.

After critically evaluating existing definitions of incrementalism, focusing on the levels of aggregation and restrictions on the size of small changes, we present empirical findings characterizing the degree of incrementalism under the various definitions. We then show that the

conclusions from model testing also vary by the level of aggregation. We end with a call for better theoretical justifications of the empirical specifications used in the study of budgeting and show how attention to the appropriate level of aggregation helps us to understand the drivers of policy outcomes.

### *Incrementalism*

Answering the question of whether the budget is characterized by incrementalism requires an operational definition of incrementalism. While many definitions of incrementalism have been proposed, ranging from a focus on process (Bendor 1995; Dahl and Lindblom 1953; Patashnik 1999) to a focus on outcomes (Lindblom 1979) see Tucker (1982) and Berry (1990) for overviews), most empirical analyses have, as we do, ultimately measured incrementalism via outcomes. The distinction between incremental processes and outcomes is an important theoretical distinction, but one that has been unable to gain much empirical traction (Bailey and O'Connor 1975). Among the problems in classifying budgeting as an incremental process are the size of uncontrollable items in the budget, which precludes incremental strategies because there is no control over dollar allocations (Gist 1974; Gist 1977), and the increasing role of multi-year authorizations (Gist 1977; LeLoup 1978). Additionally, many scholars have noted that an incremental outcome can occur in the absence of an incremental process, and can even be generated by random data (Wanat 1974). On the flip side, an incremental process can, in theory, produce both large and small changes in outcomes (Bailey and O'Connor 1975; Dahl and Lindblom 1953).

Therefore, like many scholars before us, we focus on the appropriateness of incrementalism as a descriptive characterization of budget outcomes. We focus on these

budgetary outcomes (appropriations) and seek a satisfactory definition of incrementalism, which has typically come to reference small changes as well as a limited set of policy alternatives (Fenno 1966; Wildavsky 1974). While theoretically the emphasis has been on ‘small’ changes, many scholars have been rather expansive in their own empirical specifications of what constitutes ‘small’ and, thus, what would be predicted by an incremental model. Allowing for the moment these expansive definitions of incrementalism, there is ample evidence of incrementalism in the Congressional budgeting process (Bailey and O'Connor 1975; Bozeman and Straussman 1982; Cowart, Hansen, and Brofoss 1975; Davis, Dempster, and Wildavsky 1966; Dempster and Wildavsky 1979; Fenno 1966; Gist 1982; Jones, True, and Baumgartner 1997; Kamlet and Mowery 1980; Kamlet and Mowery 1987; Kemp 1982; Lowery, Bookheimer, and Malachowski 1985; Natchez and Bupp 1973; Wildavsky 1974), in state legislature budgeting (Sharkansky 1968), in international governmental organizations (Hoole, Job, and Tucker 1976), and in educational spending within Texas (Robinson et al. 2007).

While our work does not dispute the importance of any of these studies, we focus on two limitations that have prevented comparison of past analyses, namely inconsistent definitions of what constitutes a small change and inconsistent levels of aggregation. Although the smallness of the change is not the key aspect of incrementalism in every analysis, it is a common definitional component and probably the least common denominator for assessing incrementalism. But no scholars provide a definitive answer to what proportion of changes must be small in order for the budgetary process to be considered incremental, thus making

incrementalism a difficult hypothesis to reject.<sup>1</sup> The closest thing to a firm definition of an incremental outcome is +/- 10% (LeLoup 1978) but this cutoff is not consistent across analyses. We compare the characterization of the budget as incremental under various definitions of small. We use cutoffs of 1%, 5%, 10%, 20%, 30%, 40%, 50% and 100% to show how the size of changes considered can affect conclusions about the degree to which the budget is incremental.<sup>2</sup>

In addition, the level of aggregation that is used may affect the characterization of the budget as incremental. Scholars of incrementalism have tended to focus on the agency level. However, the risk of using this high level of aggregation “is that variation is often masked, gains and losses by competing programs cancel each other out in the totals, and that has a tendency to bias results toward incremental interpretations” (LeLoup 1978, 498). Previous work has highlighted the need to examine multiple stages of the policy making process or multiple levels of aggregation (Gist 1974; LeLoup 1978), but they have typically been unable to extend this type of analysis beyond a single department or a single period in time. For instance, LeLoup and Moreland (1978) examine Department of Agriculture agencies from 1946 to 1971 to compare the budgetary decisions made by agency heads, the Office of Management and Budget, and

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<sup>1</sup> Alternative explanations for budgetary policy making also include the size and frequency of changes as a key component. For example, the punctuated equilibrium theory of Baumgartner and Jones (1993) incorporates both incremental and non-incremental changes, where the latter are possible but rare. Although this theory is equally difficult to disprove since only frequent large changes or the absence of large changes can refute the theory, scholars have assessed the distribution of changes relative to the normal distribution for evidence to discriminate between the two theories. For instance, True, Jones, and Baumgartner (1999) suggest that the leptokurtic distribution would be evidence of a punctuated equilibrium process. Robinson et al. (2007) apply this framework to educational spending in Texas, arguing that a punctuated process would result in a high number of small changes, a small number of medium changes and a moderate number of large changes. In contrast, an incremental process would result in predominantly small changes, with few medium or large changes. They determine the cut-points for small, medium and large by overlaying a normal distribution and looking at the intersections. With small defined as changes between -2% and +10%, Robinson et al. find that 60% of changes are small, 37% are medium, and less than 2% are large. Thus, they conclude that incrementalism rather than a punctuated process is at work.

