

A Core/Periphery Structure in a Corporate Budgeting Process

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Many business organizations have adopted empowerment programs as a means of adapting to rapidly changing competitive environments. This paper examines the nature of ties among managers who participate in the budgeting process at a major apparel manufacturer. This case offers two primary contributions to social network analysis research. First, these data provide a concrete example of a context in which a core-periphery network structure can exist. Second, integrating the network data with ethnographic data to examine the structure of ties among managers is useful to help researchers to better understand the impact of corporate empowerment programs.

INTRODUCTION

In recent years, the academic and practitioner business literatures have documented and heralded the rise of the team-based, network-centered adaptive organization as a response to dynamic competitive market forces and emerging technology. Yet, limited research exists about the nature of managerial networks in firms in the current business environment. This paper examines the structure of ties among managers who participate in the budgeting process at a major apparel manufacturer.

Corporate budgeting presents a salient context to study managerial networks because it is a routine, widely-used, high-profile process that incorporates and impacts all organizational functions. Participatory or "bottom-up" budgeting is an example of a mechanism adopted by firms to promote employee empowerment and cross-functional interaction. Firms frequently adopt participatory budgeting programs to "empower" employees by allowing the workforce to set performance targets and allocate resources.

Consistent with these prevalent business practices, executives at our sample firm, to be referred to as Apparel Company (APCO), adopted a participatory budgeting process for fiscal year 1996-97. According to company executives, the primary goal of the process was to eliminate hierarchy and better integrate the network of managers. Unlike traditional "top-down" (hierarchical) budgeting, in a participatory budgeting process, the general managers should be most central and influential in the budgeting choices.

One common implementation difficulty that companies encounter is the ease in which the language of empowerment may be adopted, without substantively transferring control and

substantive influence to front-line management. In such cases, employees may be involved in the mechanical aspects of the process, but often feel as though their input was not substantively considered or incorporated into the final budget. Social network analysis enables us to examine the nature of ties amongst managers who participate in corporate budgeting. The structural data, when coupled with ethnographic data, can help to develop insight and understanding about corporate budgeting processes.

In this paper, social network analysis is used to examine two primary questions related to corporate budgeting at APCO. First, did the budgeting process work out as planned? Second, what type of structure emerged? The results are useful in helping researchers and practicing managers to understand the implications of adopting employee empowerment programs. The research site and data collection are discussed next.

THE RESEARCH SITE AND DATA COLLECTION

The Research Site

Data were collected from all 53 managers who participate in the budgeting process at APCO. APCO is a leading, brand-name designer and manufacturer of athletic performance and fashion clothing with annual sales of roughly \$500 million. The U.S.-based company out-sources production to the Far East and Latin America. Hence, APCO's budgeting process de-emphasizes capital budgeting (asset acquisition) and focuses on developing an operating expense budget to meet sales goals. The centralization of services and employees at one North American location allows for a one-period, parsimonious research design that incorporates all of the managers who participate in the annual budgeting process (for more detail, see Barsky, 1999).

In a historical context, this study was conducted in an important year for APCO's budgeting process. For fashion and apparel designers, success and market growth can occur rapidly and can quickly transform the organization from a "niche" manufacturer to a major, large-scale international enterprise. Such events unfolded at APCO in the late 1980s and early 1990s. For nearly twenty years, the company had existed as a limited scale entrepreneurial venture. After experiencing rapid growth in the late 1980s, the company issued an initial public stock offering in the early 1990s. These events radically changed the size and scope of APCO's operations. In an effort to match company capabilities with global market demands, the firm underwent a rapid period of "professionalization" of its workforce. These changes primarily consisted of the hiring of professional accountants, production planners and a corporate marketing team.

In an effort to stabilize and formalize processes, such as budgeting, the CEO (and company founder) invested in the financial education of functional managers. The goal was to develop an integrated workforce, where employees would readily share bases of functional knowledge to achieve corporate performance goals. Budgeting was seen as a "flagship" process which could be used to impart strategic and financial goals, facilitate cross-functional communication, and enable the appropriate allocation of resources.

