

COST ACCOUNTING IN US CITIES: TRANSACTION COSTS AND GOVERNANCE FACTORS AFFECTING COST ACCOUNTING DEVELOPMENT AND USE

By

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Submitted to the graduate degree program in the School of Public Affairs and Administration and the Graduate Faculty of the University of Kansas in partial fulfillment of the requirements for the degree of Doctor of Philosophy.

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COST ACCOUNTING IN US CITIES: TRANSACTION COSTS AND GOVERNANCE FACTORS  
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## Abstract

Cost accounting in government is a topic that has an oddly uncertain place in financial management. Many people know what it is as an ideal construct but do not know what it is in practice. This uncertainty of practice and strong expectations about what it should be creates a tightrope that must be consciously attended to and exacts a toll on those who study its practice. For example, activity based costing, or ABC, was generally presumed to be the state of the art for cost accounting in government (Geiger, 2010). While there has been much research about cost accounting in the context of private organizations, the literature on cost accounting in public organizations has not kept pace with its development for the past two decades, especially when many public organizations are experiencing fiscal stress and there is a renewed interest in the subject of cost measurement and containment. This thesis reviews the development of cost accounting research and practices, including the practice of a hybrid of traditional cost accounting and ABC. The research then applies transaction cost theory and a variety of contextual factors that are supported in the literature to create a theoretical model of how cost accounting is used in public organizations. The model is tested on a case study of an ABC implementation in a small city. The insights from this analysis are corroborated through the analysis of the cost accounting practices in a sample of 30 large US cities. The hierarchical logistic regression of 1122 services in these cities finds that the transaction cost variables of asset specificity and uncertainty are significant factors that influence which services get measured in the cost accounting plans. The final empirical chapter looks at why cost accounting is used in US cities and shows that fiscal stress is related to US cities using cost

accounting. The last chapter draws conclusions from the current research and discusses avenues for future research.

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In addition to exceptional faculty, the University of Kansas has strong partnerships with an extraordinary range of practitioners with excellent experience in cities and public

organizations. The KU public administration graduates (known as KUCIMATS - Kansas University City/County Managers and Trainees) provided early and continuing support for this dissertation. Their professional insights were invaluable to this research. Along with the graduates of KU public administration, I need to thank the hundreds of city finance and budgeting staff in many communities that have helped with this and other research projects over the years. It is usually only with their assistance that academic public administration can have insight into the practice of financial management in public administration.

At the east entrance of Wescoe Hall, there is a sign that reads “It takes a campus to graduate a student.” In my case, that is especially true. I want to thank Paul Johnson and Aaron Bolton at the Center for Research Methods and Data Analysis, Paul Mason and the KU Accounting Department, and Liana Silva at the KU Writing Center. I gratefully acknowledge the financial support during my first and last year of the University of Kansas Fellowship, which was facilitated by the work of Dr. Charles Epp in the School of Public Affairs and Administration.

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## List of Acronyms

ABC	Activity Based Cost Accounting
ABM	Activity Based Management
CAFR	Comprehensive Annual Financial Report
	Center for Advanced Manufacturing
CAM-I	International
DHHS	Department of Health and Human Services
FEMA	Federal Emergency Management Agency
FTE	Full Time Equivalent Employees
GM	General Motors
GPS	Global Positioning System
ICC	Interclass Correlation Coefficient
IT	Information Technology
NLRB	National Labor Relations Board
PA	Public Administration
PD1	Production Department 1
PD2	Production Department 2
PFM	Public Financial Management
TCA	Traditional Cost Accounting
TQM	Total Quality Management
US	United States of America

## Chapter 1: Introduction

Cost accounting systems such as activity based costing (ABC) have generally been presumed to be state of the art for cost accounting in government (Geiger, 2010) and are a prescriptive model for cost accounting in public organization. Textbooks on the subject of cost accounting (Finkler, 2012; Horngren et al., 2011; Kaplan and Atkinson, 1998) generally give the impression that ABC is the best available cost system. Indeed, ABC can develop better cost estimates than the alternative cost accounting systems. However, it is more time consuming and resource-intensive, which should not be ignored in the theoretical model of cost accounting system choice. Focusing solely on ABC as the model for cost accounting in public organizations also negates the practical frameworks for cost accounting that have developed in practice. Additionally, cost accounting research and theory in public organizations has not kept pace with the research on cost accounting implementation practices in private organizations. Even though the subject of cost accounting in government is experiencing renewed interest among scholars and practitioners, especially in the context of growing fiscal stress and being asked to do more with less, existing research on the topic has been described as “underdeveloped” and “limited” (Lienert, 2008; Rivenbark, 2005; Robinson, 2007). Hence, those practitioners and researchers who want to use cost accounting to manage the cost of their organization find themselves without the guide of updated research or theory.

This thesis applies transactions cost theory to study cost accounting utilization in local governments. It examines theoretically why transaction costs are important to the practices of

government cost accounting, and then tests the theory of transaction costs effects on cost accounting through both statistical analysis and a qualitative case study.

Theoretically, the dissertation contributes to an understanding of transaction cost theory in the arena of government financial management, which has been noted as being important but little used by public financial management scholars. Bartle and Ma acknowledge, “As an area of study, public financial management (PFM) is in need of a theoretical orientation that would move it beyond the dominant normative “best “practice framework .... Although several theorists have recognized the potential of transaction cost economics, such potential remains unrealized” (Bartle, 2004). This study contributes to an understanding of how transactions costs, fiscal stress, and contextual factors affect the development of cost accounting in local government.

The first chapter looks at why cost accounting is an important topic, especially in the context of local government. The chapter then reviews the recent history of cost accounting reforms in government. While cost accounting has long been a part of government financial management, the forces of fiscal stress and technological improvement make the investment in cost accounting even more attractive to public organizations than ever. The chapter also examines briefly the forces that resist cost accounting, which provides the context for further discussion of this topic in the remaining chapters.

The second chapter describes the traditional forces that affect the implementation and development of cost accounting in public organizations. Transaction cost theory is used to show that the optimal cost system to be utilized in a general purpose government will likely

deviate from the positive accountancy model of cost systems that guides cost accounting development in private corporations. The fiscal stress acting on the government and organizational factors of the public sector also influence the cost accounting practices used by public organizations. The model suggests that ultimately, the cost of cost accounting must be compared to its benefits to determine the type of cost accounting that is right for an organization. The full cost to the organization, however, should include the transaction costs and benefits of cost accounting to public organizations, which is a factor that was usually ignored in the past studies of cost accounting in the public sector.

The third chapter describes the relevant features of hybrid cost accounting that has emerged recently in public organizations. Both ABC and traditional cost accounting are thought to be the pure forms of an ideal type but are seldom practiced according to the recommendations in textbooks. The hybrid type of cost accounting system is therefore developed as both a practically relevant and theoretically important type of cost accounting system. This framework aids the practical theory developed as it moves the discussion of cost accounting beyond the simple discussions of ABC and traditional cost accounting. This framework also suggests that pure ABC systems are unlikely in government and that cost accounting in government will have elements of both ABC and traditional cost accounting. The differences found within the hybrid form are interesting from the lens of transaction cost theory and provide the basis for further discussion of how transaction costs affect the utilization of cost accounting system. Some services and not others in the hybrid cost accounting system may have their indirect costs measured, which becomes an important



practical question that may indicate why cost accounting is resisted in many public organizations.

The fourth chapter is a case study and qualitative analysis of a small local government's development of an ABC system to show how transaction costs affected this organization's ABC implementation. Fiscal stress and contextual characteristics influence the development of the cost accounting system in local governments. Transaction costs are found to play a key role in the cost system's development. Leadership is also found to be essential to the development of the ABC in the small city case.

The fifth chapter analyzes empirically the effects of transactions costs on the actual cost accounting systems of city governments in the United States with populations over 100,000. It shows that the transaction cost variable of asset specificity reduces cost system development, as anticipated by theory. At the same time, service level measurement uncertainty, another transaction cost variable, is positively related to cost measurement, which is counter to the transaction cost theory. This finding is corroborated with a mixed finding relative to performance measurement and indicates that cost measurement may be pursued for different purposes in the hierarchy of public organizations.

The sixth chapter is a discussion of the factors that influence the likelihood of a city having a cost accounting plan. It is found that fiscal stress plays an important role in cities using cost accounting. Hence, this is one of the few studies that provide empirical evidence of the relationship between city fiscal stress and cost accounting usage.

The seventh chapter is a review of the lessons learned from the case study and statistical analyses. It presents a refined model of factors that influence cost accounting. Then it extends the discussion to the implications of this research on other public administration issues, such as contracting and governance. Finally, it discusses a theory of governance and financial management and then concludes by suggesting that in a world marked by increasing fiscal stress and growing pressure on governments to do more with less, there is a continued call for more studies in these areas.

### **The Need for Cost Management in Government**

As a general concept, the need for cost management in government is a topic that few citizens would oppose. No one opposes the idea that the federal government should not spend thousands of dollars on a hammer and no one opposes the idea that the local police force use the lowest cost service provider to adequately maintain its vehicle fleet. In difficult financial times, the most is expected of managers when it comes to service delivery cost and to manage one's costs is a platitude that borders on the obvious. Of course these ideas meet the hard realities of actually determining the true cost of services in public organizations, forging agreement on which estimate of cost is appropriate, and then managing the costs. In spite of strong exhortations and the logic of cost efficiency and effectiveness, accounting for the full costs of public services, both direct and indirect, seems to be a challenge that has not been adequately developed in public organizations, which tend toward less cost accounting than seems warranted based upon the purported benefits (Geiger, 2000; Premchand, 2006; Turney, 2010).

In spite of the forces that resist cost accounting and cost management, there are strong reasons to believe that there will be increased demand for cost accounting and cost management in government for both the short and long term. This section reviews the sustained fiscal stress of governments, the increasing awareness and management of performance, and the decreasing costs of technology, which make cost management more relevant than ever.

The first reason that cost accounting is increasingly important is due to the extreme fiscal stress that most governments are facing due to the recessions of the last decade and increasing competition for resources. Cost accounting helps this situation in two ways: through process improvement and through better decisions about service alternatives and tradeoffs. As a management tool, cost accounting utilizes cost information in conjunction with quality management, process reengineering, variance analysis and other initiatives to manage costs (Brimson et al., 1999; Geiger, 2010; Horngren, Datar and Rajan, 2011). During times of fiscal stress, the government may also need to make cuts to its budget and prioritize services. By providing better process and cost information, cost accounting provides important information on which to base financial decisions.

With the reduction in fiscal stimulus and the deep recession of the last few years, cities and states are struggling to find ways to balance their budgets. One report by the National Association of State Budget Officers indicated that states had to cut \$7.8 billion from their mid-year 2011 budgets and revenues and still have not returned to pre-recession levels (NASBO, 2011). It is easy to dismiss the stories and the dire predictions for local units of government as

either rhetoric or temporally isolated events. What is often lost in all of the national discussions about the “current crisis” is just how difficult it has been for state and local governments in the last decade. Historical data show that state and local government surpluses, revenue net of expenditure, has continued to decline over the last half century (Figure 1.1). The last decade in particular has been extremely difficult with more years of deficit on the aggregate than years of surplus (Table 1.1). In total there were six years in the last decade with an aggregate deficit, and there were more years of aggregate deficit in the last ten years than in the previous forty combined.

[Figure 1.1]

[Table 1.1]

According to the GAO (2011), the future does not look much brighter for state and local governments (Figure 1.2). The estimates that were conducted in April 2011 suggest that state and local governments will have persistent yearly deficits without policy changes. The pain of the state and local governments is not localized either. The Center for Budget and Policy Priorities (McNichol et al., 2011) notes that the deficits that resulted from the most recent recession are much larger than the recession of the first part of the decade and that 42 of the 50 states had budgeted shortfalls for 2012. With the stimulus money running out in 2012, state and local governments have been forced to make difficult tradeoffs in the level and types of services that they provide.

[Figure 1.2]

While this discussion has focused on state and local government, most government and non-profit organizations have to better target their priorities, and efforts must be made to root out inefficiencies. The first way that cost accounting helps government and public organizations during cutback scenarios is through efficiency gains (Brimson, Antos and Collins, 1999; Kehoe, 1995; Turney, 2010). Cost accounting develops an organization-wide understanding of what drives costs for organizations. Public organizations can then take this information and improve their processes to drive down costs. The other way that cost accounting helps public organizations balance their budgets and become more efficient is by providing accurate cost data that can facilitate cost comparisons. If the government is inefficient relative to the service market, the information provided by cost accounting may be used to either improve service or contract the service to another organization to provide the service. If the government is inefficient relative to another government or organization, it can trigger organizational learning. If a government is inefficient over time, it can change its processes so that it does not continue to be inefficient. By becoming more efficient, the government can make better use of its resources and deal with the fiscal stress in a way that does not decrease public service.

Government organizations may also choose to alter service levels or to target their cuts to minimize the loss of welfare. Analysts and the public express a desire for the cuts to governmental services to be better targeted (Greenstone and Katz, 2011). The members of the Simpson-Bowles commission wrote of the federal government, "We must create a more cost-effective federal government and root out waste wherever we find it. Discretionary spending can be better targeted..." (Simpson et al., 2011). Public finance has long understood that any cuts to government should be made strategically to minimize welfare loss. Advanced cost

accounting, such as ABC, facilitates strategic cuts by allowing an accurate comparison of the cost of services. Any distortion to the price of a service, of necessity, requires a corresponding set of distortions relative to other budgeted services. These distortions can make comparisons between products or services misleading and the *relative* merits misleading (Finkler, 2012; Horngren, Datar and Rajan, 2011; Kaplan and Atkinson, 1998). To the extent that a better cost system produces better estimates of service cost, the comparisons for the best service levels are made correspondingly better as well.

Cost management can also be combined with other performance initiatives, which use accurate cost data to improve performance. The use of performance management at all levels of government in the United States (Berman and Wang, 2000; Ho, 2006; Joyce, 1993; Metzenbaum, 2009; Moynihan, 2008; Radin, 2006) and internationally (Andrews et al., 2006; Lee and Wang, 2009; Pollitt, 2006) continues to develop and improve. Performance budgeting (Gilmour and Lewis, 2006; Kelly and Rivenbark, 2003; Moynihan, 2006) is also an important recent development for which the use of more accurate cost information is extremely valuable (Premchand, 2006). The performance movement, as it has been called, can use better cost data, and better cost data can better inform theories of performance. It is apparent to many scholars that cost data and performance data mutually benefit each other and the recent rise of the performance movement could spur many organizations into considering intensive forms of cost accounting such as ABC.

The first way that performance management can use better cost data is to put outcomes into perspective. It makes no sense to measure and benchmark services when the

level of resources that went into making that service are different or inconsistent (Ammons et al., 2001). It is also well known that efficiency measures lag behind other measures of performance particularly output measures that are generally easier to measure (Ho and Ni, 2005; Julnes and Holzer, 2001). Accurate cost data is therefore useful for benchmarking services and evaluating efficiency both within and between organizations.

Performance-Based Budgeting (PBB) can also use more accurate cost data to drive budgetary decisions (Moynihan, 2006). While simple-minded performance budgeting **will not work** because it does not relate well to the other budget systems or actors, the modern conception of performance-informed budgeting (Joyce, 2005) is a more loosely coupled relationship. Cost is thought to be an important performance metric and this could factor into budget discussions to help inform budgetary conversations. Another important argument is that government workers are no longer the budgetary base around which “incremental” adjustments are made (Premchand, 2006). Premchand notes that the analysis of the activities of government that are developed during an ABC process could logically serve as the budgetary base. Almost all empirical studies of public budgeting suggest that the democratic tug of war that leads to the incremental budget adjustment is necessary for a flexible budgeting system (Rubin, 2009; Schick, 1990; Wildavsky, 1964). In light of the recent fiscal crises, it can no longer be doubted that the old politics of the budgetary process is broken but performance-informed budgeting, of which cost accounting can play an important part by providing accurate cost information to inform democratic discussion, may provide a stable base upon which public resource allocation decisions can be made.

Performance may also be related to cost accounting because of increasing awareness of it by professionals in local government. The normative pressure of professionalism (DiMaggio and Powell, 1983; Wilensky, 1964) may raise the value of cost accounting in performance terms. Professional practice of government is, therefore, highly likely to be associated with more extensive utilization of cost accounting. The organizations that have performance initiatives or aspirations are more likely to utilize ABC and cost accounting. Organizations that are similar to each other and try to learn from each other are also more likely to utilize the same or similar technology. Within public administration and management theory there is growing awareness of networks (Agranoff and McGuire, 2001; O'Toole Jr, 1997). While there is only one true network of organizations that has been formed to link their cost accounting structure, the North Carolina Local Government Performance Measurement Project (Ammons, 1995; Ammons, Coe and Lombardo, 2001; Coe, 1999; Rivenbark and Carter, 2000), there is mounting evidence that managers network and collaborate on both physical and administrative projects (Thurmaier and Wood, 2002). As a result, it is reasonable to expect that as public organizations become more familiar with cost accounting and begin to experiment with the tool, they will likely talk to their neighbors about their experiences, thus helping to increase the awareness of the practice in their local government networks.

The third reason that cost accounting may be used in local government is because it may be required for federal grants. Organizations that receive over \$500,000 from the federal government are required to file single audits. If the public organization is going to count any indirect expenses, such as building space, utilities, or other administrative expenses, to go along with the direct expenses charged back to the grant, they must have a cost accounting plan on



which to base their indirect cost rates (Circular A-87, and 2 CFR Part 215). Other programs that include the need for cost accounting are the Federal Emergency Management Agency (FEMA) disaster assistance, which requires that to be reimbursed for time spent cleaning up after a storm or natural disaster, local entities must keep separate records that also account for indirect expenses. The coercive pressure of grant funding makes local public organizations more likely to have a cost accounting system.

