Priority Based Budgeting: An Honest Broker among Municipal Departments?

ABSTRACT

Implemented in over 200 North American local governments, priority-based budgeting (PBB) reflects a contemporary attempt to systematically determine and implement desired budgetary reallocation within government. Proponents of PBB claim that this budgetary approach is highly effective in prioritizing governmental programs and aligning budgetary allocation to those priorities. However, core municipal functions such as public safety and public works have proven to be impervious to past budgetary shocks (Jordan 2003). Can PBB overcome the budgetary inelasticity of core functions to better align budgetary allocations with organizational priorities? This study examines 32 early municipal implementers of PBB with difference-in-differences analysis, finding that PBB has a differential effect upon various types of municipal departments; casting doubt on its ability to fully reallocate budgetary resources from low- to high-priority programs.

INTRODUCTION

After decades of arduous budgetary battles, it may come as a surprise to today's observer that American local government budgeting was once a relatively simple and non-controversial accounting task. However, taxpayer revolts and calls for smaller government coinciding with increasing service demands and personnel costs have triggered nearly perpetual budgetary deficits for a large share of these local governments. As this new fiscal reality became entrenched, municipal departments were confronted with the loss of an incremental budgeting approach where all parties gain and instead encountered a zero-sum process that forced funding trade-offs—creating departmental winners and losers.

Against this backdrop, priority-based budgeting (PBB) represents the latest budgetary reform striving to reject the vestiges of incrementalism and instead leverage these trade-offs to better align organizational resources with policy priorities. Since the Great Recession, PBB has soared in popularity—now implemented in over 200 North American local governments and deemed a best practice by influential municipal professional associations. Proponents of PBB claim that this budgetary approach is highly effective in prioritizing governmental programs and aligning budgetary allocation to those priorities. However, core municipal functions such as public safety and public works have proven to be impervious to past budgetary shocks (Jordan 2003). If PBB is to be as effective as advertised, the approach will need to effectively counter the following question: *Can PBB overcome the budgetary inelasticity of core functions to better align budgetary allocations with organizational priorities?*

This study marks the initial scholarly attempt to address this research question by examining the departmental budgetary allocations of 32 early municipal implementers of PBB. Using a difference-in-differences approach, the analysis compares budgetary allocations of

departments containing a relatively large proportion of low-priority programs versus those that include a greater share of priority programs, both before and after PBB implementation. The findings indicate that core functions such as public safety and public works are largely unaffected by the PBB process, instead driven by external factors such as community population and income variation over time. However, PBB appears to be highly effective in other, more discretionary, departments such as administration, planning and development, and quality of life. Collectively, these results provide initial evidence that PBB has a differential effect upon various types of municipal departments—casting doubt on its ability to fully reallocate budgetary resources from low- to high-priority programs.

PRIORITY BASED BUDGETING

PBB owes its name to an accounting firm, as Coopers and Lybrand repackaged ZBB concepts under the PBB label in 1984 (Midwinter 1984). Offered primarily in the UK, local governments implemented PBB as part of an effort to trim organizations and to be more data-driven (Worrall and Bill 1997). More recently, the Great Recession of 2008-2009 reinvigorated interest in rational budget reform ideas such as ZBB and PBB, especially in the United States (Kavanagh 2012). As in the UK, US local governments have taken the lead on implementing PBB. The Center for Priority-Based Budgeting (CPBB) (rebranded recently as ResourceX) has been the primary driver, working with 30 local governments to implement PBB by 2010, 70 by 2014, and now it boasts "over 200 cities, counties, school districts, special districts, and nonprofit organizations in the US and Canada" as partners (Hall et al. 2017; ResourceX 2021, n.p.). As Hall et al. (2017, p. 11) frame it, PBB is an extension of ZBB that is "by local government for local government."

What does PBB offer for these local governments? As Kavanagh et al. (2011) explain, PBB in theory requires that a local government first identify available resources, in contrast to an incremental, expenditure-driven budgetary process. Departments and divisions also work to identify their service-delivery programs and the associated cost of each. In addition, the budgetary decision-makers (who can be staff, elected officials, community members, or a combination of these groups) identify community priorities for the upcoming fiscal year. The final preliminary step is to score the programs in terms of their level of alignment with one or more community goals. Once scoring is complete, available dollars are allocated to programs in order of priority score until funds are exhausted. In theory, the remaining low-priority programs would go unfunded and be considered for elimination.