The finance group was directed to "financially educate" functional managers over a period of years through an extensive year-round use of profitability reports. During the budgeting process (in the years prior to this study), financial managers aided the operational managers in the basic techniques of how to develop a budget. Company management believed that, by the year of this study, the functional managers had gained a satisfactory level of financial understanding and experience to independently develop operating budgets based on their business knowledge. The

financial managers were expected to act as coordinators and serve as a support function, as needed.

APCO's budgeting memorandum describes the process as "bottom-up" and one that should last about 2 ½ months. The memo encourages employees to, "Take Ownership. Be Proactive. This is your budget. You will develop it and ultimately be measured by it." The memo also specifically delineates each manager's responsibilities in the budgeting process. Clearly, the language in the memorandum and discussions with managers indicate that the budgeting process at APCO is intended to be bottom-up and participatory in nature. The design calls for a budget driven by the operating managers with executive oversight and final approval. In terms of the managerial network, one would expect general and front-line operating managers to be most central.

Data Collection

Data were collected in two primary phases. First, top managers were interviewed and documentation about the budgeting process was collected. These data were used to identify the managers who participate in the budgeting process and to refine the research questionnaire. Second, managers completed a research questionnaire that asked about demographics, rank, perceptions about budgeting process, and workplace contacts.

Network data were collected through "name-generator" type questions. Participants were asked to list the names of persons who (1) provide inputs or receive outputs of their routine work; (2) with whom they regularly talk about work-related activities; and (3) co-workers whom they consider to be friends or social associates. Wording of these questions in the questionnaire was intended to be as non-restrictive as possible, and consistent with instruments by Ibarra (1995).

**Table 1
Work and Friendship Ties Among Members of APCO**

		111111111122222222233333333334444444444
		5555
		123456789012345678901234567890123456789
		0123
	TECH_SERV	00000000000000000000010000101100000000000100000
1	ACCTG_MGR1	0011
	ACCTG_MGR2	0011100000011111011100101000111100110001001111001
2	BUDG_COORD1	1011
	PUB_REL	0101000000001001000101000001000100010000000110010
3	DISTRIB	0000
	SOURCING_OUTERWEA	0110011110100111101000001010100100011101000110101
4	R	0000
	VPFIELDSALEOPS	0100000101000000010010101000110110110001011001001
5	SR_SOURCING_PERFO	0011
	RM	000100000101000000000010000001100000000000000101
6	PROC_IMPR_ORDER_F	0000
	UL	0001000100000010000000101000010100010001000100011001
7	MIS1	1010
	CUSTSERV	0001101000111000011010101000110110111011000011001
8	CREDIT	0111
	ACCTG_MGR3	0001000000000010000000000100000000010000000000001
9	SOURCING_DEV	0000