Finally, the price of technology for cost accounting continues to fall (Turney, 2010). As a result, more public organizations have adopted enterprise resource planning systems and other advanced information technology in the course of their ordinary business. Further advances in ABC, such as time-driven ABC (Kaplan and Anderson, 2007, See also Chapter 2), uses the available technology more efficiently. Other advancement in technologies, such as Geographical Positioning System (GPS), that can automatically track activities, may make once impossible data collection possible. As the costs of these technologies continue to decrease, the net benefit from cost accounting in decision making and management will increase.

The case for an analysis of cost accounting is bolstered by the factors just discussed. Nonetheless, there are also counter forces against cost accounting in government. For example, while it is true that the federal grant process may require cost accounting, simple cost reporting systems that are not sufficiently developed may fulfill the legal compliance requirements but may not be equipped for effective cost management. This is an oddly counterintuitive relationship but it can happen in reality. This is because the federal requirements may promote cost estimates that excessively distribute overhead to grant-funded

activities. While this makes sense from an open systems perspective because local organizations may want to take in as many resources from the grantor as it possibly can, the rational allocation of goods and services becomes distorted. The government cost accounting system also promotes a distorted cost because full cost recovery promotes an inadequate separation of the hierarchy of costs, which distorts prices and limits management uses (Flury and Schedler, 2006). The distortion of the cost of goods and services is the exact opposite of what is needed for cost management. From a cost management standpoint, it is much better to know the true costs of goods and services so that they can be managed to either decrease the cost, increase quality at equivalent cost, or both decrease cost and increase quality. The coercive pressure of the federal grant system thus tends to promote some development of cost accounting, but it may distort the intention of cost management and reduce the incentive to develop highly advanced and accurate cost accounting systems.

Other factors may also paradoxically propel and resist cost accounting and cost management development. Fiscal stress is presumed to lead organizations to focus on cost management. However, fiscal stress may also lead to resource constraints that limit the ability of governments to implement cost accounting and cost management. This situation is common for public organizations that need to respond to fiscal stress but also need resources to develop and manage the implementation of their innovations (Fernandez and Rainey, 2006). Past studies have shown that slack resources are positively related to the adoption and implementation of performance information use in local governments in the U.S. (De Lancer Julnes, 2010). Hence, the lack of resources can limit the utilization of managerial reforms such as performance measurement and cost accounting in the implementation stage. While cost

accounting and cost management may be more attractive for governments during periods of fiscal stress, it may actually be harder to implement and less likely to be utilized over the long run.

Similar to the resource constraints during fiscal stress, leadership and professional management is assumed to be a primary reason for a greater usage of cost accounting in government, but, like resource constraints, it might also be limited by other competing priorities. Studies of innovation in government note the importance of leadership in establishing and routinizing an innovation in a public organization (Fernandez and Rainey, 2006; Julnes and Holzer, 2001; Moynihan and Pandey, 2005; Rogers, 2003). Leadership is critical to the management of innovations primarily in the implementation stage as organizational members need to see that the innovation is still supported and leadership can help the organization overcome the problems of implementation. However, like financial resources in public organizations, public organizational leaders continue to find themselves stretched to demonstrate performance (Van Slyke and Alexander, 2006), be entrepreneurial (Denhardt and Denhardt, 2000), and continue to respond to legal and political constraints (Rainey, 2003). As a result, while leaders may be more aware of the professional need and desirability of cost accounting, they are also required to be attending to other organizational imperatives as well. Public sector leaders have also been shown to be more likely to make decisions based more upon bargaining and less upon analysis relative to private sector managers (Nutt, 2006). As a result, public sector managers may realize the importance of cost accounting and performance management: they may believe that it is not as critical as other more immediate needs demanded by various organizational stakeholders.

The final countervailing force that is readily apparent from the literature is a lack of core knowledge about the best way to implement and develop cost accounting in governmental contexts. As was previously noted, the literature on cost accounting and cost management in government is paltry and is especially limited given the large focus on it in business and accounting literature. Research on cost accounting appears in the main journals in the accounting field such as *Journal of Accounting Research*, *Accounting Review*, and *Accounting, Organizations, and Society*, which all publish articles on cost accounting and cost management. Cost management has its own cadre of business journals that publish exclusively cost management-related articles in journals, such as *International Journal of Strategic Cost Management*, *International Cost Management Journal*, *Cost Management*, and many other general managerial accounting related journals. There are important organizations that are also devoted to the study and dissemination of cost accounting and management information, such as CAM-I. In spite of all of this business-related research, public administrators are not extensively exposed to this information. Few graduate programs in public administration have dedicated courses in managerial or cost accounting. Few of the leading public administration journals have articles that feature cost or managerial accounting (with the exception of articles about the Balanced Scorecard and performance measurement), and even the public budgeting and financial management journals do not regularly publish articles on the subject. The public sector practitioners are increasingly aware of the need for performance systems and may likely be aware of the need for better cost management tools, but the lack of information and research on public sector cost accounting limits the core knowledge of practitioners. The lack of knowledge and places to get that knowledge for public sector managers remains a key

countervailing force, particularly as it concerns long term use of cost accounting and management in public organizations. This research therefore seeks to address this deficit with an exploration of both what cost accounting is and also what affects its utilization in general government settings.

### **A Recent History of Cost Accounting Research**

A recent history of cost accounting and management reforms has much to tell us about the battle of forces for and against the development of cost accounting in public organizations. In *Relevance Lost*, Kaplan and Johnson (1987) explore the changing nature of businesses that necessitated a better cost accounting system that went beyond the traditional forms of cost accounting. In the 1980s many companies were recognizing the force of global competition and were dealing with increasingly thin profit margins. Increasing overhead and increasingly diverse product lines were making obsolete the traditional cost accounting systems that had been around since the end of the 19<sup>th</sup> century as companies added product lines that complicated the evaluation of the cost of the product and obscured the ability of the company to determine a profitable price. In a string of papers that culminated in a book on the topic, Cooper and Kaplan conceived of activity-based costing and developed the main concepts of the technique (Cooper, 1990; Cooper, 1988; Cooper and Kaplan, 1988; Cooper and Kaplan, 1992; Kaplan and Cooper, 1998). ABC became the most readily apparent cost accounting system relative to the traditional forms of cost accounting<sup>1</sup>. ABC generally recognizes the need for more specific awareness of the activities that are performed on products or services and uses specific cost drivers to manage costs. Industries such as the automotive and the steel industry

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<sup>1</sup> See Chapter 3

experimented with ABC concepts in the late 1980s and early 1990s (Anderson and Young 2001). Eventually, ABC and Activity Based Management (ABM) emerged to allow more accurate cost estimates for products and services and to provide a complimentary set of tools for using ABC information.

Turney (2010) argues that it was in the mid-to-late 1990s that companies went through a period of “disillusionment” after ABC failed to meet the very high expectations that companies had in the early 1990s and after many companies experienced difficulties in implementing ABC on an organization-wide basis. Research in that period showed that companies were having a hard time routinizing ABC for their organizations once they had initially implemented it (Anderson and Young, 2001). It was not until later that new forms of ABC have developed to address many of these challenges<sup>2</sup> (Kaplan and Anderson, 2007), which lead to a steady incline in its real usefulness to companies again.

In the early to mid-1990s, there was also great interest in ABC in government. One GFOA survey put the number of cities that had either adopted or were looking to adopt ABC at greater than 50% (Weiss, 1997)<sup>3</sup>. A few especially innovative organizations like the City of Indianapolis reported cost savings from the technique (Kehoe 1995). More recent estimates note that this number has declined significantly, with only 16% of cities over 100,000 population responding that they utilize ABC (Kennett et al., 2007).

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<sup>2</sup> See also Chapter 3 for a review of new developments in ABC and cost accounting.

<sup>3</sup> Michels (2003, 143) notes that in the early 2000s 75% of large county governments and nearly all states reported that they were doing ABC at least in some departments or agencies. However, only 3% of counties say they used it in almost all agencies and only 22% of states said that they used it in almost all agencies. There is no recent data to suggest a change in use.

While some public organizations reported a certain degree of success from their ABC efforts, the public financial management community in the 1990s generally condemned ABC for its apparent problems in the governmental context. Foremost among the problems of ABC was the cost of actually developing and using ABC, which was seen as especially prohibitive for smaller organizations (Brown et al 1999). Other concerns included the inapplicability of cost information to government budgeting because budgets are developed on an obligation basis rather than total or unit costs (Anthony 1999) and the fact that government does not usually sell its services (Brown et al 1999). Furthermore, ABC was criticized for being overly relied upon for contract decisions (Mullins and Zorn 1999). It was noted that many governmental services must address both positive and negative externalities that cannot be captured by accounting systems without the use of more sophisticated evaluations of externalities such as benefit-cost analysis. Furthermore, criticisms have been raised in the United Kingdom concerning the demands that ABC places on local police forces (Flanagan and Britain, 2008) and the dysfunctional behavior that results from departments such as the police from gaming the system (Collier, 2006). The academic research on local government use of ABC and ABM seems to have come to a halt in the United States following this barrage and only recently has interest rekindled towards management accounting in public organizations (Rivenbark, 2005).

In spite of the fact that there has been little academic research done on cost accounting in local government, there has been some research on it in the federal government (Martin, 2007; Miller, 2009). Extensive case analysis and some limited theoretical attention have been developed, particularly for the military (Geiger, 2000; Geiger, 2010) and non-appropriations agencies (Geiger, 2010; Geiger and Ittner, 1996). With the exception of the Geiger studies, the

research on the federal government has been mostly descriptive of the lack of progress being made in the area of cost accounting in government.

While the general accounting literature already discussed recognizes that there are two primary considerations to a cost accounting system, usefulness and affordability, Geiger develops a theory that the third key dimension of a government cost accounting system is its credibility (Geiger, 2000; Geiger, 2001). The reason that credibility is an important concern in the governmental setting is because of the principal-agent problem, which will be discussed in greater detail in the following chapter, and the need to have data that can withstand public scrutiny. Business management does not have the same principal-agent problems as public organizations do, and is not as affected by the need to withstand scrutiny, especially if the business is a private corporation (Geiger, 2000). To overcome the principal-agent problems in the public sector, Geiger suggests that government cost information should have greater credibility, and this happens through an evolutionary process rather than a simple off the shelf implementation of a given cost system such as ABC.

His recent book begins with this evolutionary perspective and notes that cost systems, at least in the federal government, have a mixture of ABC elements and more traditional cost accounting elements, such as basic cost drivers. The experience of the military is especially interesting given the drastic differences between the cutbacks in the 1990s and the vast increases in military expenditure in the 2000s. This change in the environment of the military has hurt the everyday efforts to manage costs, but led to a unique system of cost management that is even recognized by CAM-I (Vadgama et al., 2006). This system of cost accounting in the



military is even having policy implications as the military now has a reasonable estimate that the cost of providing a soldier in Afghanistan for one year is \$850,000, which includes the cost of “special allowances for being there, the money spent for supporting other coalition forces and even a share for costs of the organization that produces protective devices used to discover improvised explosive devices.” (Pincus, 2012).

The problem with applying Geiger’s work broadly is that it relies upon three critical aspects of the military culture. The first problem is the assumption that everyone knows and shares the objectives of the cost management, such as winning a war. A reliance on the mission culture of the military and the leadership opportunity that this provides in the area of cost management is likely not as applicable to the general purpose units of government, especially at the local level. Second, Geiger suggests that the implementation of cost management can rely upon hierarchy and span of control to decentralize decision making and push cost management activities down through the organization. However, in many general-purpose governments where strict hierarchy may not be as strictly enforced as it is in the military, this necessary condition of hierarchy may not exist. Finally and most importantly, Geiger assumes that funds can be reprogrammed. The cost savings that is achieved can be used for other individual or organizational purposes. While this is generally applicable to the military and the non-appropriations agencies that he has studied, this would not hold in a general government budgetary setting such as a local government. One is reminded of Donna Shalala’s work in the Department of Health and Human Services (DHHS) where she worked to find efficiencies in the agency’s operation just to have Congress reappropriate her savings (Rubin, 2009). Shalala said that she learned not to be overly concerned about efficiency from

this experience. Geiger tends to take the position that the savings that can be found in one branch of the military can then be used to help that same branch. This seems a strong assumption, especially when it comes to the general government settings. Geiger's analyses of government cost system and cost management efforts are enlightening, but they are ultimately limited by the unique contexts under which relatively strong forms of cost accounting and cost management thrive.

### **Chapter Conclusion: The Need for a New Public Sector Cost Accounting Research Agenda**

Cost accounting research is receiving renewed interest from managers and scholars who understand the forces of fiscal stress and technological and social change that are promoting the development of cost accounting in public organizations. However, the forces that resist cost management are significant in public organizations that are experiencing shortages of financial, administrative, and information resources for cost accounting and cost management. The following chapters generally discuss the important effect of resistance that stems from transaction costs on the development of cost accounting in public organizations.

## Chapter 2: Theories of Public Sector Cost Accounting Utilization

The previous chapter noted the need for cost management and discussed some of the resistance that cost accounting often encounters in public organizations. While this resistance is not encountered solely by public organizations, there are theoretical reasons to believe that it is different than much of the resistance that is faced in private organizations that do not have problems of public oversight or competing demands that are distinctly different from the corporate imperative of profit. Cost accounting in public organizations is the same in many respects to corporations, but in many other respects it encounters unique pressures. The theory developed in this section guides the analyses of public cost accounting practices that are conducted in the following chapters.

The main question that the subsequent research seeks to address concerns the utilization of cost accounting in general purpose units of government such as cities. Utilization is focusing on the type or intensity of cost accounting that is being used<sup>4</sup>. Generally, a more intense cost system is one that measures services as accurately as possible with specific cost drivers, and a less intense form of cost accounting measures fewer services with more general cost drivers. The first question is whether fiscal stress promotes cost accounting in public organizations as cost accounting proponents suggest it should. The second general question is whether transaction costs affect the development of cost accounting utilized by public organization. The final group of questions concerns which contextual factors influence the cost accounting utilized by public organizations.

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<sup>4</sup> The different types and intensities of cost accounting are discussed more in Chapter 3.

The first section of this chapter discusses the positive accountancy model of cost accounting. The positive accountancy theory suggests that there exists one preferred cost accounting system for an organization and that is the one that minimizes the cost of errors and the cost of data collection. Based on the positive accountancy model, organizations that are experiencing fiscal stress should have a greater use of cost accounting than those that are not. The second section of the chapter discusses why the bureaucratic politics in a public organization can effectively shift the preferred optimal cost system in public organizations and may result in several preferred cost systems from the perspective of the multiple principals in public organizations. The third section inserts transactions costs into the theoretical discussion of what determines the type of cost accounting system used in local governments. The final section looks at other contextual factors that influence the implementation of cost accounting in public organizations and presents the theoretical model that will be used to analyze how transaction costs influence cost accounting.

### **Positive Accountancy Theory**

Positive accountancy theory (Kaplan and Atkinson, 1998; Watts and Zimmerman, 1990) suggests that the best method for determining the appropriate cost system is the system that minimizes the combined costs of cost system errors and the costs of measurement (Figure 2.1). The lowest combined cost of measurement and error is the level of accuracy and detail needed for the ideal cost system. The positive accountancy model depicts a single cost system that is optimal for an organization.

Cost system errors are the errors that an organization makes in terms of resources deployed to non-optimal – or inefficient – processes. The case of the non-optimal process occurs when there are two roughly equivalent processes but, because of cost system error, one of the purposes is erroneously used because it is thought to be the less expensive option. The other way that cost system error affects the bottom line is by hiding inefficient processes, which makes them seem efficient compared to other internal or external alternatives.

The other commonly recognized source of cost for cost accounting systems is the cost of measurement, which can include labor hours putting the system together, the cost of the technology to support the system, and the labor to maintain and use the system. Many sources note that ABC system designers have a tendency to overemphasize the process of developing the system, particularly in the cost driver stage, and so it has a reputation of being a cost system that tends toward excessive cost of measurement. The experts suggest that the optimal system, though, is one that balances the cost of both the errors of the measurement system and the cost of measurement itself.

The optimal system is the point at which we minimize the costs to the system (Figure 2.1 Adapted from Kaplan and Atkinson 1997, 112). The positive accountancy model, therefore, highlights two primary variables of interest when determining the cost system choice. The first being the cost of error and the second being the cost of measurement. To the extent that any system decreases the cost of errors, it represents a benefit, but this must be weighed against further costs of measurement. The positive accountancy model suggests that one cost system

is appropriate for an organization, and that it can be determined by consideration of the minimization of total costs.

[Figure 2.1]

The key insight from Kaplan and Johnson's work was that increased global competition was forcing businesses to be more concerned with accurate product costs. This market competition was forcing companies to have a higher cost of error when the cost system was wrong. When the company underpriced its products and services, the global market quickly consumed the underpriced products and the company lost more money. When the cost of products and services was overpriced, the products and services were quickly replaced by imported alternatives (Johnson and Kaplan, 1987), which led to the company losing money and market share. This led to the development of ABC (Kaplan and Cooper, 1998) and better cost accounting. It has often been noted that the corollary of increased competition in business is fiscal stress for government (Brimson, Antos and Collins, 1999; Kehoe, 1995). As governments must search for ways to become more efficient and to better target priorities, there is a growing need for more advanced forms of cost accounting in government.

The first factor that is expected to influence cost system development is the presence of fiscal stress. As fiscal stress increases, advanced forms of cost accounting become increasingly beneficial for the organization. With increased fiscal stress, there is less mitigation for the organization and slack resources are at a premium. The reduced resources, however, may act to reduce the ability of the government to implement cost accounting in the face of fiscal stress. A higher cost of measurement system might be desirable for public organizations, but it

might be stymied by a lack of resources. Like other responses to fiscal stress in public and private organizations, cost accounting is limited by the resources that are available (Levine et al. 1981). The well-documented proposition that fiscal stress leads to more advanced forms of cost accounting, such as ABC, suggests that one of the primary reasons for cost accounting in government is to deal with the long-term effects of fiscal stress by implementing an optimal organizational cost system that minimizes the cost of errors and the cost of measurement.