<sup>2</sup> An alternative conceptualization of the size of change from Jones and Baumgartner (2005) defines changes as small or large relative to the entire distribution of changes in a given year.

Congress. They find that “the ‘normal’ theory of moderation that is posited by incremental theories is more myth than reality” (LeLoup and Moreland 1978, 239). Similarly, Natchez and Bupp’s (1973) work on the Atomic Energy Commission finds that stable patterns at the agency level mask variation at the program level.

While many scholars have suggested that lower levels of aggregation should be used, and some scholars have examined specific agencies or departments at multiple levels, no previous work has systematically examined the entire federal budget at multiple levels of aggregation. This paper uses a unique dataset to take on this task. By looking at levels of aggregation ranging from the subaccount to the subfunction to the agency and up to the appropriations bill level, this paper explores the characterization of the budget as incremental and whether findings by previous scholars on specific agencies are generalizable to the budget as a whole.

### *Data*

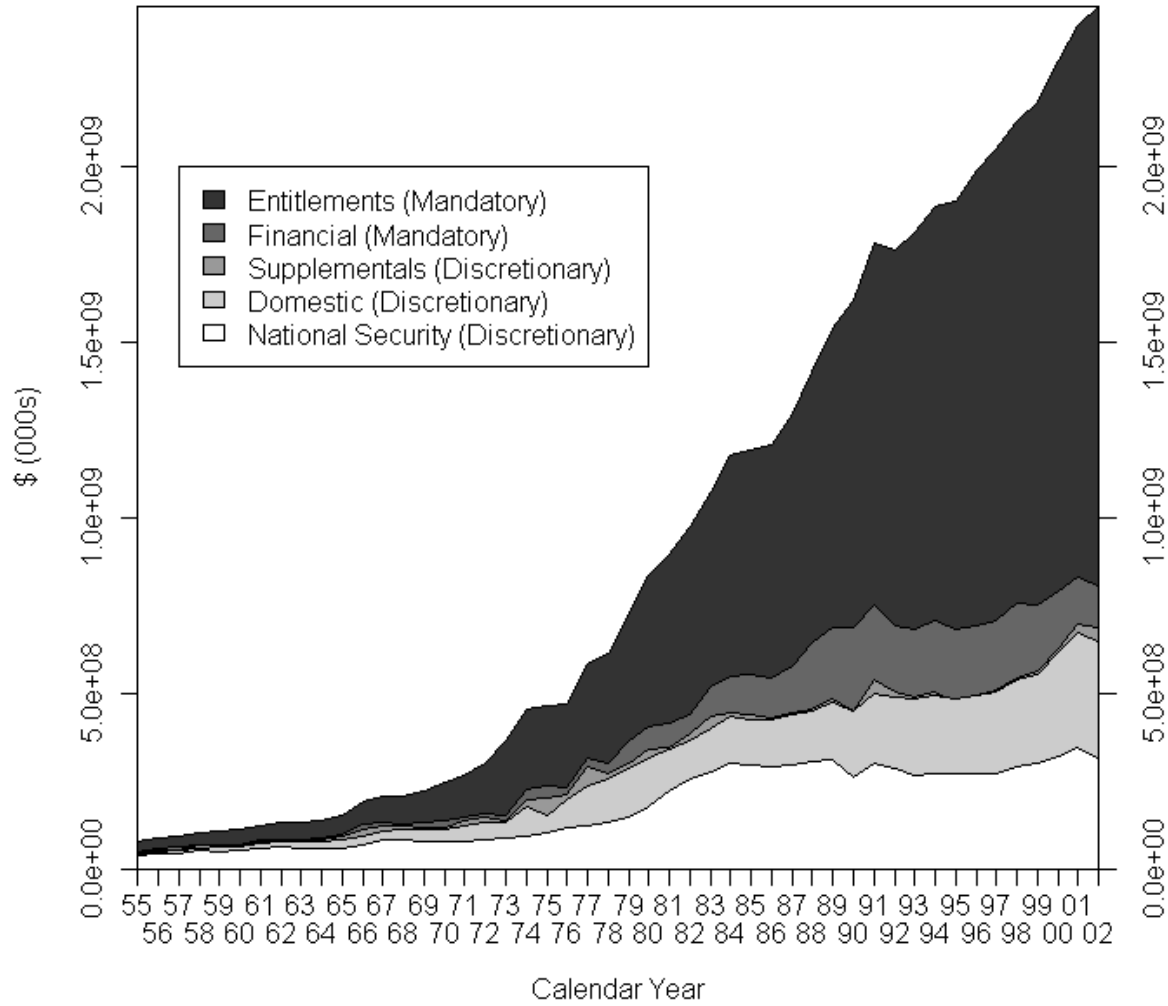
In order to assess the incrementalism of the budget at different levels of aggregation and using different thresholds for small change, this paper uses a new dataset of appropriations from 1955-2002 that reconstructs the U.S. federal budget to make budget categories comparable across time (Cogan 2002). This dataset provides the most disaggregated budget data possible, allowing change to be measured at the subaccount level. For each fiscal year between 1955 and 2002, this dataset records the budget authority (appropriations) assigned to a given subaccount. For example, within the National Forest System program account are subaccounts including Assistance to the States for Tree Planting, Cooperative Range Improvements, and International

