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Centralized Information Resource Management and Budget Periodicity

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ABSTRACT

This study explores the relationship between state-level centralized information resource management organizations and budget periodicity. The presence or absence of agencies that coordinate agency information technology activities is correlated against those that budget annually or biennially. Using a Chi-Square matrix, the expected vs. observed cells prove to be statistically significant. This implies that some degree of relationship exists and that the two variables are not independent.

INTRODUCTION

What factors influenced the creation of centralized information resource management (IRM) policy entities? Whether or not to centralize the processing of data has been a long standing debate (Perlman, 1965; Oldehoefst and Halstead, 1972; Statland, 1978; King, 1983; George and King, 1991). Yet, among exploratory variables, seldom has budget periodicity been posited among them. More specifically, most of the states budget annually and the remaining states budget biennially. This study explores a budget periodicity factor against the presence or absence of centralized information resource management.

The early use of computers was limited to practical tasks that had defined procedures, a fact increasingly recognized by users. These tasks usually included accounting and payroll functions where the large volumes of documents and the associated need for storage made automation appealing. Herbert Simon and others weighed the early merits within a book entitled *Centralization vs. Decentralization in Organizing the Controller's Department* (Simon et al., 1954) and since these organizations dealt with accounting procedures and unit record documents, they were closely tied to the practical need for record keeping. In his last edition of *Administrative Behavior*, Simon summarized the primary aspects of decision-making as they relate to accounting (1997), and administrative decisions often hinge on the results provided by modern practices in information technology.

Information Resource Management

What are centralized and coordinated IRM entities? From the 1989 study, the dominant organizational units were found to involve data processing operations, telecommunications, and policy and planning (Caudle, 1990). As a whole, these three functions collectively make up management categories that include organizing, planning, policy formulation, budgeting and accounting, personnel management and procurement. From that survey, data processing services were most likely to be under departments of Administrative Services or General Services (Caudle et al., 1989).

From the initial emphasis on data processing operations and services, focus was increasingly placed on telecommunications and policy issues. This was, in part, because data processing capabilities *could* diverge from existing infrastructures. Increasingly, users were able to connect to existing accounting and budgetary systems. From various locations, state IRM policy groups were expected to help with other pressing and fundamental automation problems. Still, the first and most likely place

to find a policy and planning entity for IRM is under the state comptroller, finance, budget or treasury departments, with the second most likely place being under the chief executive's office (Caudle et al., 1989). All but six of the 50 states have either a Chief Information Officer (CIO) or an IRM Commission (National Association of State Information Resource Executives, 1996) and other contemporary researchers have explored those implications (Lee and Perry, 2002). The need for the development of an effective information technology infrastructure is ever increasing (Kayworth, Chatterjee and Sambamurthy, 2001), but could this be influenced by a state's budget periodicity?

Budget Periodicity

In fundamental accounting, the periodicity assumption implies that the economic activities of an enterprise "... can be divided into artificial time periods" (Kieso and Weygandt, 1986:35). A budget is a document legitimized by law to cover a set interval of time. That interval is usually one or two years. Budget processes are stipulated by a set of rules and budget periodicity is among the most rudimentary of them (Kearns, 1993). To change periodicity related to a budget is to modification the budget's basic structure. Those who advise elected officials can help influence changes in budgeting, but it is up to decision makers to maintain its periodicity or change it (Hovey, 1995). The definition of budget periodicity as used by Paula Kearns "... refers to those states that either budget for a biennium, or draft two one-year budgets every other year" (1994:334). This is also the most common definition (Kearns, 1994).

A state's choice in budget periodicity can be influential to public policy and the scholarly treatment of it. Budgets make up a "regularly scheduled window" (Kingdon, 1984), and so this venue for public policy. In terms of legitimizing a plan it is an important step in governing, and changes in budget periodicity are large in magnitude. Multi-year budgeting is not just a projection of budget numbers "... but a corporate plan ..." (Rubin, 1990:182). But Larry Schroeder claimed that "... a single year is simply too short to encompass all financial impacts of current policy decisions ..." (1982). Any light shown on this core budget parameter might be welcomed and the development of centralized IRM may have had an influence.

An overview of this study is as follows. A brief background on the study of IRM as it pertains to budget periodicity is provided. Some discussion about the two variables is presented. This may suggest the presence of a relationship between the two factors. The next section describes the data and methodology. An interpretation of the results is provided as well as a conclusion.

Considering IRM and Budget Periodicity

Although a range of literature exists about Information Resource Management (IRM), a much more limited amount associates IRM with budgeting. Some have tried to help with the budgeting of data processing (Perry, 1985) while others have called for a better integration between accounting and budgeting systems (Wesberry, 1989). What is quite relevant to this study is what centralized IRM may have caused or enabled. Multivariate empirical studies on budget periodicity were

limited to just a couple (Kearns, 1993; 1994) and those did not consider the effects of planning, centralization or IRM. As a result, an exploration of the effect of IRM on budget periodicity may be appropriate. Could a state's budget periodicity be influenced by their organization of information technology?

Variability in IRM Centralization

The enveloping assumptions about the centralization of IRM are in transition. In the mid-1980s, a shift in IRM was observed from outright control toward more of a coordinating role (National Association for State Information Systems, 1987; 1988; 1989). By the time of a 1989 study, researchers reported that state IRM could not, and should not, be defined by a single model or approach. It was surmised that the states were responding to political directives, executive branch management style, existing resources, or the ability to adjust (Caudle et al., 1989). In mid-2002, California's legislation empowering certain centralized data processing functions effectively sunset (Government Technology, 2002).