### **The Bureaucratic Politics of Cost Accounting in Cities**

The above theory looks at the adoption of cost accounting from a purely economic perspective. However, not all organizational behaviors and decision-making are completely driven by the need for cost minimization, particularly in public organizations. Hence, this study also looks at bureaucratic politics that can surround the determination of the cost system optima. The added benefit of examining the factors that surround the cost system choice is that it gives a more realistic assessment of the likely forces that will affect the cost system adoption and implementation choices. Bureaucratic politics, gaming, and bureaucratic control models suggest that the agents in the system may be able to influence the cost system choice and distort the cost considerations of adoption, implementation and ultimately the utilization of cost accounting.<sup>5</sup>

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<sup>5</sup> Throughout the remainder of the section, I will refer to two groups. The first is operational managers which are the managers that have specific knowledge about activities and services provided to the public. The upper level managers such as the City Manager or City Administrator are taken to be part of the legislative coalition. The City Manager or City Administrator often works directly for the legislative body and can often be dismissed by that body without recourse to organizational dismissal or union safeguards. It is anticipated that upper level managers will be more aligned with the legislative body's preferences. However, a more general dynamic exists and that is the dynamic of principal and agent. For purposes of clarity, when I discuss operational managers and the upper managers, the operational manager corresponds with the agent and the upper managers with the principals. In

As shown explicitly in Chapter 3 and in textbook examples of cost accounting (Finkler, 2012; Kaplan and Atkinson, 1998), the type of cost system can give a very different picture of the activities of a department or organization relative to the perceived cost. Even in government, the real price of a good or service is an important performance metric when resources are constrained. To the extent that the goods and services produced by a division or organization do not take account of the full cost of resources consumed, the more efficacious the division or organization will appear, *ceteris paribus*.<sup>6</sup> Managers want to minimize the resources that get counted in the production of the goods and services that they produce. Managers are especially interested in minimizing those resources for which they do not directly control (Simon et al., 1954). The incentive for managers is to minimize the indirect resources that get counted in the cost of the products they produce. This is not to say that managers intentionally sabotage cost systems in such a way as to be inherently misleading, but in private as well as public organizations, the incentive system is structured for managers to want the fewest indirect resources counted in the cost of the goods that they produce. The proposition that service level managers want to reduce the control by upper level managers is grounded in rational choice theory and is a key theoretical assumption about the objectives of the agents in the system.

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the graphical presentation, I will refer to it in terms of the principal-agent relationship. The reason for this is that it is possible that the upper level managers and the legislative coalition might side with the operational managers relative to the ultimate principal – the public. To keep the theoretical discussion manageable, I will refer to only the two levels of principal-agent dynamics but in reality there is a minimum of four: electorate, legislature, upper management, and the operational managers or street level bureaucrats.

<sup>6</sup> This can also lead to overproduction and underproduction of goods and services. This is not shown here because the analysis is on the adoption and implementation of cost accounting. Readers that are interested in the distortionary effects on production are referred to Kaplan and Cooper 1998 or Geiger 2000.



Two factors in public organizations influence the incentive structure of operational managers relative to private sector managers. The first factor, which tends to constrain managers' incentive to distort, is the budget of public organizations. The budget is fixed for a set period of time and it is determined mostly through an incremental process of political negotiation (Wildavsky 1964; Schick 2007). For public organizations price is only one of the factors under consideration and often of more importance are the end users that lobby for the good or service: the "clientele". In the public sector the concepts of need, capacity, and even moral suasion are at least as important in the budgetary process and often much more so than the price of the good or service. Particularly in situations where the "base" (Wildavsky 1964, Wildavsky and Caiden 1997) is not in play the price of the public good or service is not as salient as in a private organization. When budgets are constrained, however, the "fair share" cannot be distributed and the incremental politics break down. The budgetary base must be evaluated and price becomes important. In the post-World War II era, the United States was mostly on a path of economic growth and incremental increases to the budget were always possible. Hence, incremental politics did not call the budgetary base into question. However, in recent years, this budgetary environment has been challenged by prolonged fiscal stress. As a result, this budgetary problem is seen as a strong reason for the present inquiry into the causes and nature of cost accounting systems in the United States because fiscal stress reduces the budgetary base which makes incremental politics break down (Behn, 1985). However, managers may also choose to ignore the cost system in public organizations when managerial accountability is at the departmental budget level and not at the level of total cost generated by the department or in providing services.

The second factor, which tends to exacerbate the differences of preference for cost accounting systems between operational managers and elected officials, is the problem of agency in public sector organizations. In these organizations, employees can use information and autonomy to influence the price of goods and services recognized by elected officials (Kraan, 1996). For basic cost accounting systems, the process for determining the price of goods or services is a technical exercise that upper levels of management and the elected officials can engage in without concerning the day to day managers. The general bases that are used in the traditional cost accounting systems may not need to be determined in consultation and cooperation with departmental managers. In contrast, ABC systems require greater employee and management involvement in determining activities and choosing cost drivers that can attribute the cost. This increased importance of street-level workers and their direct supervisors allows for more opportunity by the department to shift the perception of the price.

For traditional cost accounting systems, department or agency budgets are usually the cost centers. Basic cost drivers such as man hours, machine hours, or building space are used to allocate the costs in a rough way. When the generic cost drivers are not accurate enough and the amount of indirect resources rise relative to the goods and services produced, the estimate of cost from the basic cost accounting system can become inaccurate and misleading. For all of its faults, the traditional cost accounting system has one major advantage over more advanced systems: it can be technically estimated without the assistance of operational managers and this avoids many of the agency problems between upper levels of management and the line managers. For ABC and more advanced forms of cost accounting, the assistance of

operational managers is required, at the very least, to define the activities and processes of production.

Operational and departmental managers may have their own objectives which may include not revealing valuable information about processes (Crozier, 1964) and thus accurate cost data. Within the broad literature of principal-agent theory, there is the idea of the budget-maximizing-bureaucrat (Niskanen 1972, 1994), which suggests that managers left to their own devices will try to maximize their own parochial interests and budgets to the detriment of the larger organizational or social interest. While this assumption about the nature of bureaucrats has been called into question (Brehm and Gates, 1999; Perry and Wise, 1990), the literature of the budgetary process is clear that departments have their own interests that can be separate from the executive or the legislative (Wildavsky, 1964; Wildavsky et al., 1997; Wilson, 1991).

Assuming that the cost system and the cost of goods and services produced is a valued performance metric, managers have the incentive to resist any cost management system that tends to raise awareness of the full cost of the products and services. Likewise, elected officials and their appointees such as city managers have the incentive to oppose this tendency and establish a cost measurement system that more rigorously evaluates the costs of services than is optimal (Figure 2.2). Legislators may want to have a more rigorous system of cost accounting for three primary reasons: historical antipathy, understanding of managerial incentives, and electoral incentives. The first reason that elected officials would tend toward a more expensive system is that – at least in America – there is a historical distrust toward government management of finances that goes back to at least our colonial heritage (Wildavsky and Caiden

1997, 25-26). The second reason that the legislature may prefer a more costly system is that the legislature understands the incentive of managers to have their programs appear as inexpensive as possible and the legislator may want to counter that tendency. Finally, legislative elected officials have the incentive to get re-elected and, to the extent that they can appeal to and appear to be tough on spending and costs, they can gain advantage in future elections.

[Figure 2.2]

Politicians can structure their own preferences into the bureaucracy either through monitoring or through establishing their preferences in rules and laws (McCubbins, Noll and Weingast 1987). Although cost systems are not generally regarded as a way that politicians try to control the bureaucracy, determining what gets counted can often determine the winners and losers of the political game of allocating resources (Wildavsky and Caiden 1997). By being able to more closely monitor departments, cost systems advantage the political control of the bureaucracy. The second theoretical assumption on which the theory rests is that city managers and elected representatives will try to control the agents through increased levels of cost accounting.

This is not to say that departments and agencies cannot exert some influence on the elected representatives. To varying degrees departments can exert some of their own preferences (Carpenter, 2001; Lowi, 1969; Moe, 2009). The agencies and departments have two ways of avoiding legislative and executive control. The first way is through the use of politics and establishing a political base to create autonomy. Wildavsky (1964) explains how

government agencies develop a client to lobby the legislature for an agency's programs. The department or agency can either gain control through the political actions of a leader by building their own base of political support (Carpenter, 2001), or the agency can gain control through a large number of workers that can get their preferred candidates elected (Moe, 2009). These very powerful forms of political preference by the bureaucracy are probably less likely for the determination of a cost accounting system, which is still seen as a mostly technical exercise. Importantly, what they indicate is that the form of the cost accounting system is open to social control and influence.

The second and perhaps the primary way that managers can control the determination of the cost accounting system is through the control of information (Buchanan and Tullock, 1967; Downs, 1967). The problem of information asymmetry arises in government agencies in the same way that it does in imperfect markets: through one party being dependent upon the other for valuable information. In the case of advanced cost accounting such as ABC, the legislative body and upper management are dependent upon operational managers for a clear picture of processes and the drivers of cost. It has long been known that managers who value their autonomy will resist attempts to understand and control their processes (Crozier, 1964). They can do this by controlling information so that the costs of control appear higher than they otherwise are or by decreasing the perceived benefits of decreasing the errors. The first is done by arguing that the system presents an unfair burden upon manager's and employee's time and is a large cost to the organization. The second is achieved by noting that more basic cost systems appear to achieve a roughly equivalent result to the more expensive and accurate cost accounting system. It is during the implementation of the cost system that the managers

can have their greatest impact and can use both information and political capital to resist cost control. The level of control of the actual cost system is thus a negotiated process that is critical to determining the costs and benefits perceived and negotiated during the implementation process (Figure 2.3).<sup>7</sup>

[Figure 2.3]

This entire discussion over the principal-agent dynamics of cost systems has been moving towards one conclusion: whatever the benefits of a cost accounting system in theory, the benefits and costs of that system will be open to interpretation and influence during the implementation process in public organizations. Any system that moves operational managers away from their preferred system of less control and more autonomy will be resisted by them to the extent that they have the ability to resist it. In the case of ABC, the cost system relies upon managerial support to understand activities and cost drivers. This indicates that, because managers value autonomy and the managerial accounting system moves them away from their preferred system; they will resist the changes upon implementation. Implementation and the transaction costs that arise in this model become critical variables for determining the overall success of implementing and utilizing cost accounting. The theory implies that a game

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<sup>7</sup> The previous discussion highlights the dynamic nature of the preferred cost accounting system relative to the preferences of the parties and their relationship to one another. It also indicates that in the public organization the type of system that gets used is independent of the economically most efficient system (optimal system) as the business literature notes would be important in a competitive market. The bureaucratic politics model that has been presented suggests that the legislature will tend toward a more controlling with greater measurement expense and the managers will tend toward a less controlling and higher error system relative to the optimum. This may not be the case as both elected officials and operational managers could prefer a system that is on one side or the other of the optimal system. If this situation arises, it seems that the elected officials and the operational managers form a unified front relative to the preferences of the public as a whole and would resist the implementation of a cost system that moves them both away from their preferred cost control system.

theoretic equilibrium will be established between the two parties, which will largely be determined by the structure of their interactions. The resulting equilibrium that emerges from this dynamic is a result of the system and the transactions costs of the system.

An important theoretical caveat exists that should be discussed because its result suggests a possibility for the current state of underdevelopment in government cost management. This is the principal-agent problem between the legislature and the public. The previous discussion has assumed that the legislature and upper management is acting as a trustee or guardian of the public's interest. However, cost savings from a reduction in cost system errors may only result in a small marginal tax decrease that benefits everyone. These general benefits may not be supported in the political process. Rather, politicians have the incentive to give particularistic benefits that benefit an individual constituency, which will then support the politician in the electoral process (Lowi, 1969; Olson, 1965). This creates a political disincentive for individuals in the legislature to show the true costs of services. Even if one objects to this portrayal of the legislature as fundamentally self-interested, other features of the system such as "garbage can" policymaking (Cohen et al., 1972) are not completely efficient from a resource consumption perspective, either. The legislature, which we have viewed as the principal to this point in the analysis of cost system choice, simply becomes the agent to the ultimate principal, the electorate. The legislature would also experience additional costs of measurement when dealing with the public and so the legislature as the agent would have the incentive to prefer the cost system with a higher cost of error. In theory at least, this may help explain the underutilization of ABC and cost management in public organizations.

This section has attempted to explain the resistance that occurs when organizations attempt to implement and utilize more intensive forms of cost accounting such as ABC to monitor the costs of many or most services. It shows that the principal and agent may have different perceptions of the optimal cost system and it indicates that the legislature may choose to side with the operational managers on the accuracy and level of detail needed in cost accounting systems. The mechanism for determining which services get measured and in what detail is expanded upon in the following section on transaction costs. Transaction costs are an important organizational cost that likely influence the way cost systems are allowed to develop and ultimately the cost accounting system that gets utilized by public organizations.

### **Transaction Cost Theory**

While the literature of cost accounting implementation has shown many factors influence cost accounting within an organization, transaction costs have not been explored as a potential factor that affects the use of cost accounting within organizations. Much of the work on the implementation challenges of cost accounting suggests that the theoretical lens of transaction cost may be appropriate. Transaction cost theory generally suggests that many organizations' activities are limited or changed by the cost of developing and maintaining transactions. The original articulation of the concept of transaction costs comes from Coase's theory of the firm and exchange within the market (1937; 1960).

“In order to carry out a market transaction it is necessary to discover who it is that one wishes to deal with, to inform people that one wishes to deal and on what terms, to conduct negotiations leading up to a bargain, to draw up the contract, to undertake the inspection needed to make sure that the terms of the contract are being observed, and so on.” (Coase, 1960 pg 15)



This foundation has led to two different concepts of transaction costs which find support within the literature (Langlois, 2006). The first is the view most often found in the literature on public organizations that tends to define transaction costs as the costs of organizing, searching for and carrying out transactions that lead to a type of friction or loss to the system. Examples of this type of transaction cost trace back through Dahlman (1979) and can be found in the public contracting literature that tends to view transaction costs as simply unrecognized costs to contracting (Johnston and Girth, 2012). Others have used transaction costs to explain the loss of efficiency in exchanges such as the public bond market (Marlowe, 2009).

Dahlman (1979) suggests that information search, transfer, and setup costs were all representative of the transaction costs that affect organizational or bureaucratic transactions (Baldwin, 2008; Langlois, 2006). These transaction costs would generally be well known to managers and can be factored into the cost of developing a cost accounting system or plan. Organizations and their leaders can decide whether these costs are worth incurring and design a system that maximizes the benefits of cost accounting relative to its cost. While it might be a strong assumption that organizational leaders know all of the production costs of cost accounting, it is likely that they have a fairly good idea about these costs relative to the more difficult concept of economic transactions costs.

The second perspective on transaction costs is the economic or property rights view of transaction costs that comes from Williamson (1975; 1985). This version of the theory states that the key variables of asset specificity and uncertainty arising from opportunism increase costs of transactional relationships beyond the frictional transactions costs previously

described. In the economic transactions cost version of the theory, the economic characteristics of a transaction create a risk premium that must either be paid or the parties must develop rules of governance to regulate the relationship. In public administration and management, the use of transactions cost theory shows that contracting services in local units of government is profoundly affected by these economic transactions costs (Brown and Potoski, 2003a; Brown and Potoski, 2005; Clingermayer and Feiock, 1997; Levin and Tadelis, 2010).

In economic transactions cost theory the key variable that creates the need for a risk premium and leads to transactions costs is asset specificity (Williamson 1985, p.30). Asset specificity is defined as technology, equipment, knowledge, or characteristics that must be acquired to perform an activity, provide a service, or produce a product and that has little or no value in the market outside the relationship between the supplier and consumer<sup>8</sup>. Asset specificity makes the supplier and consumer mutually dependent upon one another, which creates a “lock-in effect” that makes the parties reliant on each other’s continued cooperation and good faith (Levin and Tadelis, 2010). The tendency for asset specificity to create a lock-in effect leads those that need to develop asset specific resources to demand either a risk premium before getting into the relationship or extensive governance arrangements to manage this mutual dependency afterwards. In market-based organizations, the key asset specific resource is often the technology to create a product or to provide a service, but in the public organization the technological assets needed for service provision rarely create lock-in effects.

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<sup>8</sup> In the transactions cost literature, it is commonly assumed that the supplier and consumer are exchanging goods and services in a market situation, which is prior to the creation of governance mechanisms that create the multidivisional firm. In the case of extant public organizations, the transactions between supplier and consumer are often between the employee, who supplies human capital, and the public organization that must acquire or consume this capital.

Public organizations are unlike private organizations in that they must rely upon people much more for their productive purposes (Baumol, 1993), and asset specificity is more likely to be found within the human dimension of public service. For public organizations, essential assets might be extensive knowledge about norms, customs, and habits of behavior of specific publics or the willingness to risk one's life for a public service such as police or fire. An example of asset specificity in a public organization is put forward by Williamson when he discusses the importance of probity or loyalty in the Department of State (1999). He points out that characteristics such as probity are a part of individual asset specificity for the State Department where loyalty is necessary to insure confidentiality and continued cooperation in a difficult work environment.

When applied to the previous discussion of cost accounting system choice, transaction costs from services having asset specificity generally would reduce the optimal level of cost accounting (Figure 2.4). However, not all services have equal levels of asset specificity (See Appendix 1) and would generate different levels of transaction costs. This leads to the scenario where an organization might have multiple optima for the services that it provides. For some high asset specific and high transaction cost services, the organization may choose not to measure the cost of the service specifically. However, with lower transaction cost services, the organization may choose to measure the cost of the service much more specifically (Figure 2.5).