Proponents of PBB cite many advantages to implementing this budgetary approach. Although PBB (in both the UK and the United States) was implemented initially as a response to poor economic conditions and scarcer public resources, it is now considered a strategic alternative to incrementalism (Lynch et al. 2017) that is more than a budget reduction tool; it is an approach to resource allocation that maximizes desired results by linking strategic planning with budgeting (Kavanagh et al. 2011; Worrall and Bill 1997). PBB can help to promote service-delivery innovation as programs identify new approaches to align themselves entrepreneurially with community priorities (Hall et al. 2017). PBB also provides a platform for governments to pursue outcomes-based budgeting, performance management, customer service improvements, and public participation (Mitchell 2014; Hall et al. 2017).

In addition, PBB can increase government transparency and community engagement, as its most robust form requires wider public participation in the budgeting process (Lynch et al. 2017; Mitchell 2014; Worrall and Bill 1997). Since PBB incorporates community members at

the beginning of the budgeting process in establishing values and goals, Godwin (2021) categorizes the budgeting approach as "involving citizens" in an updated version of Arnstein's ladder of public participation, beyond the "inform" and "consult" categories that are associated with the traditional budgeting process. For these reasons, PBB has been recognized by the International City/County Management Association as a leading practice and as a best practice by the Government Finance Officers Association and National League of Cities (Alliance for Innovation 2021; National Association for County Community and Economic Development 2017).

As PBB has spread across local government, some drawbacks to the approach have been noted. PBB is very difficult to administer as it requires a substantial amount of information and analysis to divide existing departments and divisions into service-delivery programs and to calculate the full cost of each (Lynch et al. 2017). Due to this, the principal PBB implementation challenge is the time and resources necessary to initiate and sustain the process (Hall et al. 2017). PBB also requires an effective strategic process so that short-term priorities are aligned with long-term goals before any reallocation effort takes place (Worrall and Bill 1997). Therefore, PBB requires the support of both senior executives and elected officials (Kavanagh et al. 2011). Beyond capacity, PBB can be "potentially destabilizing and expansionary—Pandora's box" (Worrall and Bill 1997, p. 15).

BUDGETARY TRADE-OFFS IN LOCAL GOVERNMENT

The budget process is the dominant resource allocation exercise performed by a government on an annual or biennial basis (Mitchell and Thurmaier 2016; Hall et al. 2017). Traditionally, US governments have budgeted incrementally by spreading revenue growth across the existing funding allocations they grant to their respective agencies (Wildavsky 1964).

Incrementalism thrives during periods of stable revenue growth, which translates to steady expenditure growth across all organizational units (Kavanagh et al. 2011). The incremental approach can be characterized as "safe, non-expansionary, manageable, and understandable" (Worrall and Bill 1997, 15). Incrementalism also provides the best explanation for prevalent political and transactional budgetary behavior such as horse trading, back scratching, logrolling, pork barrels, etc. (Rauch 2016). No matter how much budgeting is programmed, planned, and data-driven, it will be to some degree fuzzy, and therefore incremental (Worrall et al. 1998).

However, incrementalism has received intense scrutiny in the past four decades; seen as ill-suited for a time of resource scarcity, growing complexity, strategic planning, and executive-driven public organizations. US government revenues have flattened since the taxpayer revolts of the 1970s while costs have accelerated, often eliminating the increment available for dispersal among a government's agencies (Kavanagh et al. 2011). Without an increment that allows all to benefit, the budgeting process has evolved into a conflictual one that produces winners and losers—creating tension for which the transactional politics of incrementalism are ill suited (Worrall and Bill 1997). By perpetuating status quo resource allocation, incrementalism also impedes strategic thinking, innovation, and partnerships, which are all highly valued contemporary public management approaches. In addition, scholars critique incrementalism for lacking transparency and citizen engagement due to its emphasis on political dealings between elected officials and bureaucrats, reducing trust in government and politicians (Mitchell 2014).

To fill this void, public budgeting began to focus on establishing policy priorities instead of distributing the increment. The policy function of budgeting recognizes that public resources are scarce: no longer does everyone win in the budgetary process, and agency base budgets are fair game for budgetary cuts. Thus, budgetary actors became policy actors, concerning

themselves with priorities, analysis, reallocation, and group conflict (Gosling 1987; Lee 1991; Thurmaier and Willoughby 2001). Indeed, "prioritization" was the dominant trend during this difficult budgetary terrain of the 1970s and 1980s, when the policy function of budgeting was entrenched (Rubin 1996, 112). Ultimately, the budget document has become the one of the best articulations of a society's priorities, and therefore its policy (Hall et al. 2017; Bailey and Fishbein 2015).