1	ACCTG4	0000110000010000010000000011001100001000000011101
0	PURCHASING	0000
1	SRVPSALES	0001000100010000010110000010000100001010000111000
1	GMSPECEVENTSBU	0001
1	MIS2	0100010101101000010010001011110100010001000000010
2	VPINTLSBU	1000
1	ACCTG5	0110000100010100010000000000100100000000000111001
3	VPMARKETING	1010
1	SRMGRTEAMSERV	0101000000001001100000000010100000000100000110000
4	GMACTIVEOUTERSBU	0000
1	PRODMGR_PERF	0101001010000001010000001000001100000100000111001
5	MIS3	0010
1	DIRSBUOPS	0111000000000110000001001000000100010101000010001
6	BUDGETCOORD2	0000
1	GMOUTH	0001000000000100010000001000001100010011000011001
7	SRVPOPS	0011
1	CFO	0100100101111010101000100000100000001000000001001
8	DIRRETAILMARKET	1100
1	SRSOURCINGMGRACT-	0101000100000000010010000000100100000011000011001
9	WE	1000
2	MARKETMGRADS	011000000001000000000000000010000000001000000000110
0	GMPERFSBU	0000
2	MIS4	0000100100110000001000101000111100010001010011000
1	ACCTG6	1000
2	DIRSPECMARKETS	00100000000000010000000000000000000000000000000000
2	GMHEADSBU	0000
2	CREATIVESERVMGR	0100101100000000010010011000110110110010101111001
3	NATSALESMGR	1101
2	DIRMARKETSERV	1000010000000000000000000101000000100110011000010000
4	BUDGETCOORD3	0001
2	CONTROLLER	0101101100010011100010110011000001110001000010001
5	SRVPMARKETING	1100
2	PROJMGR	00000000100
6	DIRRETAILSTORES	0000
2	TREASURER	0001000001110100000100001000011100011001000010100
7	VPSALES	0011
2	VPHRM	00100000010100000000000001000000100010001000010001
8	COO	0011
2	CEO	1101100100011100011010100000000100110111001111001
9		0111
3		0100101100010000000010100010000111000011000100001
0		0110
3		1100010001000010100010000010000101001000000011001
1		0111
3		1111111101111011101010110011111000011011100111111
2		1111
3		0000100100000000000000000100000010000100000011001000
3		1000
3		0000000000000000000000000100001100000000000000000
4		0000
3		0100100100000000000000111000100010010000011011000
5		1000
3		0111101110010001100010111111100100100001010111001
6		1001
3		0001000101100000010100000010001100000000000111001
7		0000

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3          00010000000000111000001000000100000000000000010101
8          0000
3          00000001001000001010001100001101000000000000110000
9          1010
4          0101101100010001101010011011110100010000001111001
0          1111
4          0000000000000000000000100000000100000000001001000
1          0110
4          000010000000000000000010000000000010110000000000000
2          1000
4          0100100000000000000000100000100010100001100001010
3          0000
4          1111000000101110000000100000110100011011000011001
4          0000
4          0111001101101111101010111011101100111111000101001
5          1011
4          0100101101101010111010100000101110111001101110001
6          1111
4          0001010001000000000100000010000100000100000000001
7          0100
4          00100000000010000000100000000000100000000001000000
8          0000
4          0101111111001011111000101001111100011101000111100
9          1111
5          0100001000011000011010101000000110110011010011001
0          0000
5          0000000100000000010000101000111100000001100001101
1          0010
5          1100101100001010100000000011111100000011100011001
2          0101
5          1100100100100000100000110011101100010001000011001
3          0010

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Each participant's responses were coded as binary variables (i.e. presence of relationship) and entered into a name-by-name adjacency matrix. Since the research questions address group issues (rather than relationships between specific pairs), the matrix was symmetrized via the *maximum* method. This means that if either manager *i* mentioned manager *j* or the other way around, the tie between *i* and *j* was considered to be present. That is, x_{ij} and x_{ji} are both set to 1 if either $x_{ij} = 1$ or $x_{ji} = 1$. Symmetrization can be performed by UCINET 5 software (Borgatti *et al.*, 1999). The symmetrized dataset is given in Table 1.

Participants also provided perceptions of other managers' relative influence, using a seven-point Likert scale. Participants consolidated responses to the name-generator questions into one non-redundant list. The participants then rated the relative budgetary influence of each member of their personal workplace network. Also, after listing workplace contacts, participants then listed the most influential managers and rated those persons' influence.

As a validation check, participants also rated their own budgetary influence relative to others. The mean self-ratings of influence and influence ratings assigned by others were moderately correlated (.3869, $p < .01$). This result suggests that participants were in relatively fair agreement with others' overall assessment of their influence.

one or two members. Similarly, hierarchical clustering analysis of the clique overlap matrix reveals – for the most part – a single core group, as shown in Figure 2.