[Figure 2.4]

[Figure 2.5]

The second dimension of transaction costs in the property rights version of transaction cost theory is uncertainty arising from the possibility of exploitation of specific assets. This exploitation is thought to arise from one or both parties being able to act opportunistically in the relationship. Uncertainty stemming from opportunism may not necessarily arise if there is perfect trust between the contracting parties. If both parties are reasonably sure that their investment in specific assets will not be exploited by their partner, then transaction costs need not arise. Both parties can invest in specific assets and both parties can be made better off by a mutual cooperation in the production of the good or service. The opposite occurs when the parties suspect that a potential partner will not act in a completely trustworthy manner. The transaction cost arises in the latter situation when parties must extensively monitor each other's performance or do not engage in mutually beneficial cooperation. Uncertainty creates an opportunity cost for the organization to either engage in an activity or service, or it must create governance arrangements to overcome the opportunity cost (Williamson, 1985).

In the measurement of the cost of services, two competing uncertainties arise. As the organization seeks to measure the service more accurately, the organizational leader's uncertainty about the processes and costs of their departments declines. This means that organizational leaders have less transactions costs as the organization measures the costs of more services. Cost measurement of services gives organizational leaders additional information about processes and procedures that they can use to understand their organizations. To organizational leaders, transactions costs from uncertainty decrease with greater cost measurement (Figure 2.6).

In contrast, the departmental or production managers may experience significant losses of production knowledge and control (Crozier, 1964). The production managers may not want to give up their valuable information to upper level managers who can then change the processes and eliminate the significant leverage that departmental managers can accrue with time. Production managers in public organizations may fear that they will face greater uncertainty in the budget process and that they will not have sufficient resources or control of the programs for which they will be held accountable. These managers face increasing uncertainty about their processes and control of the perception of cost effectiveness of their services.

[Figure 2.6]

Especially in the presence of asset specificity, uncertainty at the departmental level will lead to transaction costs and resistance by employees. Without asset specific resources, the employees have little leverage in a bargaining relationship. They can be easily replaced by other workers found in the employment market. If the employee or the department has a specific asset that cannot be easily transferred to other employees or other departments, the production department has significant leverage in the cost measurement relationship. With high asset specific resources, the transaction costs experienced by departmental managers and employees will tend to take precedence over the lower transaction costs and benefits of cost accounting experienced by organizational leaders. Transactions costs throughout the hierarchy will be an important determinant of the use of cost accounting to measure specific departments, activities, and services (Figure 2.7).

[Figure 2.7]

The resistance to cost measurement may reveal itself through departments or services that do not have to measure the indirect costs for service provision. Cost measurement can be resisted by getting the government employer not to measure the indirect costs of products or services. This would be the best possible scenario from the perspective of the production managers and employees because the production employees would retain their production knowledge and leverage. The production employees and managers would also be able to minimize the perception of the cost of their services. Conversely, upper level managers would have much less knowledge about the processes and product costs. This situation will arise most often in the presence of high asset specificity and uncertainty about how to evaluate the output. As the transaction cost theory notes, departments and employees without asset specificity or uncertainty are unlikely to have the leverage to remove the measurement of indirect costs in organizational cost measurement.

### **Other Contextual Factors and Cost Accounting Use**

Transactions costs theory suggests that governance structure evolves to mitigate and minimize the effects of transactions costs over time (Williamson, 1975; Williamson, 1985). Several governance variables, such as leadership, slack resources and other contextual factors, may assist in overcoming transaction costs and lead to more service-level cost accounting. In the cost accounting literature on ABC, the contextual variables that lead to successful implementation are assumed to be exogenous to transactions costs in the short run. This is because in the short run, the organizational arrangements may be thought to be fixed and not

determined directly by the choice of cost accounting. However, in the long run, this assumption may not be true and so the relationship between cost accounting development and various organizational factors may be more complex.

One extensively researched factor that influences organizational innovation and cost accounting specifically is the characteristics of organizational leaders (Fernandez and Rainey, 2006; Julnes and Holzer, 2001; Moynihan and Pandey, 2005; Rogers, 2003). Leadership may be able to mitigate some of the effects of transactions costs by being able to define the initiative in a way that can be supported by the organization and that reduces uncertainty. Leaders who are predisposed to organizational change and committed to implementing the innovation are much more likely to have organizations that adopt and implement their preferred innovations. Studies of ABC note that the actions and the examples set by leaders are critical to determining the implementation of ABC in a business (Anderson, 1995; Anderson and Young, 1999; Anderson and Young, 2001; Foster and Swenson, 1997; Innes and Mitchell, 1995; Malmi, 1997; Shields, 1995).

Leaders who demonstrate commitment to the initiative can have a strong and positive effect upon the extent to which it is used. Along with the example that they set, leaders who have formal goals for cost management may be especially likely to implement and further develop cost accounting systems. If the organization resists the cost accounting of services, leaders who have committed themselves to extensive service level cost accounting are more likely to reduce the uncertainty surrounding the socially constructed value of the difficult innovation (Krackhardt, 2001). As employees look to the leader to overcome their resistance,

leaders who support the cost accounting will be more likely to present a vision to the employee that minimizes transactions costs and increases the perception of spillover benefits from the system. In summary, the leader has the chance to reduce transaction costs of cost accounting by providing solid and stable goals and expectations, and the leader may also be able to overcome the transaction costs of the initiative by showing employees how the system will be used by the organization to achieve other valuable objectives such as performance or strategic management improvement.

One leadership-related trait that is related to cost accounting is a leader's interest in using cost accounting for performance measurement. Cost accounting has been noted as being important to performance measurement because outcomes between similar programs can only be compared when there is a reasonable basis for comparison of the level of resources that have been devoted to the program or service (Ammons and Carter, 2000; Rivenbark and Carter, 2000). It does not make sense to benchmark the outcomes of a program with high levels of resources to one that has low levels of resources. Even if the programs are the same in all other respects, the low-resource program is likely to have a lower level of outputs and a lower impact than the high-resource program. Programs like the North Carolina Benchmarking program focus on developing uniform cost accounting so that managers are able to compare programs. Performance measurement is valued by organizational leaders (Ho, 2006) and is being implemented by nearly all levels of government (Berman and Wang, 2000; Melkers and Willoughby, 1998; Melkers and Willoughby, 2005).



In addition, cost accounting may provide additional information about services to supplement performance measurement activities. For some services, city managers and elected officials may have more difficulties in measuring the service output or outcome. This measurement problem is similar to the problem of service measurability uncertainty. As a result, the desire of policymakers to measure something, both at the organizational and service levels, is expected to lead to greater use of cost accounting at the service level.

Another contextual factor that influences transactions costs is organizational structure, including centralization, formalization, and hierarchical design. The more centralized organization is one that has power and decision making authority concentrated in a relatively few individuals. Formalization is the degree to which formal rules or procedures are created and followed. Hierarchy is the number of levels of an organization between decision makers and the people that produce goods or services. These factors are generally believed to inhibit the search function of the organization looking for innovations and reduce the amount of innovations considered for adoption (Rogers 2003). Organizational centrality, formalization and hierarchy tend to decrease the search and overall level of organizational innovativeness. However, these structural characteristics reverse their effect during implementation. Centralization has been found to be positively correlated with ABC implementation in private organizations (Anderson, 1995; Gosselin, 1997). Likewise, formalization and hierarchy have been shown to be a determinant of ABC implementation success (Gosselin, 1997), particularly when a chain of command is strictly followed (Geiger, 2010). These may be thought of as brute force methods of overcoming transactions costs. If a hierarchical, formal, and highly centralized organization wants to implement extensive cost accounting, it may be able to overcome

resistance by simply forcing compliance through formal rules or authoritative decisions that come down through the hierarchy. Williamson (1985) notes that the governance arrangements such as the decision to bring contracts in house or under the governance arrangements of a hierarchy may be economically rational because they reduce transactions costs. In this case, the level of organizational structure is not an either-or decision but one of relative degree. Those organizations with relatively more hierarchy, formalization, and centralization will have a relatively higher level of governance control and a lower level of transactions costs. *Ceteris paribus*, they may be more supportive of cost accounting practices in public organizations.

Slack resources is another contextual factor that can be related to the ability to overcome transaction costs and is often an important variable in the implementation of organizational innovation such as cost accounting. The ability to use more intensive forms of cost accounting and measure more indirect costs is facilitated by slack organizational resources. Slack organizational resources can overcome the transactions costs for cost accounting by providing additional incentives through higher wages and benefits for cooperation, providing opportunities for learning and training, reducing informational uncertainty, and providing information technology to aid the process. Cities that are experiencing fiscal stress have been found to need slack resources to carry out processes of retrenchment (Levine et al., 1981). Therefore, while fiscal stress may motivate searches for cost reduction strategies, some amount of slack resources may be necessary to support the full-scale use of cost accounting at the service level. For example, in their review of the amount of time that it took to develop an ABC system, Anderson and Young (2001) note that ABC training is associated positively with task significance and team cohesion, which is negatively related to development time. It seems that

additional resources, especially when used for training and development purposes would be positively related to greater cost accounting at the service level. Furthermore, many other studies of ABC implementation in the private sector note that slack resources are positively associated with successful implementations (Anderson and Young, 1999; Anderson and Young, 2001; Foster and Swenson, 1997; Innes and Mitchell, 1995; Shields, 1995). Slack resources are therefore also to be expected to have a positive impact upon service-level cost accounting.

Another contextual factor that may affect cost accounting at the service level is the size of the organization, which is also thought to be related to an organization's ability and willingness to adopt new or difficult processes. Size is often found to relate positively with an organization's ability to implement innovative practices (Rogers, 2003). Size is a relevant variable for cost accounting because larger organizations often have more processes and have greater need for understanding where they are using indirect resources. The use of ABC was found to be positively related to organization size in the accounting literature (Baird et al., 2007; Baird et al., 2004). These studies also note that smaller organizations likely will not use more advanced forms of cost accounting, such as ABC, because it is difficult and impractical for smaller organizations. More service level cost accounting is also likely to be found in larger organizations that may want to have more information on their larger number of services.

A final contextual factor that has been found to be significant in the utilization of cost accounting is the relationship of an organization to its unions. Anderson and Young (Anderson and Young, 1999; Anderson and Young, 2001) note that unions can effectively block the implementation of ABC. Having good relations with the union is critical to having a good

implementation process for intensive forms of cost accounting. As unions can influence their members and the members can influence the government, the presence of unions and management's relationship to them may be a factor that limits the use of cost accounting at the service level. Moe (2009) finds that the strength of collective bargaining contracts affects organizational outputs in the area of education. If the members of the union are threatened by cost accounting, the union will work to defeat cost accounting of their services, especially if the union is strong and if it does not have good relations with management. Management's positive relationships with unions or strong laws that limit the power of unions should be associated with more indirect cost measurement by cost accounting at the service level.

#### **Chapter Conclusion: The Theoretical Model**

Cost accounting has been proposed as an important reform to our financial management practices to address public agencies' fiscal stress. These views often only consider cost accounting as a rational response for the organization to deal with fiscal stress and related cost management activities. However, it is equally important to consider the contextual factors and transactions cost issues within an organization to deal with issues of fiscal stress. For example, transactions costs can limit the utilization of cost accounting for services that have high asset specificity. Contextual factors that influence the governance structure such as leadership, performance measurement, organizational structure, size, slack resources, and an organization's relationship with its unions will positively affect the use of cost accounting at the service level. Based on the above theoretical understanding, this study examines the impact of these factors on the use of cost accounting.

[Figure 2.8]

With the exception of transactions costs, all of the preceding variables receive support from previous studies of cost accounting use in for-profit businesses. The unexplored theoretical contribution of this theory is that transaction costs are likely to be negatively related to cost system development. Where asset specificity is high and the uncertainty surrounding the measurement of services is high, there should be an inverse relationship to cost accounting for a service. The theory suggests that the use of cost accounting at the service level is a complex organizational choice that is influenced by more than just the standard technical criteria and is subject to differences in perceptions of transactions costs throughout the hierarchy of the public organization. This observation is similar to that made by Julnes and Holzer in their study of performance measurement. They note that performance utilization is often influenced by factors beyond the typical rational-technocratic factors (Julnes and Holzer, 2001 697). If this is the case, more attention needs to be paid to non-technical factors, such as transaction costs and contextual factors, which can have long-term impacts on which services measure cost.

### Chapter 3: Cost Accounting and Cost Management in US Cities

Scholarship on cost accounting in public organizations suggests a greater need for understanding it in the governmental context, but researchers readily acknowledge that an applied understanding of government applications of cost accounting is “limited” (Rivenbark, 2000; Rivenbark, 2005) and “underdeveloped” (Lienert, 2008; Robinson, 2007). A step towards developing a knowledge of cost accounting in the governmental context is attempted in the following pages by describing the two “textbook” types of cost accounting and then expanding upon this description to describe a third type of cost accounting that comes from analysis of actual cost accounting practices.

Developments in cost accounting since ABC, both scholarly and practical, provide a new foundation upon which to understand different cost accounting systems and their managerial uses. New developments that include ABC systems that are simpler and use less information have the potential to provide accurate cost estimates of services at a much lower cost than traditional ABC. Another development is the hybrid system that combines features of traditional cost accounting and ABC, which provides visibility and managerial uses for the cost estimates of the system. These developments in cost accounting provide new bases upon which research about cost accounting systems in public organizations can proceed.

Using examples derived from city cost accounting practices, this chapter discusses the principles of the three types of cost systems, proceeding from the oldest and most basic form of traditional cost accounting to ABC and then moving to the hybrid cost accounting system

that has emerged in practice. Reports of limited ABC utilization may be caused by the fact that many cities' cost systems cannot meet the requirements of ABC. Hence, government cost accounting theories and practices must incorporate this reality and embrace the need for hybrid cost system development.

### **A Note on the Language of Cost Accounting Systems**

Since ABC was introduced over twenty years ago, there has been a troubling mixing of the language of the different cost accounting systems. Cooper and Kaplan made a conscious choice in distinguishing certain terms. To them, ABC was something wholly different and not just a more complex cost accounting system (Kaplan and Atkinson, 1998; Kaplan and Cooper, 1998). They distinguished several ABC terms from the older cost accounting counterparts. Some of these terms have been mixed over the years with the language of ABC being used in traditional cost accounting contexts, and some traditional terms have been used in ABC applications. The terms are discussed here to get some conceptual clarity and provide a definitional foundation for the remaining sections.

The definition that had the foremost distinction to early ABC developers is the difference between allocation and attribution. Both terms refer to the assignment of an overhead or indirect cost to another cost object, such as a cost center, product or service. Generally, allocation is associated with the older forms of cost accounting, and attribution is associated with ABC. The primary difference is that the older form of cost accounting is linked to more general cost drivers that are not associated with the direct consumption of indirect resources. It is therefore necessary to determine the difference between the product of an ABC

*attribution* and a more general cost accounting *allocation*. In Kaplan's advanced managerial accounting text, the text states "**Attribution** is the process of assigning a cost that is unambiguously associated with a particular cost object to that particular cost object....**Allocation** is the process of assigning a resource cost to a department or a product when a direct measure does not exist for the quantity of the resource consumed by the department or product" (Kaplan and Atkinson 1998 pgs 63 and 64). While Kaplan and Atkinson are very clear that ABC results in an attribution of cost and general cost accounting results in an allocation, in practice the separation of the two terms has not been widely recognized. It is fairly standard practice to talk about the allocation of indirect resources in an ABC model (Finkler, 2012). In this paper, the term allocation is used to mean any attribution or allocation from one cost object to another, but attribution is only used when specific and unambiguous cost drivers are used to distribute indirect resources to a cost object as in an ABC model.

Another term that is given special significance in the ABC literature is the term **indirect resources** or **indirect costs**. Generally, the terms mean the same thing and refer to resources that are used outside the direct costs of the production of a good or a service. They also generally mean the same thing as the older term of **overhead** when they refer to general support service departments such as human resources, accounting, and information technology. The literature of cost accounting has tended to shift away from the older term of overhead and embrace the indirect resources and indirect cost terms. In some ways, this is unfortunate. It is unfortunate because, when indirect costs are discussed in the public organization context, overhead is usually referring to the general support services that overhead tends to reflect. The use of indirect costs was an important development for ABC and



has some application in situations where a good or service has multiple levels of indirect resources (i.e. batch level resources and product sustaining resources), which means more than the simple one layer of overhead implies. When the indirect resource is only meant to be the general support services that feed into a department or cost center for expository purposes it will be referred to as overhead.

Finally, ABC made a distinction between the old allocation bases and the cost drivers that were supposed to link indirect costs or overhead to a product, service or cost center. The **cost driver** is an unambiguous measurement that links the product or service to the indirect cost in an ABC system. The **allocation base** is a general measurement used to spread the cost of overhead out over the cost centers in a traditional cost accounting system. As they are used here, a cost driver is any measure used to distribute indirect and overhead costs, and an allocation base is a general cost driver that is not linked unambiguously to its indirect or overhead cost. The allocation base is a rough distributional measure to allocate overhead costs and the cost driver is a measure that attempts to link overhead resources to actual consumption. Examples of cost drivers are the number of hours that a lawyer spends working on a case in the law department, the number of computers of a specific type serviced by the information technology (IT) department, and the number of journal entries processed in an accounting department. The allocation base is a quantity such as employees in a department or the size of a department's budget to allocate the cost of IT. The standard in the literature is to use the term cost driver though to mean any form of allocating mechanism. The term cost driver is used here to mean either a generic or specific cost allocation mechanism, and allocation base is used only in reference to a general allocation mechanism that one finds in the

traditional cost accounting system. When a specific and unambiguously linked cost driver is meant, it will be specified as such. Precision of language is attempted to aid distinctions between the separate cost accounting systems.