A shift away from incrementalism by local governments means that departmental base budgets are no longer immune from budgetary cuts. However, based on the limited existing scholarly literature, allocation patterns do appear to vary by department type. Jordan (2003) examines whether local government budgetary allocation can be explained punctuated equilibrium theory, finding that some departments are more prone to punctuations. Specifically, she finds that *allocational* departments—defined by Peterson (1981) as expenditures that benefit all members of a jurisdiction instead of a targeted segment—such as public safety and sanitation experience a more stable flow of budgetary allocation over time, while non-allocational departments (parks, highways, public buildings) experience more punctuations in that flow. Sapotichne et al. (2013) extend this research by applying an urban policy perspective, again concluding that expenditures for allocational departments are more stable than redistributive and developmental departments. However, they classify public works and general government as allocational; while health/welfare, community/economic development, and recreation/culture are not. Finally, Kaczynski and Crompton (2006) find that local government departmental expenditures were largely stable between 1989-2003 regardless of service area, attributing this to the dominance of incremental budgeting. These contradictory findings, regarding both the

stability and contingency of local governmental departmental expenditures, warrant further exploration.

HYPOTHESIS

H: Following implementation of priority-based budgeting within a local government, budgetary reallocations from low- to higher-priority programs occur at a comparable level across all its departments.

DATA AND VARIABLES

Sampling and Data Collection

Evaluating the efficacy of public management innovation—especially reform of a significant organizational institution such as the budgetary process—requires a delicate balance of patience and persistence, as one must allow time for implementation to take hold but also be opportunistic to track down sources of data as they emerge. Such is the case with PBB in US municipalities, where 1) no publicly available data exist regarding the prioritization outcomes within these cities, and 2) the retrospective nature of its evaluation cannot include governments that have recently implemented PBB.

To overcome these challenges, CPBB fulfilled the authors' request to provide departmental prioritization data for a number of its initial municipal clients. As part of the implementation process, CPBB assisted each organization with a prioritization process that divided service-delivery programs into four quartiles of relative priority. These program prioritization data serve as the key research variable in this study as they allow one to analyze whether budgetary reallocations are flowing away over time from the lowest-priority programs into higher priorities.

The study sample does not include all 200-plus CPBB clients because the study design requires that at least three years have passed since PBB implementation to gauge reallocation

outcomes appropriately. Thus, the sample is limited to CPBB clients who completed

implementation prior to 2017. In addition, only cities (not counties or special districts) are

included to maximize consistency across the sampled units. Consequently, 32 cities that were

among the earliest adopters of PBB comprise the study sample. Some cities completed

implementation as early as 2009. Collectively, these 32 cities host 361 departments.

Panel data for the study were collected from a number of sources, reducing the possibility

of common source bias. As mentioned, for each of the 32 cities CPBB provided a listing of

service programs and their respective priority quartile-ranks (1, 2, 3, 4). Budgetary allocation

data were gathered from the cities' annual (or biennial) budget documents for the three years

prior to PBB implementation and three years afterwards. Data for organizational fiscal variables

(annual total revenue and intergovernmental revenue) were amassed from cities' comprehensive

annual financial reports. The study includes several additional control variables: 1) election data

for the political variable were gathered from the Associated Press via web searches, 2)

population and income data came from the US Census Bureau via its online repository, and 3)

age data were collected from the National Center for Health Statistics bridged-race population

estimates available via the US Centers for Disease Control and Prevention website. Data for the

control variables were collected from 2008 to 2019, if available.

Operationalizing the Variables

Theories of budgetary reallocation often drive resource decision-making within local

governments, but this occurs within the bounds established by fiscal and community

characteristics. Maser (1985, 1998) establishes that external political, economic, and

socioeconomic attributes often spur local government action. McDonald (2015) utilizes the fiscal

policy space literature to add governmental behavior to this list of determinants in his model of

county fiscal health. Since a substantial amount of theory and empirical evidence suggests that

fiscal health is a primary determinant regarding municipal budgetary reallocation (Levine 1978;

Scorsone and Plerhoples 2010), the model utilized in this study explains departmental annual

budgetary change with not only political, economic, and socioeconomic variables as its controls,

but also fiscal ones. PBB implementation serves as the government behavior under study,

moderated by the research variable of departmental priority score. The next two sections describe

the operationalization of the dependent and research variables, while Table I lists the specific

control variables along with the measurement and operationalization strategies.