Forestry. Each subaccount has identifiers as to subfunction<sup>3</sup>, agency, and appropriations bill, allowing us to observe patterns at different levels of aggregation. Figure 1 shows how the budget has changed over time. The budget is composed of discretionary spending (that which is allocated in appropriations legislation each year) and mandatory spending (that which is allocated based upon pre-determined formulas). As Figure 1 shows, mandatory spending, which is allocated outside the appropriations process, has been increasing over time and is composed mostly of financial spending (interest on the debt) and other mandatory spending (entitlements like Social Security and Medicare). In 2002, this mandatory spending constituted \$1.7 trillion and approximately 70% of total spending, up from 37% in 1955. Discretionary spending, decomposed here into national security, supplemental, and domestic spending, has also been increasing over time with national security spending taking an increasing share. Because it is the spending over which legislators exercise direct control and it is less tied to external foreign policy developments, we consider only domestic discretionary spending, which totals \$332 billion in 2002, and, unless otherwise noted, adjust the spending for inflation.

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<sup>3</sup> The coding of subaccounts (NSA) into subfunctions was done using True's (2007) historical account of budget subfunctions. Each subaccount within the budget database was matched to a subfunction coding according to the description in True (2007) and information in the budget database. Such a matching should not be considered perfect.

**Figure 1: Budget Breakdown (1955-2002)**



The dataset also corrects two limitations of previously available data.<sup>4</sup> First, it takes into account the timing of supplemental appropriations. Wlezien (1993; 1996) showed that appropriators systematically underappropriate in regular appropriations bill knowing that the

<sup>4</sup> See, for example, Kiewiet and McCubbins (1985), Kiewiet and Krehbiel (2001), Aldrich, Gomez and Merolla (2006) among many others.

President can then request more spending in the supplemental appropriations bill. For example, under the Balanced Budget and Emergency Deficit Control Act of 1985, emergency spending did not count toward the budget caps. Appropriators learned to place spending for such accounts as the Federal Emergency Management Agency disaster relief in supplemental rather than regular appropriations bills. This budgeting ploy has recently been much discussed, as President Barack Obama's FY2010 Budget includes an estimate of the cost of emergency spending, saying, "Breaking with past practice, the President's Budget puts more than \$20 billion annually (the statistical probability of the costs of dealing with these emergencies) in its budget projections" (2009).<sup>5</sup> Looking at Figure 2, we see that if the appropriators pushed emergency spending into the supplemental bills in the FY1999 budget and if analysis proceeds as it has in the past using only regular spending (as illustrated under A), we would attribute a low level of spending to the 1998 Congress. Accounting for the supplementals prevents attribution of low spending to a Congress that subsequently appropriates a large amount in a later supplemental appropriation bill, which can result in seriously flawed estimates of spending. Figure 3 shows supplemental spending as a proportion of domestic discretionary spending. In several years, supplemental spending has composed more than 40% of domestic discretionary spending and it averages 16% of domestic discretionary spending or \$9.6 billion per year.<sup>6</sup> It is thus crucial that measures of policy outputs include supplemental appropriations, which can only be done by using disaggregated data.<sup>7</sup>

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<sup>5</sup> This does not, of course, guarantee that emergency spending will be included in the regular appropriations bills, just that it is included in budget projections.

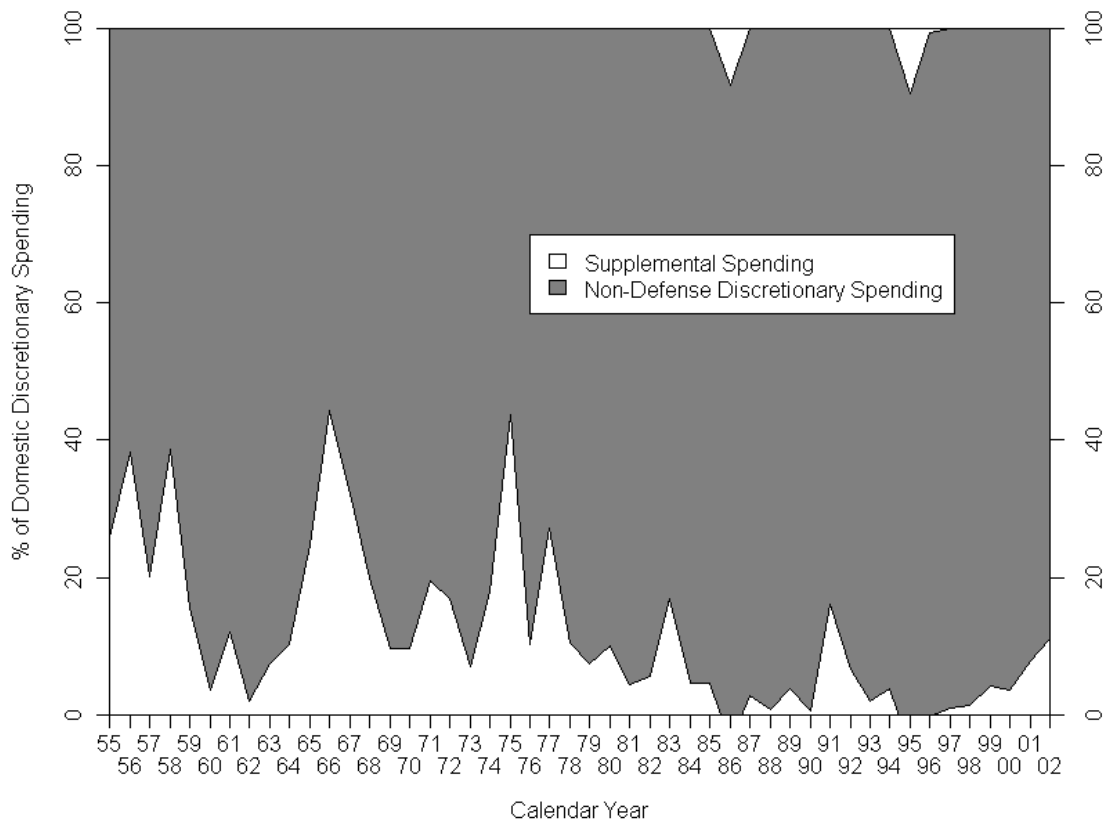
<sup>6</sup> In 1986, 1995, and 1996, supplemental spending is negative because the supplemental spending bills were composed mostly of rescissions of previously appropriated money.