### **Traditional Cost Accounting**

In his historical analysis of cost accounting in the public sector, Rivenbark (2005) makes two very important points about the general nature of cost accounting. The first is that cost accounting is to managerial accounting what fund accounting is to government financial accounting. The activity of managerial accounting is literally defined by the cost accounting exercise. Whether the cost accounting system is ABC or a more traditional cost accounting system, the cost accounting must account for overhead costs. The other important point that the author makes for this analysis concerns a general disclaimer that needs to be made about cost accounting generally. Cost accounting has been implemented in different ways and is subject to various influences. This system has led to a non-standard application of cost accounting. Where this paper discusses traditional cost accounting, it is generally recognized that the “traditional” aspect is the standard textbook definition of a general cost accounting system and is a generalization for expository purposes. This in no way assumes that all traditional cost accounting systems are uniform. Research regarding cost accounting suggests that the government context is more varied than private organizations (Flury and Schedler,

2006) with the effect being that cost accounting systems in practice can exhibit conceptually difficult variability (Rivenbark and Carter, 2000).<sup>9</sup>

The traditional cost accounting has been likened to spreading overhead costs over the departments of an organization, like peanut butter spread over the entire organization (Kehoe et al 1995). This metaphor captures the essence of traditional cost accounting because it generally distributes the costs of overhead across the service departments of an organization. Traditional cost accounting uses allocation bases that ambiguously link products and services to overhead resource consumption. The general nature of the bases spreads the overhead costs across various departments and may not direct the costs to the parts of the organization that are using the majority of the overhead. This smoothing makes the managerial uses of traditional cost accounting information not particularly useful for management purposes that require more specific cost drivers and accurate product or service cost such as marginal analysis.

The most common uses of traditional cost accounting is to allocate the cost of overhead to the service and product providing departments for the purpose of grant and financial reporting compliance (Flury and Schedler, 2006; Rivenbark, 2005). If the overhead costs were to be left out, this would significantly understate the true cost of providing that service and

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<sup>9</sup> This section on traditional cost accounting is a general description of the characteristics of cost accounting. Interested readers who would like an applied description or examples of single stepdown, double stepdown methods, and even some simultaneous applications are referred to the Nashville-Davidson *Cost Accounting Manual for Metro Government*: [http://www.nashville.gov/finance/omb/cost\\_accounting.asp](http://www.nashville.gov/finance/omb/cost_accounting.asp). A standard textbook description in a government context can be found in Steven Finkler's *Financial management for public, health, and not-for-profit organizations*

grant funded activities may not be completely reimbursed<sup>10</sup>. When overhead is not allowed by granting agencies, the local government must support the overhead costs from its own resources. When grants do allow for the provision of the capture of overhead and indirect costs, governments that do not allocate overhead costs to the grants give up resources that could be used to increase the welfare of local citizens<sup>11</sup>. Traditional cost accounting systems could also be used to include some measure of overhead cost for pricing services that would be provided by a user charge. However, this method of pricing goods and services was inaccurate as has been pointed out by proponents of ABC.

Traditional ways of allocating indirect costs in traditional cost accounting are to use either the direct or step-down method. The other traditional cost accounting method of allocating these secondary expenses is through a reciprocal costing or linear algebra methodology. Reciprocal allocation is not widely discussed in public financial management.<sup>12</sup> At length the subject of reciprocal allocation is not especially useful if the allocation base is not specific enough to enhance the accuracy of the method. As one of the standard texts in public financial management notes, “Although the allocation that results from this method (reciprocal costing) is more accurate, it is more complicated to understand and implement. Step-down allocation is generally considered to be sufficient, despite its inherent limitations” (Finkler 2003).

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<sup>10</sup> This assumes that the grant allows the allocation of indirect or overhead costs. Not all grants allow overhead to be recovered but many do.

<sup>11</sup> Guidelines for grants to local government from the federal government are found in 2 CFR Part 225, formerly OMB A-87.

<sup>12</sup> It is unfortunate that reciprocal costing is not more broadly taught because the computing resources necessary for achieving these more accurate allocations is readily available and simple enough for students to learn. However, the benefit to teaching this more advanced method may be irrelevant due to the allocation schemes and the underdevelopment of cost accounting systems (Rivenbark 2005). The ready availability of spreadsheet software that can do reciprocal cost allocations may also not be known.

An example of the traditional cost accounting system is given in the hypothetical example of the City of Frugal (Figure 3.1). The budget for the departments of Frugal is presented first. The first thing to notice with the traditional cost accounting plan is the allocation bases that will be used to distribute the costs to the departments. The allocation bases are general such as the use of Full Time Equivalent Employees (FTE) or department's expenditures from the budget to distribute the cost. As was noted previously, the effect of these general cost drivers is to spread the cost of the overhead departments between the receiving departments with little recognition of the actual resources used. In the traditional cost accounting system, the bases are not linked to actual resource usage and there is little ability to control overhead costs.

In the traditional cost accounting system it may *not* be necessary to drive the cost down to products and services as is done with ABC<sup>13</sup>. The receiving cost centers are departments or general categories of spending such as a grant service. Not only are the receiving departments general but so are the overhead cost pools. In this example, there are two cost pools that are distributed to two departments. The Administration and Council cost center obviously has multiple activities but the cost of this cost center is distributed in an equivalent way based upon the number of employees. The Information Technology (IT) department also is a general cost

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<sup>13</sup> It can be argued that traditional cost accounting systems can be used to help develop a more accurate estimate of the average cost of services. For example, the cost developed by the traditional cost accounting system can be divided by the total output of the department to derive an average cost for goods and services. In contrast, ABC uses specific drivers and a hierarchy of costs to approximate the marginal cost of services for management purposes that need more accurate service costs than those averaged across service types. However, averages of service costs are not the same as the more accurate estimates of individual service costs as explained in the next section.

pool with a general driver. Again, the effect is to spread out costs by allocating them using general cost bases.

The costs of the administrative departments are allocated using the double step-down method. It first takes the cost of the cost pool and allocates those costs on the basis of the driver to both overhead and service departments.<sup>14</sup> In the second allocation, the allocated costs from the first step down that were distributed to other overhead departments are then allocated based upon the remaining drivers to the service departments. The final cost of service departments is shown after the allocation for IT where the Production Department 1 (PD1) accounts for \$329,106 of the \$550,000 cost and the Production Department 2 (PD2) accounts for \$220,894 of the \$550,000. The costs of the overhead departments have been spread across the service departments in a way that roughly corresponds with each department's share of the budget relative to the other service department. While the traditional cost accounting system can distribute the costs to the service department, these costs may not reflect actual the consumption of overhead resources.

[Figure 3.1]

### **Activity Based Costing**

Traditional cost accounting benefits from over a century of research and development in both municipal and federal government (Kraines, 1970; Rivenbark, 2005; Rubin, 1993). The relatively more recent activity based costing (ABC) was proposed by Cooper and Kaplan (Cooper

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<sup>14</sup> In the figure below, I have noted the negative allocation for purposes of clarity. The allocation to receiving departments cancels out a cost in an overhead department. Also, I have noted the total cost that has been distributed to each level of service. In a larger example, all of the allocations would be combined at the end but in the case of this simple example it shows how costs accumulate as each overhead department allocates its costs to service departments.

and Kaplan, 1988; Cooper and Kaplan, 1992; Kaplan, 1988; Kaplan and Cooper, 1998) and comes from the critique that traditional cost systems were failing to provide the meaningful information needed for businesses to compete in a highly competitive, global environment (Johnson and Kaplan, 1987). This idea was applied to governments that also had their own pressures to be more efficient in the 1990s (Brimson, Antos and Collins, 1999; Kehoe, 1995; Weiss, 1997). Because of its more recent prominence, somewhat more is known about actual applications of ABC in modern governments than traditional cost accounting, but the knowledge and the applications of ABC have not led to a standard ABC development in government. Due to this lack of discussion in the literature on a standard process for local governments to develop an ABC system, the general four step process of ABC (Gosselin, 1997) is first discussed and then the key elements of the ABC system are differentiated for contrast with traditional cost accounting.

The first step to any ABC system is “to identify the activities being performed by the organization’s support resources” (Kaplan and Atkinson 1997, pg 97). Within the ABC framework, the cost center is no longer the central focus of the analysis, and the central focus becomes the support resources that may come from either overhead cost centers or from the indirect costs within the service centers to provide a good or service. This distinction is important because a service center may provide many services and have many resources. In the ABC framework, the goal is to align the resources consumed to the production of products and services. This necessitates that the absolute first step be to track the activities of support and service centers, which will eventually be used to determine all of the costs that go into each and every activity.

In the second stage of the ABC system, managers or accountants trace the costs of indirect costs to products or services by determining the “activity cost driver” or “cost driver”. The cost driver is some quantifiable measure that can connect indirect costs to individual products or services through a “cause and effect relationship”. ABC provides the mechanism to establish a causal relationship between common costs that must be ignored by traditional cost systems because managers are not provided the information they need to understand and control their usage of common costs (Kaplan and Atkinson 1997, 99). Research in actual government settings provides some guide to the type of driver required (Geiger, 1999), but in general the driver should be specific to establish the cause and effect relationship between indirect resources actually used and resources accounted for in the cost attribution.

In the third stage of ABC, everything is put together to determine the full cost of doing an activity such as production or providing a service. The ABC designer links the indirect costs to the cost drivers identified and the direct costs of service to determine the actual cost of production or service. The key is that every cost is logically connected to the output. The estimate obtained is usually much more accurate because it is not based upon arbitrary allocation or overly generalized bases. It is in this stage that the true costs of activities are revealed. The purpose of ABC is to ultimately give managers the information that they need to determine which products, services, customers and processes add value to the mission of the organization. Where there are losses of value the product or service should be redesigned or eliminated to increase the value of the organization. In the case of one non-profit healthcare clinic, new information from ABC about the cost of services revealed that one of its dialysis treatments that the clinic thought was profitable was actually being subsidized by another



dialysis treatment that was previously thought to be unprofitable (Kaplan and Atkinson, 1998). Once the true costs of services were known it was easy to determine that, where it was appropriate, the customers that could receive the second type of treatment should receive it. With their old cost accounting system, the managers had been funneling their patients into an overly costly and unprofitable service. In this case, the customer and the clinic can be made better off by the increased awareness of the true cost of services.

The fourth and final stage is the active management of an organization based upon the information obtained from an ABC process. This is also known as Activity Based Cost Management or just Activity Based Management (ABM). ABM generally requires some sort of process reengineering, total quality management, cost-of-quality analysis, continuous improvement, process modeling and simulation, value analysis, benchmarking and others (Kehoe et al 1995). In any case, information being used extensively in the management of an organization pushes an organization beyond activity based cost accounting and into ABM. This is described more fully in the section on cost management.

While the details of ABC such as cost drivers, attribution, and indirect costs are obviously different from traditional cost accounting, the major difference is the purpose of the system. Activity based costing provides government managers and controllers a cost accounting technique that is specific enough to track the indirect resource consumption of individual products and services. This focus on individual products and services and the highly specific cost drivers that it requires seems to be the biggest difference between traditional cost accounting and ABC. For purposes such as grant reimbursement, traditional cost accounting

may give an acceptable estimate of cost, but it probably does not give extremely accurate information for individual products or services. The original purpose of ABC was to provide managers with the information that they needed to be more profitable and improve their processes (Kaplan and Cooper, 1998). While financial profitability is not a concern for government exactly as it is with business (Flury and Schedler, 2006; Mullins and Zorn, 1999), the use of more specific cost drivers to increase knowledge of processes, drive organizational learning, and increase efficiency is a concern for government managers (Brimson, Antos and Collins, 1999; Kehoe, 1995; Weiss, 1997), especially in times of fiscal scarcity (Geiger, 2010). These arguments for the utility of ABC often contrast with its extremely low levels of usage in public organizations like cities (Kennett, Durler and Downs, 2007).

The hypothetical example of Frugal can be used to show how an ABC system specifically attributes the costs of indirect resources to develop a more accurate cost for products and services. The following example starts with the same small community with two overhead departments: Administration and Council, and the IT department (Figure 3.2). After doing an activity analysis, it was found that the Administration and Council cost pool was doing two distinct activities. The IT department was found to be doing primarily one activity, which was servicing the computers of the departments. For brevity, the example assumes that the service departments, PD1 and PD2, each do one activity. In a real example, departments do multiple activities and using ABC the city could trace the cost down to the activity level in these departments using the method described.

Once the activity analysis was completed, the government then figured out cost drivers that were logically linked to the indirect resource usage. The first indirect resource was general administration and it was found that the general nature of the administrative functions performed could only be based upon the time the administrative officers of the city spent with the activities of the Council, IT, and the service departments. The Administration department began tracking its time in the payroll system as a realistic way of basing the costs of administration. Of the proportion of the Council's time to be allocated, it was thought fair to distribute those costs based upon the number of agenda items that the council has to review. Also, the cost driver for IT was found to be the number of computers in each department as that is the primary activity with which the department is concerned.

An important difference between the ABC system of cost accounting and the traditional cost accounting system is the recognition that some costs may not be appropriate to distribute to the lower levels of service providing departments, because some of those costs are necessary to sustain the organization. In this case, only half of the Council's cost is attributed to the service departments because only half of the Council's time has been found to be related to actual departmental issues. A large portion of the time is related to general organizational maintenance activities such as interacting with citizens. This concept of a hierarchy of costs is applicable at the departmental level which is being developed here. It is also applicable at levels within the department when specific activities there have costs that only apply to the batch and product sustaining level.

Once the activities of the indirect resource departments are attributed with clear and specific drivers to the activities performed by the organization, the indirect resources can be attributed to the products and services of the organization. As in the traditional cost accounting example, the double step-down methodology is used. In this example, Administration has to be distributed before the Council and then the IT department. After all of the service departments have attributed their indirect resources to the service departments, it is apparent that PD2 consumes much more indirect resources than PD1. After the allocations from the three overhead departments, the total direct and indirect cost of PD2 is almost as much as the cost of PD1 even though the direct cost of PD1 is \$80,000 greater than the cost of PD2 according to the budget. This example shows how ABC develops a generally better estimate of actual resources consumed in production even over the traditional cost accounting system. The final cost also shows that some overhead resource costs such as Council expense are more general organization related than service related. Distributing these costs fully, or a full attribution, as is done with the traditional cost accounting system, overstates the true cost of services.

[Figure 3.2]

It is increasingly realized that the original ABC as developed by Cooper and Kaplan was much too ambitious for many real world applications. In one of the most extensive studies of ABC implementation, Anderson and Young (Anderson, 1995; Anderson and Young, 1999; 2001) note that auto manufacturers GM and Chrysler were some of the first adopters and promoters of ABC, but most divisions of these companies had abandoned ABC by the early 2000s, largely

due to data requirements and the difficulty of maintaining the systems. A survey of municipalities over 100,000 population established a *high* estimate of the number of cities using ABC at less than 17% (Kennett, Durler and Downs, 2007).

Accurate product and service costs developed by ABC remain important for management, but data requirements for these models are extensive. In a 2004 article in the Harvard Business Review, Robert Kaplan and Steven Anderson wrote about the difficulties that companies had implementing traditional ABC or what is described in the literature as Push ABC. They suggested a less intensive form of ABC that they called “Time-driven ABC” and they followed up the 2004 article with a 2007 book on the subject. Time-driven ABC or Pull ABC, as it is more generally called by the other software and consulting firms that help develop ABC systems, works off of the principle of estimating the amount of time that it takes to do a process through either historical analysis or general management understanding, and then multiplies by the number of activities that are expected in order to make a product or the number of products that a department will produce.

This method “pulls” the numbers from the accounting system rather than “push” the numbers onto the accounting system. The numbers that are developed from a pull ABC will not align perfectly with the actual costs of an organization because the pull ABC estimates the “practical capacity” as opposed to the “theoretical capacity” of both labor and capital. These authors argue that push ABC tends to overestimate the cost of products because the products are being charged for the full cost of the theoretical capacity as opposed to the actual capacity (Kaplan and Anderson, 2003; Kaplan and Anderson, 2007).

Kaplan and Anderson give several examples of companies that have used pull ABC for product costing and even efficiency enhancing purposes. A quick review of Anderson's company website reveals that they have some public and governmental clients including Jackson State University and the U.S. Coast Guard. Research on these public organizations' experiences with pull ABC compared with government and non-profit organizations that have utilized push ABC may be warranted in the future. Although there may be some differences between the implementation of these different types of ABC, the state of the research on the diffusion of ABC in the public sector warrants more general work on the implementation of these systems prior to distinctions being drawn about the relative merits of one over the other for public organizations. Although pull ABC may reduce some of the data requirements, both the private sector ABC implementation literature (See Anderson and Young, 1999 for an introduction to this literature) and more recent international literature on ABC in government settings suggests that pull ABC may not address all of the issues in a governmental setting for an easy implementation (Baird, 2007; Flury and Schedler, 2006; Geiger, 2010). For example, the Jackson State implementation showed that some senior leaders lacked interest in cost accounting and that information needs of the system were still greater than what could be easily met by existing information systems that were fragmented and incomplete (Kaplan and Anderson, 2007)

### **Hybrid Cost Systems: Between Traditional Cost Accounting and ABC**

The preceding analysis of traditional cost accounting systems and ABC systems is intended to contrast the two ends of the spectrum that are noted in the literature. There is in

fact an intermediate position (and perhaps multiple positions) between the two poles. This system represents a hybrid between the traditional cost system and the ABC system and is conceptually similar to the “hybrid system” of the accounting literature (Horngren, Datar and Rajan, 2011). The “hybrid” system contains a mixture of both traditional and activity based cost elements.