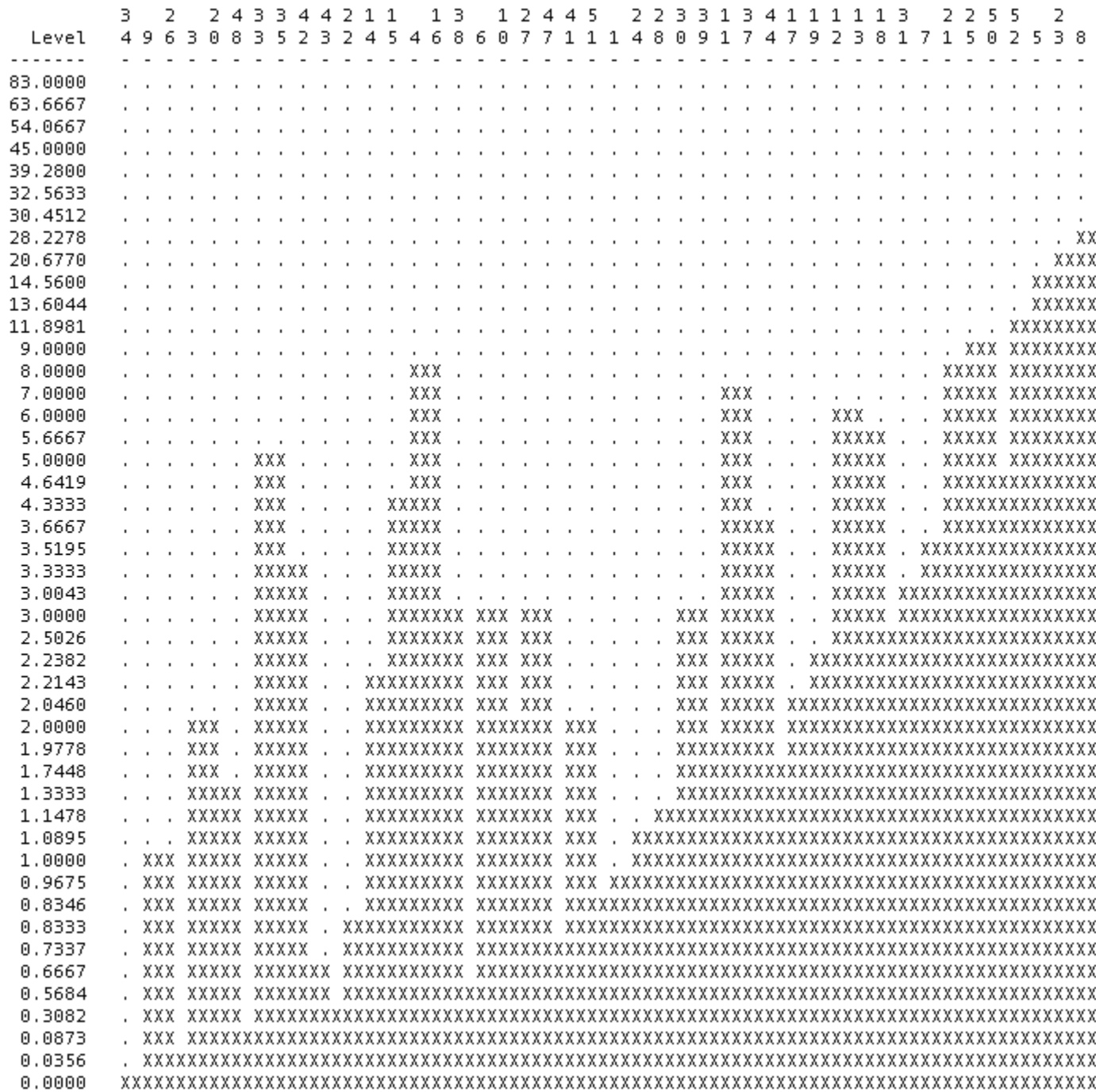


Figure 2. Hierarchical clustering (average method) of clique overlaps.

Borgatti and Everett (2000) suggest two additional ways to identify a C/P structure:

Two-class partition of nodes. By examining the group's adjacency matrix, researchers may simultaneously identify the core and periphery. The core is a dense, well-connected subgraph. Conversely, the peripheral nodes are loosely connected to each other, but connected to some members of the core. Essentially, such a model extends the well-known "Freeman star" to include a tight cluster of multiple group members at the center. Running the 2-class model in UCINET 5 for Windows (Borgatti *et al.*, 1999) yielded a fit (correlation criterion) of 0.390, which is moderately high.