<sup>7</sup> See Cogan, Muris, and Schick (1994) for a discussion of the importance of the study of microbudgeting.



Additionally, it would *not* attribute the FY1998 Supplemental spending to the 1998 Congress, which did vote on that spending. When using political variables that are only available on a calendar year basis, this dataset ensures that measurement of the location of policy matches up with the timing of the measurement of changes in the positions of the pivotal players. These two adjustments are critical when using the budget as a measure of policy but have generally been ignored by previous researchers.

**Figure 3: Supplemental Spending as a Percent of Domestic Discretionary Spending**



### *Size of Change*

Using this new dataset, we compare the degree of incrementalism in the federal budget under different restrictions on the size of small changes. Table 1 shows the percentage of changes in each category for data aggregated by subaccount, subfunction, agency, and appropriations bill. Positive and negative changes are treated symmetrically. For example, the 0-1% category encompasses changes from -1% to +1%. If legislators simply adjusted each agency or subfunction for inflation, we would expect most of the changes to be in this category, since these data are already adjusted for inflation, but very few of the changes, approximately 5% to 8%, are this small.

A more permissive definition of small changes, changes less than 10%, which is commonly mentioned in the literature, includes approximately 50 percent of the changes. This leaves almost half of the changes in the 'big' category; just over half of the subfunctions and nearly half of the agencies change by more than 10%. Even more surprising, approximately 6% of the agencies and subfunctions have their spending doubled or reduced to zero. This data suggests that incrementalism, at least in its most basic form of a predominance of small changes, is not a good description of the federal budget. Such a large degree of change contradicts both the outcomes and the process definition of incrementalism, at least to the extent that they can be measured by the proportion of small changes. Clearly, these are large changes in outcome (dollars). But these findings also suggest a process that considers large (greater than 10%) changes for nearly one in every two agencies, hardly a limited set of policy alternatives. These

findings are robust to alternative specifications of the base, including using current dollar spending<sup>8</sup> and taking into account the creation of new subaccounts.<sup>9</sup>

**Table 1: Percentage of inflation-adjusted changes in domestic discretionary spending in each category: Calendar Year 1955 to 2002 (unless otherwise noted)**

	0 – 1 %	1.1 – 5 %	5.1 – 10 %	0 – 10 %	10.1 – 20 %	20.1 – 30 %	30.1 – 40 %	40.1 – 50 %	50.1 – 100 %	101 + %	Median % Change	Total # of Obs.
<b>Subaccount</b>	6.2	25.0	16.0	47.2	15.0	6.8	4.3	3.1	13.8	9.8	11.2	17468
<b>Subfunction</b>	6.5	23.2	18.7	48.4	20.2	7.2	5.8	4.3	7.3	6.7	10.4	1799
<b>Agency</b>	8.2	25.7	19.6	53.5	17.0	7.9	5.7	3.0	7.3	5.5	9.2	1011
<b>Appropriation Bill</b>	4.9	18.8	17.3	41.0	17.0	7.1	4.8	3.6	10.4	16.0	14.7	606
<b>1955-1979, by Subaccount</b>	5.2	18.0	16.0	39.2	16.3	7.8	4.7	3.3	15.4	13.3	16.0	6440
<b>1980-2002, by Subaccount</b>	6.7	29.1	16.1	51.9	14.2	6.3	4.1	3.0	12.8	7.7	9.3	11028

### *Level of Aggregation*

We next examine how incrementalism varies at different levels of aggregation, considering first spending aggregated by agency (following Dempster and Wildavsky 1979) and

<sup>8</sup> An argument might be made that we are biasing our findings against incrementalism by using inflation adjusted (or constant dollar) amounts in our percentage changes. Perhaps one cause of incrementalism is a preponderance of small changes that result from adjusting spending for changes in inflation. However, using current dollar amounts in our analysis yields results even more inconsistent with predictions from the incrementalism model. Although there does appear to be an increase in incrementalism over time, consistent with the works of Jones et al. (1997), the 1960s and early 1970s have a few cases where the proportion of changes less than 10 percent is less than the proportion of changes greater than 100 percent, an outcome clearly not consistent with incrementalism.