The example from the Horngren text of a hybrid cost system is specialized shoe manufacturing. These specialized shoe systems that can be found over the internet and at specialized shops for making custom brand-name shoes have both activity-specific cost drivers, such as the level of customization, and more general cost drivers, such as the general cost of the base shoe. While an ABC system would map the activities for each individual shoe and give it a price, the level of individual customization makes this nearly impossible. Instead, the shoe manufacturer relies upon a general cost and then builds upon it using specific cost drivers such as separate colors, materials, or orthotic support. The hybrid cost system balances the cost of the system with the benefit by providing a mix of general and specific cost drivers.

The same mentality of balance between the cost and benefit of the system can be readily seen when one identifies actual cost plans in local governments. As part of the subsequent research, I requested the cost plans of all cities over 100,000 population and the plans analyzed all have a mix of specific and generic cost drivers. Representative examples of these plans can be found on the City of Houston<sup>15</sup> and the City-County website of Nashville-

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<sup>15</sup> <http://www.houstontx.gov/finance/cost.html>

Davidson County<sup>16</sup>. These plans are developed under the pressures that governments face to be efficient even with the cost of the cost plan.

The hybrid cost system exhibits varied or mixed levels on the critical dimensions of difference between traditional and activity based cost systems. For example, the hybrid system has a mix of general and specific cost drivers. While the traditional cost system uses basic cost drivers to roughly allocate the indirect resources down to service-providing departments, the hybrid system uses some generic cost drivers and specific drivers. For example, the City of Houston 2010 Full Cost Plan shows that cost drivers for the human resource department included full time employees, classified full time employees, selections, and number of employees trained (Maximus, 2009). Half of the human resources cost drivers are specific but this percentage of general and specific drivers can vary widely from department to department. Therefore, some of the departmental services are measured directly, such as hiring employees, and other services, such as counseling employees, are not addressed. This allows the hybrid system to have some claim to an unambiguous link to indirect resource consumption but not completely or for all services.

Hybrid cost systems may also not have a hierarchy of costs or may not distribute the indirect resources of activities all the way down to products or services. The example (Figure 3.3) below is an illustration of the Frugal case using a hybrid system. First, it has a mix of general and specific cost drivers. Rather than keeping track of all the time spent on departmental business, the administration felt that it would be more cost effective to simply use the number of full-time equivalents (FTEs) in each department as a general cost base.

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<sup>16</sup> [http://www.nashville.gov/finance/omb/cost\\_accounting.asp](http://www.nashville.gov/finance/omb/cost_accounting.asp)



Second, the hybrid cost accounting system does not have a hierarchy of costs for the council. All of the cost of the council is distributed down to the service departments. Next, the indirect or overhead resources distributed by the hybrid system may be sent to either products and services or general departments. Finally, the costs of indirect resources are not spread evenly over the organization like the traditional cost accounting system but they also are not as unambiguous as the ABC system. Generally, the hybrid system with mostly specific cost drivers develops a better estimate than traditional cost systems but not quite as specific as ABC.

[Figure 3.3]

Having specific drivers not only increases the accuracy of the cost information about true cost of service but it also increases the value of the information. Because it may vary from time period to time period, it facilitates organizational learning (Geiger, 2010). Organizational leaders can use periodic hybrid cost data to do variance analysis of indirect resource consumption, streamline processes, and make better product or service allocation decisions. However, if it is distributed to a general cost pool or is using a generic allocation base, the usefulness of the cost information may be more limited. The use of generic cost drivers does not allow extensive management of indirect resource consumption because the generic cost driver is not linked unambiguously to the indirect resource and often does not change enough to meaningfully be used to guide decisions about resource usage.

### **Comparison of the Three Systems**

The table below describes key features of the three types of systems discussed (Table 3.1). The key dimensions focus the point of discussion on the reasons for the cost system. Cost

and benefit are standard considerations for any organization developing a cost system. In the public sector, the “truthfulness” (Geiger, 2001) or the credibility of the drivers, the system, and the allocations also have to be taken into consideration. The managerial use of the information is also a relevant issue in public organizations where the full absorption of all costs can be the preferred system while other systems that may have a more managerial use might have a hierarchy of indirect costs such as the ABC system. The variability of purpose calls attention to the fact that cost systems cannot be developed without some idea of their future use in mind.

[Table 3.1]

An expanded comparison of the cost system attributes is provided below (Table 3.2). In this table, the two types of ABC have been distinguished from one another because there are fundamental differences between them. The key attributes of ABC remain the same for both types of ABC. To summarize the expanded cost system table, the traditional cost accounting is the simplest and is suitable for a rough estimate of costs and some external reporting requirements. The ABC systems are more complex but the Pull ABC minimizes the information requirements from the ABC system. Both ABC systems are well designed for giving good product or service costs, although the cost estimates are slightly different (for theoretical discussion see Kaplan and Anderson, 2003). The hybrid cost accounting system is an intermediate step between the standard cost accounting model and the full ABC models. It may provide visibility to costs, and it provides avenues for some cost management.

[Table 3.2]

### **Cost Management: Using Cost Accounting and Management for More than Reporting**

As has been previously discussed, the cost system that an organization develops should be based upon the needs and purposes of the organization. However, according to researchers and practitioners familiar with cost accounting, cost systems should be developed with the purpose of the system in mind from the beginning (Flury and Schedler, 2006; Geiger, 2010). This is because there is a tendency by some to view cost accounting as a measure first and then ask questions about its use and purpose later. Research in both private and public contexts recommends strongly against this type of practice (Flury and Schedler, 2006; Kaplan and Atkinson, 1998).

While there is some discussion of the usefulness for cost accounting information in contexts outside of management such as budgeting (Premchand, 2006), the primary purpose of cost accounting is to inform management decisions on the cost of products and services (Horngren, Datar and Rajan, 2011). As Rivenbark notes, the traditional cost accounting system developed over time in public organizations has served the purposes of compliance and reporting primarily. Only recently cost accounting is used for performance management and benchmarking purposes in the public sector (Rivenbark, 2005; Rivenbark and Carter, 2000).

Although traditional cost accounting can be used to generate the average costs of services, its primary purpose is to mandate compliance and public reporting. This includes compliance with the grantee requirements in the 2 CFR Part 225 for overhead (formerly OMB A-87) and compliance with financial reporting requirements (Rivenbark, 2005). Governments may choose not to use cost accounting to document overhead, but they will have to give up federal grant money and opportunities to manage their indirect resource consumption.

Unfortunately, Rivenbark (2005) notes that cost accounting has never caught on with US local governments. The managerial use of cost accounting information is quite far removed from the everyday practices of many local governments, and many of them simply have no cost accounting systems.

ABC is conceptually older than hybrid systems. Hence, it has more documented usage. It is also the more accurate and elaborated system compared with traditional cost accounting and can provide more avenues for managerial use. The activity analysis itself in ABC is highly useful for management, which provides managers a detailed list of all of the things that the organization is doing. There are two primary uses of the activity information, which could be described as the orthodox use and the extended use of the data.

The orthodox use that Cooper and Kaplan had for the ABC system was that it be used to guide complex product and service mix choices. The more accurate cost information would provide businesses with the choice of which product to sell. In the government context, where discretionary choice of service provision by the management is not always an option, the choice often comes down to contracting-out or in-house production. Services that do not account for any indirect cost almost always favor the in-house provision because the true costs of the services are not observed. Likewise, traditional cost accounting can either over- or underestimate costs. For example, in Indianapolis, ABC was used as a way to evaluate the possibility of contracting services such as road maintenance (Brimson, Antos and Collins, 1999), but this purpose has also been importantly criticized as being an incomplete account of the cost because cost accounting systems do not account for externalities (Mullins and Zorn, 1999). This

criticism is correct insofar as service level differences that produce externalities should be accounted for to produce the economically rational service choice decision. However, there are many instances where the choice is one between similar services that produce similar externalities. Thus, the cost accounting decision would be appropriate because the externalities are equivalent. As the case study of the public health clinic in Kaplan and Atkinson (1998) notes, the cost system could obfuscate the least costly of two equivalent services such as in-home versus hospital dialysis treatments. In this case study, the treatment options produced equivalent results but the method of cost accounting obscured the fact that the apparently more profitable treatment was actually losing money and being subsidized by the other service. This example shows that cost accounting can be useful when choosing between equivalent forms of service provision for a public organization.

The more general management use of ABC information is one of continuous improvement. The ABC system is as specific as is practical and can thus be used for specific improvements. Assuming that the information from the system is timely (and this may be a significant assumption as many have noted ie. Anderson and Young, 2001; Geiger, 2010; Kaplan and Anderson, 2007), the ABC system can be used to guide processes such as six sigma, lean improvements, Kaizen costing, and benchmarking (Brimson, Antos and Collins, 1999; Kehoe, 1995). The purpose of the systems is for management to actively try to reduce the costs of products and services. The activity-based nature of ABC cost data allows the organization to

drill down into those costs and work on minimizing cost or improving quality with equivalent cost for individual products and services<sup>17</sup>.

The hybrid system also has some ability to assist in the management of indirect costs. Hybrid systems that have more specific cost drivers than general cost drivers encourage the analysis and management of indirect costs. The hybrid system provides a cost estimate that is somewhere between the traditional cost system and the ABC system. Therefore, it can provide a more meaningful estimate to guide alternative service provision decisions but may not be as accurate as ABC.

Where the ABC system encourages continuous improvement at the product or service level, the hybrid system can only go down to the level upon which there are meaningful cause and effect cost drivers. For example, if police department overhead is allocated to a patrol division with a specific cost driver, then the improvement of patrol divisions is possible. If the cost of overhead is distributed to the entire police department with specific cost drivers, then the police department's use of overhead is the meaningful unit of management. If a more general cost driver such as the number of employees is used, it is probably not practical to manage the overhead resource consumption. Although the indirect cost may not be drilled down to a service or product, this does not mean that it cannot be used for management purposes. As Geiger documents in the case of the Army, managers can meaningfully be put in charge of their overhead cost and asked to reduce them, which produces organizational learning (Geiger, 2000; Geiger, 2010). By using processes such as variance analysis to analyze

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<sup>17</sup> A third option for uses of cost system information is its use in budgeting (Premchand 2006). In spite of the arguments for its merits, this remains a difficult proposition and is probably not within the realm of possibility given the state of knowledge on cost systems.

indirect resource usage, utilizing cost information to inform management and policy, and focusing on output-based management reforms, an organization can more effectively manage for efficiency enhancing purposes (Geiger, 2010). The key to Geiger's arguments for cost management seems to be creating a context in which the leaders of departments are encouraged and empowered to manage their costs using cost information that is meaningfully tied to indirect resource consumption.

### **Chapter Conclusion: Possibilities and Limitations of Different Types of Cost Accounting**

The developments of cost accounting since the development of ABC over 20 years ago have provided some new avenues for cost system development in public organizations. This synthesis of the development that has happened in cost systems hopefully generates renewed interest in other forms of cost accounting. It also points to the need to understand that cost accounting systems do not develop in public organizations to be the most intense or best form of cost accounting and resemble ABC systems exclusively. Other forms of cost accounting, such as the hybrid cost accounting system, have developed which have a mix of general and specific drivers that measure the indirect costs for some public services and not others. The following sections reveal that the theoretical elements of fiscal stress, transaction costs, and contextual factors do influence the development of the hybrid cost accounting systems that are observed in public organizations.

#### Chapter 4: The Missing Cost in Cost Accounting: A Qualitative Case Analysis

The first chapter showed that fiscal stress theoretically promoted cost accounting in public organizations and the second chapter showed that transaction costs theoretically limit the utilization of intense forms of cost accounting in government. It was discussed in the third chapter that one of the most involved forms of cost accounting is Activity Based Costing (ABC). If the limits of transactions costs are to be observed for cost accounting, it would be most apparent in an ABC implementation as the government adjusts to a new and intensive form of cost accounting.

The most recent estimate of the percentage of local governments using ABC is less than 17% for large cities (Kennett, Durler and Downs, 2007). This small number suggests that government implementations of ABC are relatively rare events and are likely even rarer in smaller units of government (Brown et al., 1999). In 2011 an opportunity to study an ABC implementation presented itself as a small, city government sought advice from researchers at the University of Kansas on developing an ABC system. The city was in the early stages of ABC development and had just completed the activity analysis. The ABC leadership had already experienced some setback as the police department had lobbied the city council to exempt them from the initiative. This suggested that transactions costs may be influencing ABC implementation because policing is often regarded as one of the highest transactions cost services (Brown and Potoski, 2003a; Levin and Tadelis, 2010).



One of the few case studies in the academic literature of an ABC implementation in a local government determined that ABC was particularly hard for a small government (Brown, Myring and Gard, 1999) and other research shows that cost accounting is particularly well developed for the production type activities in government (Geiger, 2010; Geiger and Ittner, 1996); so, this case study represents an unlikely but interesting case of a small government implementing ABC without the need for the price setting necessary for enterprise or production activities. The analysis of unlikely cases is ideal for exploratory theory (George and Bennett, 2005) and examining the effects of unexplored factors such as transactions costs in the implementation of public financial management innovations.

### **Research Expectations for the Small Government Case**

The expectations for the case study come from the theoretical model that was discussed in Chapter 2 (Figure 2.8). The case study allows the probing of the relationships between cost accounting development and the issues of fiscal stress, transaction costs, and contextual factors. While the results are limited to the experience of a single case, the case allows the full model to be analyzed.

The first expectation is that the local government will be utilizing more cost accounting because of real or perceived fiscal stress. This relationship may be moderated by the availability of slack resources to implement an advanced form of cost accounting such as ABC. Slack resources may also have the ability to reduce transaction costs as the resistance of dissenters can be lessened through side payments. The effect of available resources is likely to

be one of the most important reasons that the government will engage in cost accounting reforms.

The main theoretical issue that this research is seeking to address is the issue of transaction costs in the implementation. It is expected that both mundane (Langlois, 2006) and economic transaction costs (Williamson, 1985) will act to limit the development of cost accounting. Specifically, asset specificity and uncertainty will act to limit the development of cost accounting.

Finally, small government will have unique contextual factors that will influence the development of cost accounting. Leadership will likely encourage ABC development and use. Performance measurement and performance management are likely to influence the case study government to utilize ABC to a greater extent. A more hierarchical, centralized, and formal organizational structure should allow for a greater development of ABC. The case study does not have a labor union and so the absence of unions will likely encourage ABC development but this may not be identified in the case because participants may not be aware of the effect of unions on cost system development. Finally, the organization is small, which research tells us will most likely limit the development of ABC in the organization. However, the small size of the organization allows a more precise analysis of the other variables that influence the ABC development.

### **Study Design, Data, and Methods**

The data for this study is collected through semi-structured interviews with those persons in the organization that were familiar with the details of ABC. The questions were structured by

existing research and relevant theory to approximate the idea of “structured, focused comparison” (George and Bennett, 2005). The interviews proceeded by following the questions in order as listed in the Appendix<sup>18</sup>. While the question format was structured in advance, the interviewer often asked follow-up questions that seemed relevant to the interview participants’ experiences. This semi-structured interview format allows for broad-based questions that permit interview participants to give the full range of their relevant experiences (Rubin and Rubin, 2005). The format also allows for the inductive analysis of relevant variables or issues that are not reported in the traditional literature. Because there exists only a limited literature on this topic, a semi-structured format allows issues to emerge from the participants’ responses (Geertz, 1973).

The interview candidates were drawn from all of the people in the organization that developed the ABC system or who are responsible for major departments that are affected by it. This format of interviewing relevant managers and developers is similar to previous studies of private sector ABC implementation (Anderson, 1995; Anderson and Young, 1999). In total there were eight interviews, half of which were with the heads of the major departments – police, the clerk’s office, finance, and public works. The city does not have utilities or a fire department. The other half of the eight interviews were with the City Administrator and the Assistant City Administrator, as well as with two analysts that were part of the ABC system’s development. The small sample size may necessitate caution in the interpretation of results. Interview participants are likely not representative of all employees, but they were purposively

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<sup>18</sup> There was one exception in which one of the analysts was much more interested in talking about the mechanics of the ABC implementation and so the questions for this one analyst did not follow directly in order. This interview is not heavily relied upon in the analysis.

chosen because they have the relevant experience implementing ABC. All of the interviews took place in September of 2011.

[Table 4.1]

### **Case Background**

The local government in this case study is a small suburban city with a population of 21,000 in the Kansas City metropolitan area with 130 employees. In terms of personnel, the largest department is police with 61 employees, but in terms of expense the largest department is public works, with occupied just over half of the 2010 budgeted expenses (Santa Maria, 2011). The community is built out and the government concentrates on redevelopment and citizen amenities.

The City is led by a 12-member City Council and a Mayor elected at large. The Council Members are elected by wards and each ward has two members. The Mayor and City Council appoint a City Administrator that reports to them. The department managers report to the City Manager according to city ordinance. The reporting arrangement between the department managers and City Administrator is new and changed with the current administrator just before the local government began implementing ABC.

According to the organizational leaders that were interviewed, the City consists of three departmental “silos”: the Police Department, Administration, and Public Works (Figure 4.1). The Police Department includes the activities of patrol, investigations, special investigations, and municipal court. The Administration Department includes smaller units of Finance, City

Clerk's Office, and the City Administrator's Office that handles codes enforcement. Generally, the activities of Administration and its sub-departments are diverse, including community development, code enforcement, business licensing, administering recreation programs, human resource management and council support. Public Works includes the activities of street repair and maintenance, parks, buildings, and fleet maintenance.

[Figure 4.1]

The City Administrator formed the ABC development team shortly after his arrival in 2009. In 2010 the ABC development team completed an analysis of all the activities in the City. The Administrator and ABC development team then tried to get all employees to track their time through a new payroll management system. The Police Department resisted this requirement and Council agreed that they did not have to track their activities on a bi-weekly basis as the Administration Department was doing. Instead, the Police developed estimates of the amount of time that they were spending on all of their activities. When the ABC initiative began, Public Works was already collecting data on their activities through their existing work management system. Hence, they continued this effort and incorporated that into the ABC system. When the research was conducted, the ABC system was in the second stage of development, which tried to tie cost drivers to activities.