Table I. Operationalization of Control Variables

Variable	Measurement Strategy	Coding
Total Revenue (fiscal)	Total revenues as listed in the Changes in Net Position schedule found in the city's comprehensive annual financial report.	Ratio scale, in 2008 dollars
Intergovernmental Revenue (fiscal)	Percentage of capital outlay of total revenue as listed in the Changes in Net Position schedule found in the city's comprehensive annual financial report.	Ratio scale, in percentage points (0-100)
Population (socioeconomic)	Total population for city, as listed by the US Census Bureau in its American Community Survey.	Ratio scale, in number of people
Democratic Vote (political)	The percentage of total vote received by the Democratic candidate. The county presidential vote is utilized for 2008, 2012, and 2016 values. The county senatorial vote is utilized where present in 2010, 2014, and 2018; the gubernatorial vote is utilized otherwise. In 4 of 192 instances, a house district race was utilized when the county fell completely within the district and no statewide election occurred. 2009, 2011, 2013, 2015, and 2017 were interpolated.	Ratio scale, in percentage points (0-100)
Household Income (economic)	Median household income for city, as listed by the US Census Bureau in its American Community Survey.	Ratio scale, in dollars
Age (socioeconomic)	Mean community age, as calculated from the Bridged-Race Population Estimates conducted by the Centers for Disease Control and Prevention (2018 vintage).	Ratio scale, in years

Prosperity Change Score (Dependent Variable). While study of budgetary allocation may focus on the raw amount of dollars received or how organizational funding is proportioned, any examination of reallocation must concern itself with budgetary change over time (Jones and Baumgartner 2005; Flink 2017). Reallocation implies a shift of a unit's resources among its subunits; since the study examines cities, one must determine the appropriate subunit to evaluate. At first glance, the program level appears most appropriate, as it is prioritized through PBB and the prioritization data are reported by program. However, further examination of the municipal budget documents indicates that program reporting either is not provided or does not match the program structure utilized for PBB prioritization, limiting the use of reallocation measures such as Ho's (2011) program proportional variation measures. Due to these inherent limitations within the data, this study utilizes the department as its unit of analysis, aggregating program data.

Since study of budgetary reallocation occurs longitudinally, the subunit activities for which the allocation is made should remain essentially constant over the study period to afford an "apples-to-apples" comparison from one year to the next. Thus, the budget whose change is under evaluation requires definition. When evaluating governmental service-delivery programs, the operating budget serves the most appropriate allocative comparison as it mirrors organizational structure and is comparable year-to-year as it typically represents funding for the same set of activities (Bland and Nunn 1992). For this study, the budgetary allocation is defined as the sum of departmental appropriated allocations for personnel, contracting, and supplies (thus excluding capital, debt service, and transfer allocations).

Finally, from a departmental perspective, reallocation implies a changing proportion of organizational dollars flowing in and out of the unit. One may be tempted to simply utilize raw or percentage departmental funding changes from one year to the next, but this assumes the

overall "pot" of available funding remains constant over time—ignoring the reality of overall organizational revenues and expenditures fluctuating from year-to-year, as well as annual spending decisions regarding capital and debt service. Therefore, a measure of budgetary reallocation should view the departmental allocation as a proportion of the organizational budget; and by extension, a measure of reallocation should report how departmental budgetary proportions vary over time (Flink 2014).

Developed as an initial challenge to incrementalism's idea of consensual bargaining among agencies, Natchez and Bupp's (1973) *prosperity change score (PCS)* is "a measure of how the budgetary allocations to programs change over time relative to changes in other programs" (Meyers 1996, 9). PCS therefore assesses a component unit's relative success (or failure) in an intra-organizational competition for budgetary resources (Gist 1982; Berry 1990). Due to its micro-level unit of analysis, PCS is able to detect budgetary reallocation often masked by apparent organizational fiscal stability over time (Flink 2014); as evidenced in earlier studies of the US Atomic Energy Commission (Natchez and Bupp 1973), US military research and design programs (Gist 1982), and UK county boroughs (Danziger 1976). Ryu (2013) more recently utilized PCS to demonstrate that performance-based budgeting in the US Department of Commerce had not significantly altered budgetary allocations. Although use of PCS has been criticized in terms of its ability to discredit incrementalism, PCS is viewed as a legitimate tool to demonstrate trade-offs between component units when budgetary trade-offs are anticipated (Gist, 1982), such as PBB activities.

As Ryu (2013) illustrates, PCS is calculated for a particular agency by first determining the agency's proportion of organizational budget for a fiscal year (e.g., \$50m/\$200m=0.25) and then dividing it into the agency's mean budgetary proportion over a series of fiscal years—

producing a ratio that indicates the relative difference of an agency's particular budgetary allocation versus a typical year for that agency. In doing so, PCS standardizes budgetary allocation over time, allowing for comparison across agencies and fiscal years (Flink 2014). In this study, the departmental budgetary allocation is divided into the organizational operating budget for each of the six fiscal years sampled to produce annual proportions, the results of which are then each divided into the mean of these six proportions to determine the PCS value for each department in each sampled fiscal year. All PCS values are finally multiplied by 100 for ease of reference.