Eigenvectors. This approach yields a continuous model in which each node is assigned some value of "coreness". Running the continuous C/P model in UCINET 5 yielded a fit (correlation criterion) of 0.533, which is quite high.

Members of the Core

Given the presence of the C/P structure, the next logical and interesting question is to consider why this type of structure exists at APCO. First, a review of data shows that rank was significantly correlated with coreness. A close examination of the network shows that the most "core" group consists of the three top financial managers – the Vice-president of finance (treasurer), the Chief Financial Officer (CFO), and the corporate controller. The next ring features the budget coordinators, the CFO and the COO. The non-financial managers, general managers, and a few vice-presidents are not in the inner rings.

The network structure appears to be quite similar to a topographical view of a traditional corporate hierarchy. In terms of the budgeting process, this network is quite revealing about the actual interactions among the players. However, the participative budgeting process was designed to invert the hierarchical pyramid. By definition, the espoused purpose of empowerment programs is to place front-line managers at the center of processes.

In this case, the finance function plays a highly central role in the network. The quantitative data indicated that coreness was highly correlated with rank and perceived budgetary influence. The budgeting process is designed to have operating managers play a significant role. The network graph suggests that coreness in the budgeting process is reserved for a set of individuals other than the operating managers.

DISCUSSION

This discussion will focus on why a core-periphery structure exists among the network of managers at APCO and how this structure can be used to help explain the outcomes of the budgeting process. Core-periphery structures can exist for two reasons. First, a core-periphery structure can arise simply as a function of indiscriminate ties and variation in degree. For example, in a pure commodity exchange market, a study of trader behavior is likely to reflect a core-periphery structure. That is, the variation in the degree of trading would cluster high volume traders and place relatively low volume traders along the periphery. Second, a core-periphery structure may reflect deliberate inclusion/exclusion of members based on a single attribute. The data suggest that this second case applies to the APCO managerial network.

Examples of attributes that may account for membership in the core include importance to the budgetary process, rank, (un)willingness to share (restrict access) to information and desire to maintain the corporate hierarchy. Integrating the structural data, interview data and responses to research questionnaires provides insights to explain the presence of this core-periphery structure.

This close clustering of the managers is consistent with interview responses which indicate that politics (i.e. isolated factions) are relatively non-existent at APCO. These managers also commented that high levels of communication across functions are common at APCO. Nonetheless, the interviewees suggested that senior management and top financial managers played the most significant role in the budgeting process.

Interviews with top managers at APCO indicate that asking employees to spend time on the budgeting process and not incorporating their input may have a detrimental effect on senior management's credibility. Many managers questioned whether the budgeting process at APCO was simply form over substance. This "pseudo-participation" undermined the credibility of the budget process and impaired employees' perceptions of top management. Many employees commented that a top-down process would actually be preferred over a process that asks employees to spend several working weeks on an activity that has little impact on outcomes.

For example, one of APCO's general managers commented:

"[APCO's budgeting process is] bottom-up until it reaches senior management. You work to achieve an end...[then, budgets] get handed in and get kicked right back to you saying [here's the number and the allocation]."

Another top manager remarked that managers believed in the process:

"We felt very good about the process from the bottom-up point of view. [Finance] gave people historical information as best [Finance] could ... we felt pretty good that [managers] spent the time pulling together their budget...

Instead, senior management...didn't get together...they didn't meet the deadlines. They were the ones who weren't getting together with their direct reports (SBU and cost center managers)...

And before you knew it, the budget that was put together on a detailed basis was gone...It was all thrown to the wayside...it fell apart...all of a sudden the budget just became some top-down high level number...the only thing that we had was some massaged number that [went] into the cost center reports.