<sup>9</sup> In general, the incremental model focuses on the changes that result from the continuation and elaboration of existing policies, but does not deal well with changes that occur from a shift in policies (Crecine 1967), especially if these shifts involve the creation of new programs. Up until this point, our analysis has ignored the creation of accounts. Each yearly entry for a subaccount is 'NA' until creation and therefore, the percentage change for the first year of creation is undefined and omitted. Adjusting for the inception of accounts by making spending in a subaccount the year before inception equal to \$1000 (a minimal amount) allows us to account for the creation of accounts in our analysis. The creation of an account is clearly a non-incremental action. It is both the creation of a new category of spending (a policy change) and an increase in spending. As a result of the omission of the inception of programs, the prior results have actually been biased toward finding incrementalism. Not surprisingly, by accounting for the inception of programs we find even less support for incrementalism.

by subfunction (following Jones, True, and Baumgartner 1997). These data are quite aggregated; there are 30 agencies and 46 subfunctions, compared to 1,539 subaccounts.<sup>10</sup> Looking at the first four rows of Table 1, the agency level exhibits the lowest median percentage change (9.2%). It also has the highest percentage of changes in the 0-10% category, with more than half of all changes. Thus, the agency level of aggregation is most reflective of incrementalism.<sup>11</sup>

On the other hand, there is less evidence of incrementalism at the disaggregated level, where nearly 10 percent of subaccounts are doubled or zeroed out. The median size of a change at the subaccount level (11.2%) is greater than the median size of the change at the agency and subfunction levels. Strikingly, over 13% of changes by subaccount fall in the 50-100% range compared with 7% using higher levels of aggregation. Major changes in spending at the subaccount level can be masked when the changes are added up to yield spending by agency or subfunction. For instance, if the components of an agency face one large budgetary cut and one large budgetary increase, looking at the agency level will suggest roughly no change in the agency's budget, even if there were significant changes in the distribution of spending. Thus, the more aggregated numbers do not capture tradeoffs among subaccounts within the agency or subfunction.

Finally, the most aggregated level, the appropriations bill, is least well characterized by incrementalism.<sup>12</sup> Over 60 percent of the year-to-year changes are greater than 10% and 16

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<sup>10</sup> The differences in number of total observations are not as great as this indicates, since the lower levels of aggregation entail more missing data. At the subaccount level, nothing is appropriated to almost 75% of the subaccount-years. This is because the subaccounts are much more detailed and thus come into and out of being more frequently. The total numbers of observations are included in the final column of Table 1.

<sup>11</sup> The subfunction level, which we don't consider in depth here, resembles the agency level.

<sup>12</sup> Omnibus spending bills pose something of a dilemma here. Empirically, in years with omnibus bills, we calculate the spending for each bill as though it had passed separately by summing spending on the subaccounts that make up each bill. This allows for consistent comparison across time, at the cost of treating omnibus bills as though they are

percent of the changes are greater than 100%. Additionally, the median change, nearly 15%, is higher than at any other level of aggregation. In sum, when budgetary data is assessed at the two most appropriate levels of aggregation in terms of congressional decision making – the subaccount and the appropriations bill – we find the least evidence for incrementalism, as defined by small year-to-year changes. This highlights a theoretically important distinction between congressional and bureaucratic decision-making and suggests that the underlying models of choice should take more seriously the contrasting roles of the two branches. In the remainder of this paper we focus on the congressional decisions, but we encourage other researchers to take seriously the aggregation decision when investigating bureaucratic decisions.

This overall assessment of budgetary change may mask changes in the level of incrementalism over time. For instance, Jones et al. (1997, 1321) find that the budget has become increasingly incremental over the post-World War II period. To assess this claim, the last two rows of Table 1 split the data, aggregated by subaccount, at the midpoint of the time period. There are more large changes in the early period and more small changes in the later period, suggesting that incrementalism has been increasing over this time period. But even the later time period fails to provide strong evidence of incrementalism, since nearly half of the changes are greater than 10% and over twenty percent of the changes are greater than 50 percent.