   Departmental Priority Score (Research Variable). Although program priority can be measured in many different ways, CPBB first utilizes PBB to identify desired organizational outcomes and then asks citizens, elected officials, and/or staff to score the programs in terms of alignment with these designated outcomes. Thus, in its purest form, the CPBB system represents a participatory version of "budgeting for outcomes", "outcomes-based budgeting", and "price of government", which are all innovative budgetary approaches that reject line-item incremental budgeting in favor of reallocating resources in bulk toward high-priority programs (Barnett and Atteberry 2007; Osborne and Hutchinson 2004).

   Since the study utilizes the city department as the unit of analysis, the program-level priority data required transformation into a department-level measurement. CPBB also performs program-level budgeting with its clients, and therefore able to provide a cost estimate for each program, which could then be aggregated to determine an overall departmental cost estimate along with a subtotal of estimated costs for all departmental programs listed as fourth-quartile (lowest) priorities. The fourth-quartile subtotal is then divided by the departmental total to calculate the percentage of departmental costs associated with fourth-quartile programs, creating

a continuous variable to represent a relative level of priority for a department and its service-delivery programs.

RESEARCH DESIGN AND ANALYSIS

Methodological Approaches

Identification of the appropriate methodological design to test this hypothesis presents a formidable challenge. PBB implementation in this sample does not happen uniformly during the same period of time in the panel of analysis, nor does the period when departmental priority is determined. Furthermore, the departmental priority measure is a snapshot in time; reflecting the relative priority of that department immediately prior to the implementation of PBB. Cumulatively, the appropriate method therefore needs to accommodate a panel of data over time, implementation occurring at different points in time, and the static nature of the departmental priority score.

Difference in Differences (DiD) Analysis

A DiD approach offers a solution to address these inherent data challenges. DiD serves as a form of quasi-experimental analysis, comparing two groups over time when one has received a treatment and the other has not (Card and Krueger 1994). The analysis assumes and identifies a difference between the two groups prior to the treatment, then tests whether a significant "difference in differences" occurs post-treatment. Thus, it is well-suited for the present study as the research question asks whether the difference in budgetary allocations between low- and high-priority departments is substantially altered by PBB implementation—i.e, does PBB reallocate resources from low- to high-priority departments after its implementation? The DiD approach also allows for the inclusion of additional control variables into the model so that exogenous forces are stripped away, allowing for a true comparison between the groups.

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The standard DiD model is adapted for this study as fixed effects are observed in the data. First, the adapted model accounts for organizational fixed effects since each local government contains multiple departments that are included in the sample, helping to control for the effects of organizational attributes. Second, the Year for each observation is included as an independent variable in the model to account for budgetary trends that occur generally across the nation year-to-year.

The study analyzes five DiD models based on department type. Following the design of Jordan (2003) and Sapotichne et al. (2013), initially six types were identified: three of which were allocative (Public Safety, Public Works, Administration) and three non-allocative (Development, Parks and Recreation, and Health and Welfare). However, the study dataset did not include a sufficient number of Health and Welfare for robust analysis. Thus, this category was combined with Parks and Recreation to create the Quality of Life category since both groups of departments are considered non-allocational and should exhibit similar budgetary behavior (Sapotichne et al. 2013).

Parallel Trends Assumption

One of the main assumptions underlying DiD estimation is the parallel trends assumption; that in the absence of the treatment, the average outcome of the treatment and control groups follow parallel trends over time (Abadie 2005). While this assumption does allow for the averages of the time-invariant variables to differ between the treatment and control group, this assumption does not allow for the magnitude of the effects to change over time. The parallel trends assumption is vital to DiD analysis at it establishes the counterfactual by which the treatment group is compared (O'Neill *et al*. 2016; Rambachan and Roth 2019).

In the present study, testing for violations of the parallel trends assumption was done by analyzing the regression coefficient for the low-priority departments prior to PBB implementation. Where statistically significant, this indicates a violation of the parallel trends assumption since it represents a significant difference in the slope of its regression line when compared to high-priority departments prior to PBB implementation, which serves as the reference group in this analysis. In Table 3, the low-priority/pre-implementation coefficient is significant in two of the five models (Administration, Quality of Life)—requiring an alternative approach in those cases.

O'Neill et al. (2016) explores three alternatives to traditional DiD analysis for scenarios when the parallel trends assumption does not hold: 1) a lagged dependent variable regression approach, 2) the synthetic control method, and 3) matching on past outcomes. They find using Monte Carlo simulation that while traditional DiD analysis does produce unbiased estimates when the parallel trend holds, the alternative approaches still provide minimally biased, but useful estimates of treatment effects when the parallel trends assumption is violated. Of three approaches tested, the lagged dependent variable regression approach provides the most efficient and least biased estimates. The lagged dependent variable allows for the approximation of the unobserved component, in this case the causes of the violation of the parallel trends assumption, using a vector of pre-treatment outcomes. Therefore, given the violation of the parallel trends assumption within the present data, a lagged dependent variable approach is taken to obtain estimates of the average effect of treatment for these two models.