Variability in Budget Periodicity

Over the last four decades, spurious variability has occurred with the intervals of budgeting. In 1940, forty-four states practiced biennial budgeting (Snell, 1995), and only four periodicity changes occurred in the 1960's (Kearns, 1993). Most of the changes in state periodicity occurred in the early 1970's. From 1970 to 1974 ten states shifted from biennial to annual and three states changed from annual to biennial. In 1971 alone, six changes were accrued with four states shifting from biennial to annual and two states changing from annual to biennial. The decade of the 1980's was somewhat of a fallow time for budget periodicity changes and it was not until the 1990's that additional states changed. More recently there are only 20 that budget biennially (Council of State Governments, 1996).

Preliminary Observations

The abruptness of periodicity changes in the 1970's suggests that some intervention occurred. According to the most knowledgeable scholar on the topic, Paula Kearns, the causes which influenced these cycles are not entirely conclusive. In one of her studies, a variable for the timing of legislative sessions might have overwhelmed her model. Further, she failed to use a variable to proxy planning. Allen Schick has posited three types of orientations: control, management, and planning (1966). It appears that whatever budget orientation, centralized IRM could be an integral part. However, up until this time, a planning variable it has not yet been operationalized.

EMPIRICAL ANALYSIS

The prior section provided a brief overview of budget periodicity as changes occurred from the 1960's to the present. But the emphasis suggests that the centralization of data processing functions could not occur until the 1960's. As described above, a flurry of periodicity changes occurred in the 1970's. But just because IRM, say X, and budget periodicity, say Y, vary together, and further that IRM (X) seemingly preceded the changes in state periodicity (Y), we cannot assume that X produced a change in Y (Blalock, 1961). It is quite possible that causality may occur, but a simple and preliminary examination of the current status of variables may substantiate a more detailed analysis. The null hypothesis is follows:

H01: States that have a Centralized IRM have no influence on their propensity to budget annually.

Another null hypothesis can be developed:

H02: States that budget annually have no influence on their propensity for Centralized IRM.

An operationalization of the variable arguments is as shown in Table 1.

Table 1.

Variable Name	Description
CIRPE	1 - state did have a centralized information resource policy entity 0 - state did not have a centralized information resource policy entity
PERIOD	1 - state budgeted annually

Variables

A centralized information resource policy entity (CIRPE) for each state is one variable of this analysis. The representation is dichotomous and was established for each state by the Council of State Governments (CSG) in 1996. A one (1) was recorded if a state had a centralized information resource policy entity (CIRPE) and a zero (0) was recorded for states that do not. A budget periodicity variable for each state is the other variable used in this analysis. The representation is dichotomous and was also established for each state by the CSG (1996). The periodicity (PERIOD) that a state uses for budgeting is represented as a dichotomous variable whereby a one (1) was recorded if a state budgets annually and a zero (0) was used for states that budget biennially.

Data Sources and Descriptions

Data for this part of the analysis were collected for each state for the most recent findings. The variable primary variable in question, CIRPE, was obtained from the Council of State Government's document entitled *The Book of the States*. The source for the Budget Periodicity was also assembled from that Council of State Government series (1996).

Methodology

In testing the preliminary hypothesis about the possible relationship between Centralized Information Resource Management entities (CIRM) and budget Periodicity (PERIOD), a Chi-Square matrix was used.

Results

The results, via the observed matrix, are shown in Table 2.

The expected frequencies are calculated by multiplying the total row by the total column and dividing by the sample size. In this instance the expected matrix is presented in Table 3.

The assumptions for the Chi-Square statistic are satisfied in that, first, all of the observations are independent, and second, all expected frequencies are greater than 5. The calculations are as shown in Table 4.

The degrees of freedom, with two rows and two columns is $(2 - 1)(2 - 1) = (1)(1)$ which equals one degree of freedom for the test of independence involving budget periodicity and centralized IRM. With a .05 level of significance the critical value Chi-Squared value in the upper tail value would be 3.84146.

Table 2.

	Biennial	Annual	
NOCIRM	2	12	= 14
CIRM	17	19	= 36
	—	—	—
	19	31	50

Table 3.

5.32	8.68	= 14
13.68	22.32	= 36
—	—	—
19	31	50

Table 4.

		Observed	Expected	Diff	Diff Sq.	Diff Sq. Divided by
						Expected
Biennial	NOCIRM	2	5.32	-3.32	11.02	2.0714
Biennial	CIRM	12	8.68	3.32	11.02	1.2695
Annual	NOCIRM	17	13.68	3.32	11.02	.80555
Annual	CIRM	19	22.32	-3.32	11.02	.49372
						4.64017

The rejection rule for the Null Hypothesis is as follows:

Reject H_0 if $X^2 > X^2$ at the significance level.

INTERPRETATION

With a critical value of 3.84146, compared with an observed level of 4.64017 the null hypotheses cannot be rejected, that is, that there is no influence between budget periodicity and the presence of a CIRPE. It appears that states that budget annually are more likely to have a centralized information resource policy entity (CIRPE). Conversely, states in which their budget periodicity is biennial are more likely not to have a CIRPE. Similarly, states that have a CIRPE may have a greater propensity to budget annually. In states in which a CIRPE is absent, their budget periodicity is more likely to be biennial.

CONCLUSION

By using a Chi-Square matrix, it can be surmised that the two variables that are not independent. This inquiry showed how some of the management practices associated with budgeting may be linked with the centralization of IRM. The above model has not been able to assess the overall strength or type of the association between the two variables. Thus, a more rigorous model may be appropriate in detecting the possible influence of centralized IRM on budget periodicity or the opposite.

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