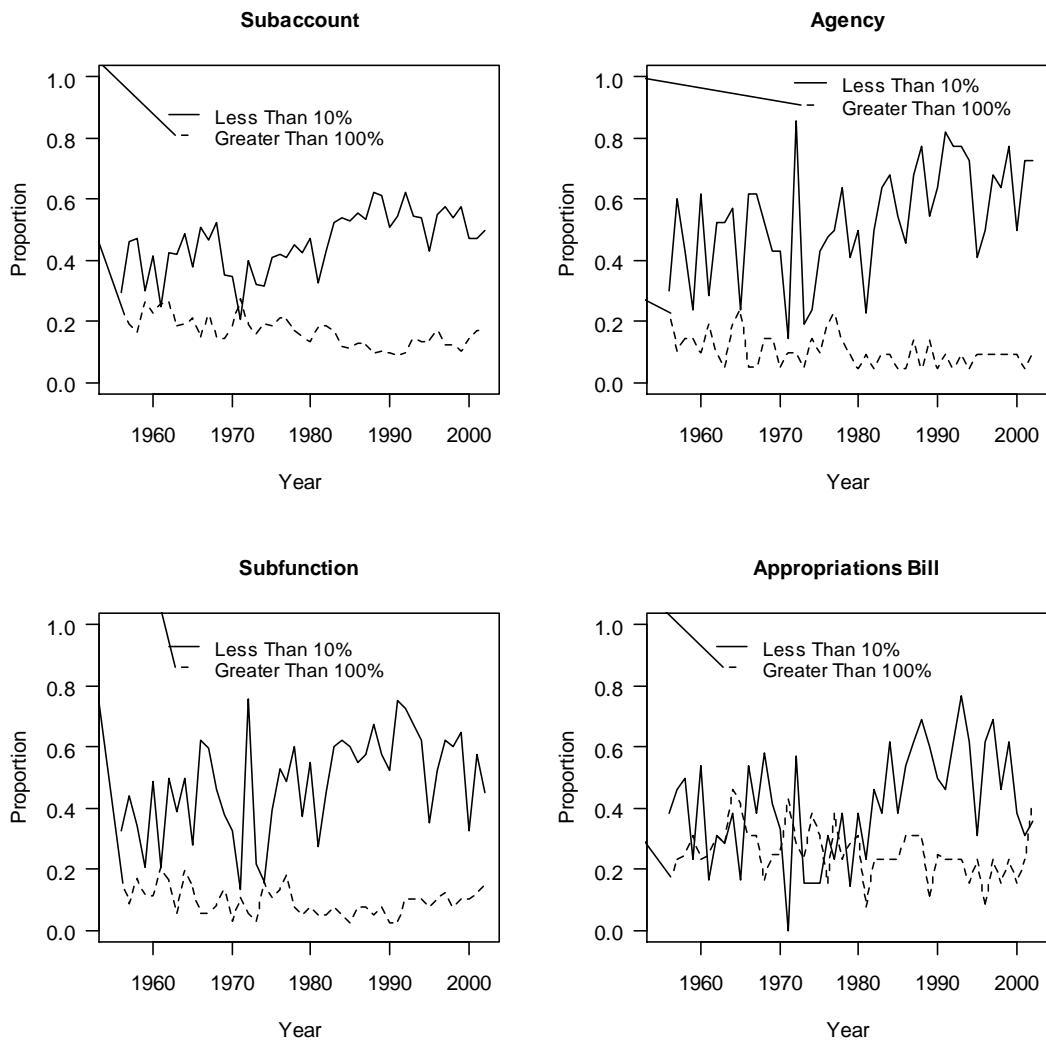
Figure 4 further illustrates both the trend toward more incremental decisions and the differences between the levels of aggregation, showing the proportion of changes that are less than 10 percent as well as the proportion of changes that are greater than 100 percent. While all

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the same as passing each bill separately. For the purposes of this study, we consider consistency over time to be more important than the question of how omnibus bills differ. However, others have provided excellent studies of how legislators' strategies may differ on omnibus legislation (Krutz 2001), political maneuvering on particular omnibus bills (Nelson 1953), and the logrolling logic behind omnibus legislation (Shepsle and Weingast 1981; Shepsle and Weingast 1987).

four series exhibit more small changes later in the time series, analysis at the subfunction and agency levels shows a greater degree of incrementalism. In contrast, when data is aggregated by appropriations bill there is little evidence of incrementalism prior to 1980, and even after 1980 approximately twenty percent of changes are greater than 100%. In the early part of the time series the proportion of changes less than 10% and greater than 100% are nearly equivalent.

**Figure 4: Distribution of Budgetary Changes by Level of Aggregation, CY 1955-2002**



### *Politics and the Level of Aggregation*

Returning to the careful matching of level of aggregation with assumptions about the level of decision-making, we provide two illustrations of how choosing the appropriate level of aggregation for model testing is important and has substantive impacts on the policy conclusions that researchers can draw. First, we assess the relationship between change in party control and incrementalism. Then we turn to the relationship between divided government and incrementalism. Though these political factors are obviously related, we distinguish between change in party control and the existence of divided government. For both, we make predictions about the level of aggregation at which we should observe the relationship and assess whether the data are supportive of these predictions.

Our understanding of policy formation hinges on understanding how different levels of aggregation, or different stages in the policy process, convey differing strategies or priorities. As noted at the outset of this paper, there is a trade-off between stability and responsiveness of government policy that may be evident in the level of incrementalism. This tradeoff is highlighted in recent debates about the government response to the current recession and bank bailouts. Treasury Secretary Tim Geithner said, "If our policy response is tentative and incrementalist, if we do not demonstrate by our actions a clear and consistent commitment to do what is necessary to solve the problem, then we risk greater damage to living standards, to the economy's productive potential and to the fabric of our financial system" (Schoen 2009). Whereas an incremental response provides policy stability, a non-incremental response may be necessary to show effective government responsiveness to such developments as the recent financial crisis. In general, we expect incrementalism in policy formation when this year's

problems are similar to last year's and relying on precedent is thus defensible and rational (Crecine 1967, 789). However, when this year's problems are different, either because of changes in external conditions, as is the case in the current economic crisis, or because there are changes in the priorities of policy makers due to changes in party control, incrementalism is unlikely to be a satisfactory description of policy formation. In budgetary policy-making, we should expect changes in party control to manifest at the appropriations committee level, where change in congressional party control brings with it changes in the committee composition and chair. When the party of the President switches, his budget proposal may reflect similar volatility.<sup>13</sup> As Berry (1990) notes, the appropriate level of aggregation depends on the assumptions being made. Since the subcommittees handle the most disaggregated decision-making, the allocation of funding to subaccounts is the most appropriate level of aggregation at which to test hypotheses about the effects of change in party control. When there is a change in party control, we should expect a less incremental response at the disaggregated level than when party remains the same. On the other hand, the party change variable should not manifest in changes in the volatility of appropriations at the bill level because allocations of spending to the bills is determined by budget resolution procedures, where a simple change in party control should have less impact.