Findings

The descriptive statistics provide a glimpse of how PCS is altered by PBB implementation in these 32 cities. Overall, the mean PCS score is 99.99—to be expected as a department's PCS has a mathematical average of 100 across the years included in the calculation. However, the mean PCS value can vary when subsets of the data are analyzed. Indeed, the mean PCS value for low-priority departments prior to PBB implementation is 100.49, but it reduces to 99.21 following implementation, indicating that low-priority departments are losing their proportion of the organizational budget once PBB has been performed. Conversely, high-priority departments have a mean PCS value of 98.36 prior to PBB implementation and 101.93 thereafter. Collectively, these statistics indicate that the proportion of organizational budget allocated to low-priority departments shrunk after PBB implementation, while high-priority departments received a greater proportion. The range of PCS values from 42.47 to 171.27 also indicate sufficient variation within the sample.

The control variables paint a portrait of the local governments and communities included in the study sample. The average total annual revenues for these cities is just over $250 million, with a wide range spanning almost a trillion dollars. The portion of revenues from intergovernmental sources averages 17.83%, with a minimum value of 1% and maximum of 43%. The sample includes cities ranging from 10,567 to 494,324 in population, with an average of 122,827. Just over half of these cities' voters selected Democratic candidates, again with a wide range. The median income for these cities is $58,877 and the mean age is 38.15. Therefore, the average city in our sample is moderate politically, slightly older than the median age of U.S. cities in the 2010 Census (37.2 years old), and slightly poorer than the 2018 median household income in the U.S. of $64,324.

Table II. Descriptive Statistics

Variable	Mean	Std. Dev.	Min.	Max
Prosperity Change Score (overall)	99.99	9.64	42.47	171.27
Pre Impl. – Low Priority	100.49	9.54	72.01	149.57
Pre Impl. – High Priority	98.36	9.25	42.47	142.38
Post Impl. – Low Priority	99.21	8.68	64.60	142.29
Post Impl. – High Priority	101.93	10.69	70.37	171.27
Revenue (dollars)	$ 251,698,813	$ 246,363,562	$ 15,198,237	$ 980,541,000
Intergovernmental Revenue %	17.83%	9.34%	1.00%	43.10%
Population	122,827	114,218	10,567	494,324
Democratic Vote %	50.40%	13.27%	18.50%	75.5%
Median Income	$58,877	$21,131	$31,893	$137,188
Age	38.15	2.36	33.34	47.00
Year	2014.92	2.59	2008	2020

Table III. Difference in Difference Regression Output – By Department Type

	Allocative						Non-Allocative			
	Public Safety		Public Works		Administration^		Planning and Dev.		Quality of Life^	
Variable	Coeff	S.E.	Coeff	S.E.	Coeff	S.E.	Coeff	S.E.	Coeff	S.E.
Low Priority Dept * Post PBB Impl	0.16	(1.35)	1.12	(1.81)	**-5.92*****	(1.35)	-3.85	(3.24)	**-6.23*****	(2.67)
High Priority Dept * Post PBB Impl	-0.04	(1.47)	0.00	(1.87)	1.08	(1.47)	2.56	(3.40)	3.88	(2.94)
Low Priority Dept * Pre PBB Impl	-0.11	(1.20)	1.57	(1.68)	**4.41*****	(1.20)	1.55	(3.18)	**6.96*****	(2.33)
Total Revenue (dollars in billions)	15.55	(16.31)	18.26	(19.32)	**-72.85*****	(16.31)	14.87	(38.71)	23.29	(32.39)
Intergovernmental Revenue (%)	-9.48	(10.53)	-2.29	(14.04)	**48.08****	(10.53)	**36.39***	(22.08)	32.05	(24.50)
Population (in 1,000s)	**-0.30***	(0.17)	**0.49****	(0.23)	0.08	(0.17)	**-1.16*****	(0.39)	**-1.09*****	(0.41)
Democratic Vote (%)	**17.61***	(9.11)	-1.22	(12.73)	-11.23	(9.11)	20.41	(23.64)	-3.02	(21.23)
Median Income (dollars in 1,000s)	**-0.39*****	(0.13)	**0.43****	(0.20)	-0.04	(0.13)	-0.08	(0.32)	-0.17	(0.38)
Age (in years)	**7.98*****	(2.57)	-4.14	(3.62)	-1.42	(2.57)	5.46	(8.26)	12.62	(7.83)
Year	**-1.21***	(0.69)	-0.66	(0.89)	**2.13***	(0.69)	0.40	(1.93)	-2.68	(1.85)
F	**2.52*****		1.40		**4.67*****		**2.09****		**2.85*****	
n	445		281		583		203		197	