The local government slowly developed the ABC system to minimize costs and refine the system over time. For example, they began developing activities in anticipation of new payroll management software. Using off-the-shelf payroll management software to track activities minimizes the cost of developing an additional system to track activities. This time information

is fed into Excel spreadsheets to develop estimates of costs. The activity tracking payroll software had been online since January 2010. As a result, the organization had very good employee time data for the Administration Department for a full fiscal year. Using the data from 2010, the ABC development team refined their job codes and began tracking purchases with the same codes (Figure 4.2). The City's priorities at that time for the system were to tie indirect costs to service level activities to create cost models. They also hoped to complete the crosswalking of the public works activity database to the Administration's system. With this completed, they would have accurate activity cost models for two thirds of the City and hope to tie the Police Department into the system at some point in the future.

### **The Relationship between Fiscal Stress, Slack Resource, and ABC Implementation**

The first question of interest was why this local government was interested in developing the ABC system. The interviews indicated that practical considerations of fiscal stress supported the organization's decision to implement ABC. However, fiscal stress was not seen as a legitimate reason for ABC by *all* interviewees. While most interview participants saw the initiative as a positive response to fiscal stress, there were a minority of interviewees that suggested it would cause problems.

In the fiscal climate in which many cities were being asked to do more with less, fiscal stress seemed to provide a window for the organizational leaders to implement ABC. Department managers and analysts often noted that the organization was trying to get "a handle on" or "deal with" fiscal stress or more difficult budgets. For others, the fiscal stress was more an anticipation of what could possibly come for the community. One of the

organizational leaders said, “It is a way of alleviating fiscal aspects before they happen.”<sup>19</sup>

Other statements implied fiscal stress in the budget process such as this quote from one of the organizational leaders:

“[I]f we translate the budget into services and service levels, we can have a structured dialogue about the budget. Instead of the just the randomness of hey we need to cut \$400,000. Where are we going to cut? Do you like the golf tournament? ...what about tree trimming or the street project?”

However, some department managers noted the use of ABC for dealing with fiscal stress was illegitimate or counterproductive. One manager said, “... we are all going after the same pool of money. ... You can only cut so much and that is where we are at. We are at very little breathing room for programs and we are scratching now.” The sentiment reflects that more resources are required and that no amount of cutting is going to address the needs of the department.

These contrasting perspectives on fiscal stress, as both a reason for and against ABC, show that fiscal stress is not a common motivator for ABC across all units or people in the organization. Some department directors tended to reflect skepticism about the usefulness of ABC for their departments. Fiscal stress can be a major reason that legitimates the use of ABC and cost management systems in local government. However, it can also generate organizational resistance as people deal with the uncertainty of its use. Department directors reflected that their employees might be hurt by the tool if it was used to cut functions and staff.

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<sup>19</sup> Throughout the chapter I use unattributed quotes because the interview participants spoke on conditions of not using their name or title. Where it is appropriate, the words in parenthesis are added to clarify the context of what they were talking about or to retain the confidentiality of their position.

Therefore, fiscal stress was both a motivator as well as a source of organizational resistance during the implementation of the system.

While future fiscal stress motivated the development of ABC, the organization had additional slack resources in the short term to promote its utilization. The organizational leaders made it a priority to tie the ABC initiative to a broader need for organizational reform and renewal. The leadership had the resources that were necessary to fund improvements that employees noted were important to their jobs and to their workplace quality, such as a renovation project to the employee kitchen and break room. The leaders reflected that the purpose of the ABC system was to prepare for long-term fiscal stress. In the short term, they were willing and able to provide incentives for the employees to participate and buy into the system and the changes that it would require. Most organizational participants felt that now that the employees had incorporated their time tracking activities into their regular activities, there was little additional burden to the employees. If employees were no longer bothered by the ABC time tracking, this suggests that slack resources might be especially important to get employee buy-in and routinize the changes necessary for ABC.

### **Transaction Cost Influences**

The theory that transactions costs are a significant factor in the development of cost accounting systems can be observed in both the case development and the interviews. The constraints of transactions costs on ABC utilization were particularly clear in the City Council's decision to exempt the Police Department from tracking its activities. Police activities, such as crime prevention and patrol, have above-average levels of both asset specificity and



uncertainty, which lead to high levels of transaction cost according to Brown and Potoski (2003a)<sup>20</sup>. The Public Work's activities such as waste collection, street/parking lot cleaning, and building and grounds maintenance, are some of the lowest transactions cost activities. Administrative activities rank in the middle of reported transactions costs. Because of the high transactions cost, the Police Department has the strongest incentive to resist the ABC implementation as it can leverage its asset specificity and service uncertainty to maintain its autonomy and its demand for greater service flexibility. Administration and Public Works, which are generally thought to have lower transaction cost, did not resist the development of ABC. Ultimately, the City Council decided to allow the Police Department not to track all its activities and actual time pattern of its operations in the ABC initiative, a result that would be suggested by transactions cost theory.

It should be noted that while transactions costs may be a major explanation here, alternative theories may also plausibly explain the decision by the city council to exempt the Police Department from ABC. For example, the Police Department may have greater political power to resist bureaucratic intrusions into its affairs due to the large size of the department and its connection to the community. If the ABC initiative was an additional bureaucratic burden without perceived benefits to the department, then the department had more political leverage to resist the ABC effort. Bureaucratic burden to the department was a reasonable motivation for resistance and this would appear to be supported in the case. The Police Department was willing to make a one-shot estimate of their time allocations by program. What they were not willing to do was to count and track their time on a regular basis, as was

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<sup>20</sup> Police activities are also the highest transaction cost services analyzed by Levin and Tadelis.

being done in the Public Works and Administration departments. This provided a sharp contrast to the response of the Administration Department, which also faced a new additional burden from the ABC system. However, unlike the police, they lacked the political power to push back. Hence, even though the administrative burden of ABC may generate resistance, as reported in the literature (Kaplan and Anderson, 2003), it seems to be insufficient to explain the differential treatment of the departments by the Council. Other factors, such as political reasons or transaction costs, may be more important.

On the importance of transaction costs, a comparison of the Public Works department to the Police Department can be quite illustrative. If the ABC system threatened the Public Works department, the department could have fought the requirement just as the Police had, but they did not and tended to take a wait-and-see approach. In fact, they thought that the new system might reduce some of their uncertainty in the upcoming budget process since ABC could potentially showcase the department's activities and bring a more positive outlook for the department. While politics and bureaucratic burden were still evident in the case, the key dimensions of transactions costs seemed to have influenced the perceptions of burden by the Public Works department.

While the case development is highly suggestive of transactions costs influencing implementation, the interviews revealed directly the mechanisms of transaction cost theory.

For example, on the topic of uncertainty, one departmental manager explained:

“The one downside and the one thing that may be in some staff's mind (is that it will be used) ...to cut out a process because it costs too much, and how is that going to affect my job? If they decide that they are not going to do (an activity), then that is a huge

time commitment from my staff and if that goes then does that mean that the staff goes? ... I think people look at it as a threat.”

Another manager felt that providing specific numbers on individual services that they were performing and asking the council to choose among priorities would create uncertainty for the manager’s department in the budget process. When the council knew exactly what activities a department did, they might have more informational advantage to reallocate funds based directly upon the provision of the services or what one analyst called “a la carte service provision”. For example, services for departments were often interrelated and were traditionally lumped together in the department’s budget. The unintended consequence of eliminating a service might affect the provision of another valued service. At least one manager noted that unadvised changes by the council could produce negative outcomes.

“They are the council but when you bring them in for four or five (*budget*) sessions it gets really difficult because you haven’t been behind closed doors working on it for three months like all the rest of us have. So, it is like, what is our direction, what do you want, and let’s go..... You can only cut so much and that is where we are at. We are at very little breathing room for program and we are scratching now”.

The results of ABC might not describe how managers would like to see cuts made in the departments. Top-level managers were trying to balance uncertainty from budget cuts for the whole organization and preferred to make cuts in the least damaging areas for the entire city. The department directors, however, would be more concerned about their departmental interests and viewed ABC as a tool that would lead to cuts in their departments. The difference of uncertainty caused by ABC between the organizational leaders and managers was an important difference in the perception of transactions costs and the value of ABC.

The difficult concept of asset specificity came out in a conversation with one of the managers. The manager said that the employees of the department were scarce and hard to train. The manager explained, "...staffing is also a worry and it takes us so long to get up to speed when we lose somebody and we still have very few people that want to put in for the profession...." The willingness to work in the profession with all of its sacrifices was seen by the manager as a valuable asset that needed to be conserved and the manager perceived that the cost system could raise the costs associated with providing the department's service. This could happen if the system forced the department to make cuts or that caused valued current employees to quit their job because of uncertainty. New employees would not be as easy to replace as maintaining the current level of employees. Employees are one of the most specific assets of this department and the manager said that uncertainty could lead to unintended transaction costs for the department.

Both the way that the cost system was developed and the interviews with the managers support the transaction cost theory. The organizational leaders acknowledged that the system had unintended costs and that they might even consider abandoning it, if the system did not have benefits that outweighed the costs. However, the organizational leaders were already recognizing many benefits from ABC.

### **Additional Benefits of ABC: Budget, Management, and Performance**

The decision to utilize an ABC system, like any management tool, has to weigh both the costs of the system and its benefits. The organizational leaders and most of the other interviewees tended to reflect that ABC had many benefits. However, these benefits often

differed from the traditional reasons for which cost accounting is used in the private sector. When asked about the benefits that they saw from the ABC initiative, leaders and analysts tended to note budgetary and performance benefits while managers were more interested in general purpose management uses. Generally, interviewees noted multiple purposes for current and future uses. The range of answers suggests that more experience was needed to determine the full benefits of ABC for the organization.

The interview questions were written under the assumption that the organization was not already extensively using the data because the organization had not completed the ABC process. It was quite surprising, therefore, to learn that they were already using it significantly for budget and management purposes. The first use of the data was to show that some services that had a small budgetary impact, such as service to committees, had a much larger budgetary impact when staff time was counted. Although their time tracking of activities was not advanced enough to incorporate all of the indirect costs, it allowed them to see that small programs that were not supposed to be significant, such as community committees, were consuming much more staff time and, thus, organizational resources, than were apparent from the budgetary figures (Figure 4.1). This quote, below, put numbers to a general theme that was voiced about the committees that everyone knew took a lot of staff time but did not realize their costs until they started tracking them:

“There are committees that we say budget four grand for the committee and it is easy when someone says ‘why do we do this?’ Council says ‘We only give them four grand’ but if you give them fifteen grand in staff time then that service doesn’t cost four grand.”

Another use found for the system was tracking staff time for departmental improvements. Operational changes, such as park improvements and new software, could be evaluated on the change in the time that the staff spent doing these new activities. The example of a new park was representative of this benefit. Shortly after the City began tracking activities the city put in a new park with a recirculating stream right next to a sandbox. The children that played in the sand loved to throw the sand into the stream, causing the parks department a significant amount of additional work as the sand would get into the motors of the recirculating stream leading to motor failure. The interviewee noted the expense of the pumps, but just as significant was the cost of all the labor taking the pumps out and rebuilding them. The additional time costs documented by ABC, which doubled the cost of the problem, would have been lost in a traditional financial management system. The interviewee noted that the ABC system allowed them to track the time spent on this park and compare it to the period before the park was renovated. This information could be used to either justify another parks maintenance person in the budget process to keep the recirculating stream operating or to redesign the park to minimize the costs. The ABC system gave the parks department a better perspective of its use of operational resources than with traditional financial management and personnel management systems that were separate.

Besides managerial improvement, the hope expressed most explicitly was that it might help the budgetary process. One leader put it quite directly, "I think the biggest potential is with the budget. Can we be successful in using activity-based budgeting to prioritize our resources and when there are budget cuts, or, if there is ever any revenue excess, where should

that dollar go or where should it be cut?” The analysts and leaders often agreed and noted that the cost data would be useful for making budgetary priorities when dealing with fiscal stress.

Organizational leaders also looked at their ABC system as a critical part of their future performance initiatives. One leader said, “I hope that we get to performance management as well so that not only with budget (uses) but with performance management: what are we putting in the system and what are we getting out as outcomes.” Only one department director gave an example of a performance use of the ABC data, which was to benchmark the costs of services. Overall, some organizational leaders seemed to be more aware of the potential performance uses of ABC data, but this was not recognized throughout the organization. This was especially true at the service level, where employees and even their department managers did not justify ABC in terms of potential performance management benefits.

The interviews show that ABC could be helpful to management, budgeting, and performance-related initiatives. Interestingly, the traditional uses of cost accounting, such as cost determination and cost control, were not mentioned as the major benefits by the interviewees and did not seem nearly as significant as budgeting, performance, and management uses in this case. More experience would be needed to determine the full range of benefits from ABC for the city, but the city seemed to have already found some uses of the ABC system that were not anticipated in advance.

[Figure 4.2]

## Contextual Factors in Implementation

ABC has been studied extensively in private organizations, particularly in manufacturing settings. In the United States, however, only a few studies examined the implementation factors of ABC in a local or general government setting. The paucity of studies does not mean that there are not strong expectations for factors that will affect the implementation of ABC.

Leadership was noted by the department heads as an important factor in motivating the utilization and implementation of ABC. One department head said very simply:

“I would say that (*the City Administrator*) is a huge proponent of it, which makes a huge difference. If he didn't care for it or didn't want to do it, we wouldn't be sitting here no matter what. If for some reason he left and the next person comes in, we could very well not do anything with it” (italicized portion replaces the name).

The actions of the organizational leaders showed that they were very aware of their central place in setting the tone for the implementation. The preparation for the ABC initiative was started by the organizational leaders as a general change initiative. They said that they concentrated very early on in making the process a smooth one for the organization. A process that promoted buy-in from all levels of the organization was thought to be important, so the leadership worked to make sure that all employees had a chance to offer suggestions and voice concerns. The actions of the leaders show how they made their example central to the ABC process without overly involving themselves in the details. Leadership, particularly provided by the City Administrator, was essential to moving the process along.

On the whole, interviewees did not reflect that organizational structure substantially affected the implementation. Only one analyst mentioned the organization structure as contributing to the difference in treatment between the departments, but it was also noted



that the current chain of command was not in place very long. When he was hired, the City Administrator gained the authority to hire and fire the department heads in the organization, but the organizational leaders that I spoke with suggested that the council would not have supported the decision to sanction an employee for resisting the effort to implement ABC citywide. It seems reasonable to suggest that other factors were more salient to the implementation than the chain of command found in the organizational hierarchy.

It is also hard to determine the effect of organizational structure on this small city. It was noted that the City Administrator's leadership was essential to the successes of the ABC initiative, but the size of the organization meant that most of the interview participants personally knew the Administrator. The small organizational size might have attenuated the need for hierarchical control and formalization. On the other hand, the small organization and the lack of an institutionalized chain of command also contributed to the City Council stepping in and overriding the administrator on the case of the Police Department's involvement with the ABC initiative. Likely, contextual factors such as size and structure influenced the implementation, but their effect is difficult to discern in this case.

### **Case Study Conclusions**

This case study lends support to the theory that transactions costs influence the implementation and thus the utilization of cost accounting methods such as ABC in cities. Furthermore, additional benefits that are recognized during implementation and that are not traditionally associated with ABC were found to be important incentives for implementation and utilization. The analysis suggests that fiscal stress and slack resources were influential

factors on the city's use of ABC. Of less significance for the small, local government were contextual factors such as organizational structure, size and union relationship. These factors might be less significant in an organization that was small and in which personal characteristics such as leadership assumed a greater role. Like business implementations of ABC, leadership was critical for the implementation and likely the continued use. Hence, this case study shows that the integration of transactions costs into the standard explanation for successful innovation implementation provides new avenues for understanding the utilization of financial management tools such as ABC.

This research is limited to a single case, which has important implications for generalizability. The previous literature noted that ABC was especially difficult to implement for a small city. Therefore, the success of this city at partially implementing and benefiting from their ABC system provides a possible argument that ABC can be utilized more widely, especially in larger cities that have been shown to have more capacity to implement innovation . This small city case study also allows for a fairly simple analysis of a whole organization and a description of complications. However, a single case study has many limitations. Therefore, future research should continue to explore the determinants of implementation success, especially in larger cities, counties or states. It would also be of interest to explore how transactions costs influence other types of public organizations, such as the federal government or hospitals.

The resistance by the Police Department to the initiative warrants further discussion and consideration of how transactions costs might be minimized for high transactions-costs

departments. Improvements in ABC, such as Time-Driven ABC, may be more appropriate for high transactions-costs services. It is interesting to note that the organization developed a heterogeneous cost system, similar to a hybrid cost system. Further investigation of how hybrid cost systems may be able to minimize transactions costs also seems warranted.

Given the theoretic significance to performance management and fiscal stress for public organizations that stretches into the future, research into cost accounting systems such as ABC is still needed for general purpose governments such as cities. This case study suggests that ABC remains a topic of interest, primarily because it is a positive organizational response to fiscal stress and shows how ABC can be linked to performance management and budgeting. Future research may focus on other potential benefits more and see how the issue of transaction costs impacts the benefit-cost calculation of different departments in different organizational settings.

## **Chapter 5: Cost Accounting at the Service Level: A Transaction Cost Analysis**

The previous chapter showed how transaction costs influence cost accounting practices during cost accounting development and implementation. The participants in the case study articulated transaction costs in terms of mundane and economic transaction costs as predicted by theory. They also revealed how fiscal stress, slack resources, and contextual factors may contribute to the development of cost accounting in a public organization.

The following analysis looks more specifically at the economic transaction costs in the cost accounting plans of 30 large U.S. cities. The economic transaction costs are analyzed separately here because the positive accountancy model anticipates the mundane transaction costs (Langlois, 2006). The theory developed in Chapter 2 suggests that it is the economic transaction costs that influence the cost accounting practices of cities.