We use the intersextile range (the difference between the size of the change at the 83<sup>rd</sup> and 17<sup>th</sup> percentiles per Jones et al. (1997)) as a measure of volatility to show that the level of

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<sup>13</sup> Exclusion of the presidency of a form of change in party control (that is, looking only at changes in party control within the House or the Senate) produces results similar to those found in Table 2, except that only the subaccount level of aggregation reaches statistical significance.

aggregation at which the analysis is conducted matters when studying the budget.<sup>14</sup> The advantage of this measure is that it is not highly affected by outliers like the mean or standard deviation is (Mandelbrot 1963). When we regress the intersextile range of budgetary outcomes on time and an indicator for a change in party control (of either the House, the Senate, or the Presidency), the coefficient on change in party control is positive, indicating that changes in party control are associated with more budget volatility. Just as expected, the effect is only significant ( $p < 0.1$ ) at the lowest levels of aggregation (see Table 2). Although the change in party control is significant at the two lowest levels of aggregation - the subaccount and the subfunction – the amount of variance explained by time and changes in party control is greater at the lowest level of aggregation, as evidenced by the adjusted R-squared value dropping from 0.50 to 0.28 when moving from the subaccount to the subfunction level. At higher levels of aggregation – either agency or appropriations bill – change in party control does not come close to achieving statistical significance. This suggests that when the policy priorities of those in government change, there is a large amount of reshuffling in spending decisions. There is not, however, a significant change in the overall volatility of the budget, which is largely constrained by macro-level political and economic variables.

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<sup>14</sup> There are some problems with this as a measure of incrementalism, but its use makes our analysis comparable to prior results. The use of the measure in this way, however, presupposes the existence of incrementalism. That is, if you assume that the budget is made up primarily of very small changes, a large intersextile range does indicate an increase in the number of large changes. A small intersextile range, however, does not imply that there is little volatility in the budget because if all accounts/agencies/subfunctions changed by 100%, then the intersextile range would be zero. Furthermore, one could argue that if greater disagreement over policy leads to more volatility in spending, that this should hold across all accounts/agencies/subfunctions and therefore the intersextile range should be small. A more accurate description of what the intersextile range measures is whether the distribution of changes is equal across accounts.

**Table 2: Effect of Changes in Party Control on Incrementalism (Log of Intersextile Range, 1955-2002)**

	Subaccount	Subaccount with Inception	Subfunction	Agency	Appropriation
<i>Intercept</i>	4.69*** (0.104)	4.93*** (0.111)	3.83*** (0.11)	4.04*** (0.16)	4.78*** (0.219)
<i>Time Trend</i>	-0.0253*** (0.00367)	-0.0246*** (0.00392)	-0.0165*** (0.00387)	-0.0288*** (0.00567)	-0.026*** (0.00772)
<i>Change in Party Control</i>	0.267** (0.132)	0.275* (0.142)	0.278* (0.14)	0.292 (0.204)	0.14 (0.279)
<i>N</i>	47	47	47	47	47
<i>R<sup>2</sup></i>	0.526	0.479	0.314	0.375	0.206
<i>Adjusted R<sup>2</sup></i>	0.504	0.455	0.283	0.347	0.169

Standard errors in parentheses.

\*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

On the other hand, divided government has long been held as a potentially important factor for understanding macro-level policy formation. This system-level variable should manifest in changes at the more aggregated level. That is, differences in the relevant players and their strategies at the different levels of aggregation mean that the presence of divided government should only have an effect where members of Congress are decision makers and where the parties can exert coherent strategies, the appropriations bill level. Many scholars have noted that the presence of divided government may exacerbate inefficiency in government, produce legislative gridlock, and, at the extreme, government shutdowns (Binder 2003; Brady 1993; Sundquist 1992). Most research on the effects of divided government has focused, as it should, on aggregate patterns of legislative gridlock. For instance, David Mayhew (1991) finds that the presence of divided government relative to unified government does not significantly affect the number of landmark pieces of legislation coming out of Congress. Fewer scholars have looked for effects of divided government at more disaggregated levels of policy formation. One such study which does explore disaggregated aspects of policy-making is that of Jones,

True, and Baumgartner (1997). They utilize budgetary subfunctions and find that the dissensus associated with divided government produces increased budget volatility. This relationship between divided government and volatility is in marked contrast to much of the divided government literature that associates divided government with gridlock, incrementalism, or a reversion to the previous year's budget (Alt and Lowry 2000; LeLoup 1975; Wildavsky 1992). Following this literature, we hypothesize that divided government is associated with decreased volatility (incrementalism) at higher levels of aggregation.