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

^denotes lagged dependent variable

All models account for organizational fixed effects

Table III reports the results of the five departmental DiD estimations. For *public safety* departments, PBB implementation does not have a statistically significant effect on the difference of budgetary allocations between those deemed lower or higher priorities. All three of the DiD coefficients are insignificant, range from -0.04 to 0.16. Since PCS is a ratio scale centered around 100, the PCS value can be roughly translated a percentage deviation of a particular departmental allocation when compared to an average calculated over time. Therefore, these coefficients all represent budgetary reallocation of less than one-sixth of one percent. However, a number of the control variables possess statistically significant relationships with the Public Safety PCS values—indicating that smaller, more Democratic, less affluent, and more senior communities are associated with proportionally larger public safety departmental budgets. The analysis also indicates that public safety departmental budgets were declining by 1.21% annually through the sampled period of 2008-2020. The overall model is also statistically significant, indicating that these demographic factors contribute to explaining the variance in public safety departmental budgetary change.

PBB implement does not seem to substantially affect *public works* departmental budgets within the sampled cities. Again, none of the DiD estimations exhibit statistical significance, but substantive change is bit greater than with public safety departments. Low-priority public works departments enjoy an average of 1.57% more in budgetary allocation than high-priority departments prior to PBB implementation; but that reduces to 1.12% afterward—indicating a marginal reallocative impact. The change in public works departmental budgets is better explained by population and income; budgetary allocations are proportionally higher for large and more affluent communities. Public Works budgets also declined during the study period, but at a lesser rate than public safety departments. The overall model is not statistically significant,

indicating that PBB implementation does little to explain variation in public works departmental budgetary allocations over time.

The PBB story is different, however, for *administration* departments; which exhibit strong evidence of budgetary reallocation in the sampled cities. The lagged PCS values for low-priority departments indicate a 4.41% annual budgetary increase prior to PBB implementation contrasted with a 5.92% decrease afterward; for a budgetary change of over 10%. In contrast, high-priority administrative departments see their lagged PCS values increase by 1.08%. However, PBB implementation is not the only driver of budgetary change for administrative departments; these departments receive a higher proportion of an organization's budget when revenues are lower (i.e., a smaller organization) and when intergovernmental revenue increases. Administrative budgets also trended upward at a significant rate of 2.13% over the study period. Due to these factors, the overall model explains a statistically significant portion of the variation in the administrative budgets.

The *planning and development* departments follow a similar, albeit statistically insignificant, pattern as the administrative departments. All of the DiD estimations do not exhibit significant relationships with PCS variation, but low-priority departments do increase prior to PBB implementation (1.55%) and decrease afterward (-3.85%); high-priority departments also increase following implementation, by 2.56% in this case. Planning and development departmental budget proportions also significantly increase as intergovernmental revenue does, but significantly decrease as population swells. These budgets increased over the study period, but not significantly so (0.40%). The overall model for planning and development departments significantly explains their budgetary variation, but at a weaker level than the public safety and administrative models.

The *quality-of-life* departments in this sample are most impacted by PBB implementation. They recieve the highest annual budgetary increases of all departmental types prior to reform (6.96%) but suffer a corresponding slash to their proportion of the organizational budget afterward (-6.23%), more than a 13% swing in budgetary proportion. Those deemed as higher priorities thrive in PBB though, enjoying an average annual budgetary increase of 3.88%. These values are likely higher in reality but artificially diminished by utilization of a lagged dependent variable. Beyond PBB, the organizational proportion dedicated to quality-of-life departments significantly declines as population increases. Overall, these departments see their collective budgetary share reduce by 2.68% annually during the study period. This quality-of-life model explains a significant portion of the budgetary variation for these departments, primarily due to PBB implementation.

The study findings should be tempered by its limitations. First, although the sample includes over 350 municipal departments, they hail from only 32 cities, severely limiting generalizability and analytic power. Second, the static nature of program quartile designation proved difficult to incorporate into time-series analysis, restricting analytical options that may have produced more robust findings. Third, the retrospective nature of evaluative research substantially reduced the number of cities available for study, again limiting generalizability and analytic power. Fourth, the limited nature of the years measured prior to and post implementation prevent the inclusion of more robust lags within analysis.

STUDY IMPLICATIONS

American local governments have turned to PBB to break free of incremental budgeting and embrace a nimbler budgetary system that adroitly aligns organizational resources with its priorities. In theory, such an approach levels the playing field for municipal service-delivery

programs—those deemed a high priority receives more funding while lower priorities receive less. This scenario would be a refreshing departure from budgetary politics and entrenched interests, but such an assumption has not been tested empirically. Can PBB truly create an unbiased, rational process where all organizational functions are impacted equitably? From a departmental perspective, it sure would be nice to know if PBB plays with a stacked deck before being dealt in.