[The] goal of the budget process was to make the budget be legit...how 'bout that? Actually, come to an agreement. That's where it fell apart when it went to a higher [management] level"

The manager commented that the events damaged the credibility of the process:

"So, months and months of work and respect for the budget process was lost. Until mid-October when it was down at the first line management level...It was a process we could all be proud of...and by the time it was finished, we didn't even want to talk about it.

We didn't care at that point. You should have never had us go through y'know 2-1/2 months of serious work putting together a budget if it didn't really mean anything to [top management] in the first place."

When asked about networks and communication, one top manager commented that the budgeting process initially helped functional managers better understand finance, and helped the financial managers better understand the business. However, the employees quickly realized the outcomes were directed and determined by senior management.

One manager summarized the events as follows:

"We all still talk bottom-up...you want bottom-up...y'know, but the reality in a lot of large companies, and being here at [APCO] is that senior management...create(s) an overall top number and allocate that to this [strategic business unit]."

These comments shed light on why the central core is so influential at APCO. In essence, a "rhetoric-reality" gap was present at APCO. That is, while management captured the language of empowerment, the reality (as reflected in the core-periphery structure) is an environment of a strong command and control based hierarchy.

These results are supported by the data from a secondary validation instrument – the Management Communications Diagnostic Questionnaire (see Jablonsky, et al., 1993) – that indicates that the financial function maintains a "command and control" orientation. That is, financial managers focus on supporting top management and reinforcing the corporate hierarchy. As reflected in the budgeting process, top management and the financial team were reluctant to give up control. Hence, the process that was designed to promote employee empowerment served to reinforce the corporate hierarchy.

CONCLUSIONS

This paper presents research that examines the structure of ties among managers at a major apparel manufacturer. The results have implications for the social networks and management literatures. First, these data provide an example of a core-periphery structure in a defined social context. Applying this model to other data sets may be useful in developing richer insights about why C/P structures can develop in social settings.

These results have several important implications for management practices and research. First, many companies use participatory budgeting to "empower" employees. The structural data provide a basis for managers to compare designs to outcomes. In this case, APCO spoke of having budgeting in the hands of operating managers. However, the results show that while many managers participated in the budgeting process, a few top ranking finance officers constituted the core.

More generally, the results are indicative of a "rhetoric-reality gap" that is prevalent in the financial management of many organizations (Jablonsky and Barsky, 1999). For example, while the budget memos tell employees that "this is your budget; take ownership," control at APCO still rests with top management. The employees with the highest influence ratings and coreness values were senior executives and financial managers in the core. Social network analysis was instrumental in identifying this result.

Superficially, APCO appears to have strong participatory orientation. Our examination shows that the realities of the budget process network are actually quite different. Specifically, the results show that "capturing the language" of participation while maintaining a traditional "command and control" emphasis can impair management credibility and undermine the effectiveness of processes such as participatory budgeting.

While these results identified a "rhetoric-reality" gap with respect to budgeting at APCO, it should be noted that executives at APCO commented that the results of this study provided rich insights about employee perceptions. Company executives agreed that future budgeting efforts would attempt to more closely align budget goals, processes and outcomes. Participating managers felt the study offered an avenue to express these concerns and to develop an integrated perspective for future dialogue.

In conclusion, this study of participatory budgeting at a large, publicly-held U.S. company provides a concrete example of a C/P structure. The integration of structural and qualitative data provides a foundation for enriching academic and practitioner understanding of corporate programs. Management communication and control systems are playing an increasingly important role in corporate strategy and accountability. Simply adopting programs and practices is not a guarantee that a firm will be able to achieve its communication and performance objectives. Our data suggest that while participation is commonly considered to be beneficial for organizations, a "rhetoric-reality" gap may undermine management credibility and impair process effectiveness.

Last, this study demonstrates that senior management must be aware of the firm's underlying social structure. Implementing programs solely related to formal hierarchy may be inadequate to achieve desired goals. This research identifies important considerations regarding the tension inherent in balancing empowerment and control in the modern organization that attempts to adapt to increasingly competitive markets.

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