To assess whether the relationship between divided government and volatility is contingent on the level of aggregation, we replicate the style of analysis in Jones et al. (1997), focusing on each of the possible levels of aggregation. Regressing the log of the intersextile range on time and an indicator for divided government indicates that the level of aggregation is both substantively and statistically important (see Table 3). We find that both the direction of the point estimate and its significance depend on the level of aggregation that is used. Just as expected for a system level variable, at the subaccount level of aggregation, divided government is not a significant predictor of the intersextile range. When we adjust for the inception of subaccounts (as discussed above) or use the subfunction level of aggregation, the point estimate remains positive but insignificant. When the agency is chosen as the level of aggregation, the direction of the point estimate changes, although it remains statistically indistinguishable from zero. However, when we aggregate by appropriations bill, divided government has a negative and statistically significant effect ( $p < 0.1$ ). The substantive conclusion from these results is that the presence of divided government reduces overall budget volatility, consistent with the traditional gridlock argument.

**Table 3: Effect of Divided Government on Incrementalism (Log of Intersextile Range, 1955-2002)**

	Subaccount	Subaccount with Inception	Subfunction	Agency	Appropriation
<i>Intercept</i>	4.7*** (0.12)	4.92*** (0.128)	3.82*** (0.126)	4.06*** (0.182)	4.97*** (0.235)
<i>Time Trend</i>	-0.0247*** (0.00398)	-0.0241*** (0.00425)	-0.0162*** (0.00419)	-0.0277*** (0.00603)	-0.0213*** (0.00779)
<i>Divided Government</i>	0.0372 (0.118)	0.0528 (0.126)	0.0777 (0.124)	-0.00301 (0.179)	-0.406* (0.231)
<i>N</i>	47	47	47	47	47
<i>R<sup>2</sup></i>	0.483	0.437	0.259	0.346	0.254
<i>Adjusted R<sup>2</sup></i>	0.46	0.411	0.225	0.316	0.22

Standard errors in parentheses.

\*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Thus, we find that changes in party control have a significant effect on budget volatility only at disaggregated levels of analysis, while the presence of divided government has a significant effect on budget volatility only at a more aggregated level of analysis. These findings indicate the extreme importance of theorizing and testing models at the appropriate level of aggregation. No longer is there any excuse to look for the effects of variables that are expected to act at the level of drafting a bill at a more aggregated level. Nor should we test for the effects of macro-level political variables with disaggregated data. One of the most appealing traits of budget data is its availability at different levels of aggregation and scholars should take advantage of this.

### *Conclusions*

Data limitations have, in the past, precluded analysis at the disaggregated level. But with this new dataset available, decisions about aggregation should be informed by a theoretical motivation, clarifying whether we should expect decisions to be made at the subaccount, agency, or bill level. To advance the study of public budgeting, formal theory should help specify the

conditions under which to expect incrementalism and volatility. This formal modeling should be clear about the level at which decisions are made to facilitate the appropriate choice of aggregation for model testing using the budget. As in the analyses above, decisions about the level of aggregation provide potentially important insights about policy-making that go beyond mere differences in methodological specifications to provide a snapshot of Congressional policy formation. This formal theory should also focus on how and under what conditions changes in political context matter. It should "try to link changing environmental conditions, budget processes, and budget outcomes" (Rubin 1990). For example, if decentralization occurred after the Congressional and budgeting reforms of the mid-1970s and this drives the change in budgeting (Schick 1980), we might expect macro-level political variables such as a divided government to have a reduced role in budgeting decisions. This paper has focused primarily on congressional policymaking, but we challenge others to consider how bureaucratic models may be tested using budgetary data. In his work on agencies within the Department of Agriculture, Moreland (1975, 45) notes that the agency's managerial capacity, size, and the experience of its staff can all affect budgetary allocations. These data aggregated at the agency level provide a unique chance to expand this work to the entire budget.

Our summary of incrementalism using different definitions of small changes casts doubt on whether incrementalism is an apt characterization of the budget at the subaccount and appropriations bill levels of aggregation. We show that incrementalism has increased over time, but that still more than 20 percent of subaccounts are characterized by a change of more than 50%. This does not necessarily mean that incrementalism is not a good description of the budgetary process, but it does indicate that incrementalism in the form of a high proportion of

small changes is not a good description of budgetary outcomes. This year's spending may very well be a function of last year's spending, but this analysis shows that the changes are surprisingly large. Returning to the substantive policy implications of understanding incrementalism in the federal budget, there is little stability in year-to-year budgeting, especially at the subaccount and appropriations bill levels.

We find that the level of aggregation matters not only for assessing whether incrementalism aptly characterizes budgetary changes but also for what conclusions can be drawn about the influence of political change on the budget. We show that divided government results in reduced budgetary volatility at higher levels of aggregation, as theory would predict, but not at disaggregated levels where change in party control is associated with increased volatility. This is consistent with the levels at which decisions are made. Change in party control can have a big impact on the subcommittee that makes subaccount level decisions, whereas divided government affects aggregate level budget negotiations. Thus, changes in the party in power can result in significant instability of budgetary outcomes at the disaggregated level. But interparty conflict results in gridlock at aggregated levels.

It is tempting to conclude that agency budgets are relatively stable, and perhaps even protected by the common occurrence of divided government that leads to gridlock, but underlying this stability is major volatility at the subaccount level. And this volatility is, at least in part, driven by changes in party control, which occur often. This reflects the fundamental tradeoff between the stability critical to governance during times of political change and governmental responsiveness, in particular of elected officials to the interests of their constituencies.

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