The limited evidence from this exploratory study suggests that PBB does not live up to this claim. Core allocative functions the benefit the entire public such as public safety and public works appear to be immune from budgetary cuts to its low-priority programs. None of the DiD estimations achieved statistical significance, meaning that priority did not drive budgetary decision-making before or after PBB implementation. This also means that these governments did not invest in high-priority functions within these departments. Instead, it appears that budgeting for allocative departments is driven by political, economic, and socioeconomic aspects of their communities. If true, budgeting for public safety and public works may be best determined by community needs stemming from its population size along with its citizens' affluence, age, and politics (public safety only).

Conversely, PBB appears to deliver on its promise for non-allocative functions that have limited or targeted benefits among the public such as planning and development and quality of life programs. Not only do low-priority departments in this category experience substantial budgetary reductions (4-6%), the high-priority departments receive a greater proportion of the organizational budget (3-4%). While some of the budgetary change for these departments is driven by population change and intergovernmental revenue, the influence of PBB is striking

nonetheless. The quality-of-life departments (health, parks, recreation, safety net) serve as the best example of PBB reallocation.

The administrative departments are collectively a curious case as they are defined as an allocative function in the scholarly literature, based on the premise that administrative functions are required for an organization to function and benefit the entire public. However, the evidence from the sampled cities demonstrates that administrative departments are heavily impacted by PBB implementation, similar to the effect experienced by quality-of-life departments. This analysis should prompt reconsideration of how to appropriately classify administrative functions from a budgetary perspective.

Based on these results, one can safely conclude that PBB did not have same effect for all departments included in this sample. The allocative departmental budgets for public safety and public works were left largely unaffected by PBB implementation, while low-priority programs in the other departments saw 5-13% swings in their allocations. This budgetary behavior aligns with past studies (Jordan 2003; Sapotichne et al. 2013), casting doubt on PBB's ability to reallocate from low-priority programs to higher ones in allocative departments. Instead, the budgetary allocations for these core functions appear to be a function of exogenous factors that drive service demand.

From a theoretical perspective, these confounding results make it difficult to categorize PBB in terms of budget reform. At first glance, PBB appears to be quite effective in aligning dollars with organizational priorities for non-allocative departments as well as administrative functions, fulfilling the policy function of budgeting that forces budgetary trade-offs to pursue organizational priorities. However, the same is not true for the core allocative functions; these appear to better emulate the management and planning functions of the budgeting that rely on

performance, service demands, and trends to allocate organizational resources. At a broader level, though, PBB does seem to represent a substantial move away from incrementalism—either through its direct reallocations toward higher priorities or its allowance of core functions to be funded by demographic and economic trends. Neither of these outcomes mirror the autocorrelation and transactional politics typically associated with incrementalism.

For practitioners, the study reminds them to be realistic in their expectations as they consider PBB implementation. PBB does not appear to create a sweeping reallocation from lower-priority programs to higher ones and therefore requires a nuanced evaluation of its utility for a particular organization. PBB should be avoided by those seeking to reallocate dollars away from low-priority public safety/public works programs or invest in high-priority ones; instead local budgetary decisionmakers should rely on demographic and economic data to drive allocations within these departments. Conversely, PBB can be quite effective in reallocating dollars toward administrative, developmental, and quality-of-life priorities or away from programs in those departments that do not align with organizational priorities. Ultimately, city managers and finance directors must be sure to avoid perpetuating any illusion that PBB treats all departments the same, as the study's finding are quite clear that it does not.

The study limitations previously enumerated should temper the certainty of any conclusions offered in this paper. Additional research is necessary to confirm these findings and explore the causal mechanisms that produce them. In particular, future scholarly efforts should endeavor to: 1) expand the study sample to enhance the validity of the findings, 2) consider different departmental categorizations that may unearth more specific patterns of reallocations, 3) for allocative departments, examine the interplay of exogenous trends and PBB and how it

impacts prioritization efforts, and 4) consider alternative statistical methods to provide greater analytical validity and/or robustness for these initial conclusions.

Nonetheless, this study provides initially compelling evidence to believe that PBB has differential effects upon various municipal departments—counter to its central thesis that funds will be reallocated from low-priority programs to higher ones, regardless of department. Budgetary scholars, practitioners, and decisionmakers should all take pause before fully embracing PBB so that studies like this one and those to follow can tease out where PBB is most effective and where it is not. PBB continues to hold promise as a budgetary reform effort, but its utility appears to be more nuanced than initial claims would have one believe.

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