This chapter analyzes 64 services that are common to city government. It matches data from city cost accounting plans, comprehensive annual financial reports (CAFRs), budgets and generally available public data to analyze the likelihood of services being measured in the city's cost accounting plan. The analysis reveals that transaction costs and contextual factors are significant but not always as predicted by theory.

### **Research Expectations for the Determinants of Cost Accounting of Services**

The research expectations to be tested come from a simplification of the theoretical model presented in Chapter 2 (Figure 2.8). While the full model shows that slack resources and

contextual factors mediate the effect of fiscal stress on the use of cost accounting, the available cross sectional data on cost accounting practices will not allow for a test of interdependence between the concepts. The effect of slack resource and contextual factors influencing transaction costs would be difficult to test with only 30 cities. Furthermore, the long term relationship between cost accounting at the service level and the reduction of fiscal stress for the organization is not well suited to test by cross-sectional means. Ideally, this relationship would be tested using longitudinal data. Unfortunately, there is almost no longitudinal data on cost accounting practices. For these reasons, I have chosen to test only the relationships between concepts marked by the solid lines in Figure 2.8.

The study hypothesizes that high levels of fiscal stress should positively influence the utilization of cost accounting. Thus, where organizations have high levels of fiscal stress, governments will tend to utilize more cost accounting. Furthermore, the presence of slack resources will also facilitate the use of more service level cost accounting because the organizations with slack resources should be able to buy off dissenters or provide funding for other valued objectives to the department and service level managers. While there are practical reasons for a negative relationship between fiscal stress and slack resources, this interdependent relationship is simplified to one of individual effects.

At the service level it is expected that economic transactions costs will be negatively related to the use of cost accounting. High asset specific services are expected to have low levels of utilization of cost accounting. Furthermore, the uncertainty dimension of service

measurability is also expected to lead to lower levels of cost accounting because services that are difficult to measure should also be more difficult to develop accurate cost accounting.

The contextual factors discussed will also have an effect upon the use of cost accounting at the service level. Professional leadership, hierarchical organizational structure, larger organizations, and those with positive union relationships are all more likely to utilize cost accounting at the service level. Performance measurement at both the organizational and departmental levels is also likely to lead to more cost accounting because they have indicated their willingness to measure the service.

### **Empirical Model of Service Level Cost Accounting**

The forgoing analysis uses the cost accounting plans of 30 large U.S. cities to determine which services measured their indirect costs to develop a service level cost accounting. The 64 services analyzed and the 30 cities created the problem of a multi-level or hierarchical data structure. The probability of a service being selected in some cities for cost measurement is greater than in other cities, which can cause the error terms to be correlated and violate the traditional assumptions of regression<sup>21</sup>. The method of using hierarchical or multilevel modeling is the preferred method for estimating statistical models with this nested structure (Gelman and Hill, 2007; Raudenbush and Bryk, 2002).

Formally, the models take the structure of a system of equations with the level 2 variables being substituted into the intercept in equation 1. The subscript  $j$  denotes the city

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<sup>21</sup> A common measure of the level at which the error terms are correlated is the interclass correlation coefficient or ICC. The ICC for the 30-city cost accounting data was .062 and the standard level at which multilevel modeling becomes appropriate is usually regarded to be an ICC of .05 or greater. Therefore, a multilevel model is appropriate for this analysis.

and controls the intercept of the level 1 predictors ( $X_{1j}$  to  $X_{nj}$ ). The effect of the city variable ( $w_j$ ) is to change the intercept of the level 1 predictors for each city ( $j$ ) and is generally known as a random intercept model. The equations are estimated simultaneously using maximum likelihood.

$$(Eq.1) \Pr(y_{ij} = 1) = \text{logit}^{-1}(\beta_{0j} + \beta_{1j}X_{1j} + \dots + \beta_{11j}X_{11j} + r_{ij}) \text{ (Level 1)}$$

$$(Eq.2) \beta_{0j} = \gamma_{00} + \gamma_{01}w_j + u_j \text{ (Level 2)}$$

Because the outcome of interest is whether a given service ( $i$ ) is measured in a cost accounting plan, the dependent variable is a dichotomous (0 or 1) variable of whether the service is measured or not. Because the outcome variable is dichotomous, it must be transformed to be distributed in the manner just described. The transformation uses traditional logistic regression. This means that the residuals  $r_{ij}$  is assumed to have a logistic distribution and homogenous variance across the cities and the residual of the level 2 model ( $u_j$ ) is assumed to be a normally distributed with a mean of zero. The models and estimates derived were conducted using the lmer command in the lme4 package of the R statistical computing environment v2.15.0 (Bates and Sarkar, 2007).

### **Description of Cost Accounting and Transactions Cost Data**

The data for this analysis comes from two email requests made to the finance directors of all cities over 100,000 population in November and December of 2011 to provide their organizational cost accounting plans. An initial request was sent at the end of November 2011 and a follow-up request was sent two weeks later. This resulted in a response of 30 cities out of the 272 total cities allowing access to their cost accounting plans. This represents just over

11% of the population. This level of response is fairly typical for cost accounting research. For example, one of the largest cost accounting surveys of businesses and government had a response rate of just over 9% (Ernst and Young, 2003). The method of multi-level modeling has been shown to be efficient and useful for generalizing information to the population with groups as small as 5 and units per group of more than 10 (Austin, 2010).

The 30 cities come from all regions of the country and range in size from cities with a population of just over 100,000 to some of the largest cities in the country. Table 5.1 shows that the cities are slightly larger than the population but the sample is not significantly different from the population. Likewise, there were slightly more cities from the south than the other regions of the country but this difference is not statistically significant.

[Table 5.1]

The dependent variable is whether the city measured indirect costs for 64 services in the cost accounting plan with a cost driver. As described above, the presence of a cost driver to measure the cost of a service was coded as a 1 and the absence of a method of measuring the cost of overhead for the service in the cost plan was coded as a 0. The 64 services are taken from Brown and Potoski (2003a). However, most cities did not provide all of the services; therefore, the analysis is only run on services that are discussed in each city's budget, which resulted in 1122 services being analyzed.

The explanatory variables of interest are the levels of asset specificity and uncertainty for 64 services taken from Brown and Potoski's work on contracting (Brown and Potoski, 2003a; Brown and Potoski, 2003b). The variables were developed by the authors by surveying 75



randomly chosen city managers and mayors. The respondents were asked to rate each of the 64 services on a scale of 1 to 5 for both the level of asset specificity and measurement uncertainty of the service. The responses for each service were averaged to create the measures of asset specificity and measurement uncertainty.<sup>22</sup>

Services that have high levels of specialized equipment and training have higher levels of asset specificity. For example, the highest levels of asset specificity are for services such as hazardous materials disposal and for the operation of airports and hospitals. These services have the highest level of asset specific technologies and skills. The lowest asset specific services are those for which little training or technology is required such as secretarial service and parking lot operation and maintenance. The measure of asset specificity is taken from managers' perceptions of it and is measured on a 1 to 5 scale. Table 5.2 shows that the mean asset specificity for the 1122 services is 3.05, which is slightly less than the mean for all services of 3.08 found by Brown and Potoski (2003b).

The measures for uncertainty are also taken from Brown and Potoski's work. Their service measurability scale asked managers to measure how difficult it is to measure a service on a 1 to 5 scale with 1 being easy and 5 being difficult. Services such as public health and mental health services are some of the highest uncertainty services because it is so difficult to measure the outcome of these programs that would usually require separate and extensive evaluation. Conversely, building and grounds maintenance are some of the lowest uncertainty programs because these programs' inputs, processes, outputs, and outcomes can be easily

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<sup>22</sup> Refer to Brown and Potoski 2003b pgs 451 – 452 for individual values for asset specificity and measurement uncertainty. Additional information regarding the data collection procedures can be found in Brown and Potoski 2003b pg 466.

measured. Table 2 shows that the mean measurement uncertainty for the sample is 2.61, which is slightly less than the mean for Brown and Potoski's scale of 2.67.

The other variables in the analysis here were taken from a variety of sources that included budgets, CAFRs, and other sources. The measure of slack is unreserved fund balance per total expenditure taken from the governmental fund statements of a city's CAFR. The fiscal constraint measure was measured by the presence or absence of a tax and expenditure limitation on property tax (Yusuf et al., 2012). The other variables for the theoretical model were taken from several sources. The variables for manager and hierarchy were taken from the city budget. The manager variable is a city manager that has executive responsibility and is not elected. The variable that measures the hierarchy of the organization is the number of levels in the organization chart taken from the budget between the public and the law enforcement department. For example, an elected sheriff would be "1" because there is only one level between the law enforcement department and the public. A Mayor with a sheriff that reports directly to the Mayor would have two levels. A mayor that has a chief of staff or a city manager and a police department head who reports to the city manager would be a "3" and so forth. This level counting method is new to this study and proxies for the usual survey questions regarding hierarchy. This measure does not measure the hierarchy of individual departments but generally proxies the hierarchy of the organization because almost all local units of government have law enforcement departments and generally give them the most direct access to top elected officials and the public of nearly all departments. The organizational personnel variable measures the size of the organization and is the number of full-time-equivalents taken from either the budget or the CAFR. Departmental performance measure is

measured by the presence or absence of performance measures in the departmental budget for a service. Organizational performance is whether the organization includes performance measurements in the introductory sections of their budget document (Ho and Ni, 2005). The union variable comes from the National Labor Relations Board list of states that have right-to-work laws (NLRB, 2012).

[Table 5.2]

### **Hierarchical Models of Cost Accounting at the Service Level**

The analysis of transaction costs influences on cost accounting practices reveals that asset specificity is negatively related to the measurement of indirect costs at the product or service level in all models (Table 5.3). Services that have greater uncertainty surrounding outcomes were also thought to be negatively related to cost measurement because of transactions costs. However, the results show that services that are more difficult to measure actually have a positive and significant relationship with indirect cost measurement of services. This result and those concerning performance measurement are discussed in the conclusion.

Table 5.3 presents three models that describe the determinants of cost accounting at the service level. Model 1 is the full model with all of the variables of interest in the theoretical discussion. Models 2 and 3 are presented because there was a high correlation between cities that have city manager forms of government and the hierarchy of the organization. These two variables are important institutional features that may influence the measurement of indirect costs of services. Therefore, the full model was run with the variable manager and hierarchy

omitted. Model 2 omits the variable manager and shows that hierarchy is approaching standard levels of significance. Model 3 omits the variable for hierarchy but the variable for manager stays insignificant by standard levels.

[Table 5.3]

The log-likelihood of the three models shows that Model 3 has worse fit than Models 1 or 2. Models 1 and 2 fit the data equally well, but because Model 2 has fewer variables than Model 1 it has a lower AIC. This suggests that the best fitting model for the data is Model 2. The variance of the city level random effects is minimized in both Models 1 and 2. For these reasons, the preferred model is Model 2 and the results discussed will generally refer to this model.

In all of the models asset specificity is significantly and negatively related to the measurement of indirect costs of services and uncertainty is positively and significantly related to cost measurement at the service level. In Model 2, the coefficient for asset specificity is  $-.86$  which corresponds to a change in the odds of using cost accounting at the service level to  $.43$ . To visualize the effect of asset specificity over the range of measurements (Figure 5.2), the predicted probability over the range is  $.323$  to just  $.054$ . In other words, the probability of cost measurement for the lowest asset specific services is just under one in three. The highest asset specific services measure indirect costs in a little more than 1 in 20 services.

The measure for outcome uncertainty is also statistically significant but in the wrong direction predicted by standard transactions cost theory. When outcome uncertainty increases, the measurement of indirect costs for services increases by  $1.03$  on the logistic scale.

Log transformed into an odds ratio, an increase of 1 unit on the measurement uncertainty scale by Brown and Potoski makes indirect cost measurement 2.8 times more likely. In Figure 5.2 the predicted probability of indirect cost measurement ranges from just .048 to .393. This increasing usage of cost accounting measurement with increasing measurement uncertainty suggests that uncertainty may be a different consideration than asset specificity, a finding which is discussed in the next section.

The use of performance measurement at both the departmental level and the organization level was significant. However, performance measurement at the departmental level is the opposite sign of performance measurement at the organizational level. The departmental performance measurement variable, which indicated whether the city reported performance measures in the departmental budget for the service, was negative and significant by standard levels of significance. The odds ratio for departmental performance is .51, which means that departments that report output or outcome performance measures measure indirect costs only 51% of the time. In contrast, organizations that report performance measures in the introduction or general sections of their budgets are 2.4 times more likely to measure their service level indirect costs. Both variables are significant and will be addressed in the subsequent discussion.

The other contextual variables were only modestly significant or were not significant by standard levels. The hierarchy variable of Model 2 approaches the standard .05 level of significance. Substantively the variable is not large but the odds of measuring indirect costs of a service increase by 1.36 times if the hierarchy variable increases by one unit. The other

variables in the model are insignificant. Larger departmental expenditure, organizations with more personnel, and cities that are in right-to-work states tend toward less indirect cost measurement. These results are opposite of that predicted by theory but are not significantly different from zero. Hence, there is little reason to believe that these variables substantively influence the use of cost accounting at the service level. Professional managers, tax limits, and governmental slack are of the correct sign but are also insignificant.

Overall, Model 2 shows that a city's decision about whether to measure the indirect costs of a service is influenced by asset specificity, measurement uncertainty, performance measurement, and the contextual variable of hierarchy. These results are quite consistent under different model specifications (see Model 1 and Model 3) and support some of the transaction cost hypotheses. They also point to interesting new ways to understand the tradeoffs that managers make regarding whether to measure performance or cost data. These results are discussed further in the next section.

[Figure 5.2]

### **Discussion of Model Results**

These results partially confirm the transactions cost theory and compliment the literature of cost accounting in businesses. First, the results confirm that asset specificity is likely to be the most important element of transactions costs in public organizations. Practitioners and researchers should pay attention to the elements of asset specificity to determine how they may influence transaction costs when using cost accounting. Because of asset specificity, departments that have asset specific resources can bargain with those

resources and push back on the use of cost measurement of their services. These results confirm the theoretical effect of transaction costs.

Service measurability uncertainty is positively related to cost measurement. One interpretation of this finding may be that services with output or outcomes that are more difficult to measure tend to be ones where organizations are interested in measuring their costs more accurately. Programs such as mental health are difficult to measure because there are many factors that influence the final outcomes. These programs may not be ideal for outcome measurement. Instead, it may make more sense to accurately measure the actual cost of providing services and comparing these costs to other available alternatives or a remedialness criterion (Williamson, 1999). So instead of focusing on effectiveness, cost efficiency may be the primary concern of the management. If the service is cost competitive, then the service can be justified by the remedialness criterion and the values determined by the political process (Lindblom, 1965; Wildavsky, 1964). The empirical finding that cost measurement may be substituted for outcome performance measurement is one that should be taken seriously by scholars that advocate a theoretical reason for always measuring the final outcomes of programs (Hatry, 2006; Poister, 2003). If outcomes are difficult to measure, an important second best measurement might be a good measurement of the resources and process performed in the creation of the service.

The other possible interpretation of the finding surrounding uncertainty of service measurability is that the concept of service measurability uncertainty is not fully developed. Likely, there are many different dimensions of uncertainty within service measurability. It is not

clear from Brown and Potoski's description and definition of service measurability what part of the programmatic logic model the concept is measuring. Service measurability may be related to the output or the outcome of the service but that is not delineated in their variable measurement. Even the level of process may be captured by their measurement of service measurability. Hence, this concept needs to be explored further and perhaps more future work should explore alternative measures of uncertainty.

The findings regarding performance measurement also support the first interpretation of the finding for service measurability. It seems logical that managers would want to measure outputs and outcomes. In fact, performance management scholars note that measures of efficiency are particularly underdeveloped (Ho and Ni, 2005; Julnes and Holzer, 2001). This is likely because departmental managers have a strong aversion to being held accountable for service costs, which they may not fully control (Simon, Guetzkow, Kozmetsky and Tyndall, 1954). In contrast, organizational leaders, such as city managers or budget directors, have a strong incentive to measure costs as rigorously as possible because it reduces their uncertainty in budget and financial management of organizational subunits and it reveals important process-related information that is useful to the organization. Hence, while department and service-level managers resist cost measurement, organizational leaders that are interested in data-driven management will push to have a more thorough understanding of the direct and indirect costs of programs and services.

Despite the above interesting findings, this research has limitations that should be addressed in future research. For example, the study accounts for only 11% of large cities.



Future work could expand this sample and work to create a longitudinal dataset of cost accounting practices. Furthermore, the 64 services that were analyzed were those for which there was readily available transactions cost data from Brown and Potoski. There are many services that are measured in the cost accounting plans that do not have measures of asset specificity and uncertainty, such as purchasing, audit, and risk management, and they were left out in the analysis here. These are generally support services that should not have a high level of asset specificity or uncertainty and so they likely will not bias the findings presented here. However, future studies may look into these services more closely to see how transaction cost considerations impact their cost accounting practices.

### **Conclusions on the Analysis of Service Level Cost Accounting**

The results of this study extend the understanding of transactions costs theory into new domains for public organizations. Asset specificity reduces cost measurement at the service level as predicted by theory, but the finding that service measurability uncertainty led to more service level cost accounting is also interesting. Departmental managers and organizational leaders have different preferences about what should be measured. Services that have outcomes that are difficult to measure might be more suitable for cost measurement. These results indicate that economic transaction costs are important elements that shape the utilization of cost accounting systems of public organizations, but there are also important exceptions to the theory that point to the need for continued future research in this area.

## Chapter 6: Why Do U.S. Cities Utilize Cost Accounting? An Analysis of Four Common Reasons

Why governments utilize cost accounting is a question that is important in the current climate of fiscal stress. It is especially timely for local governments, such as cities, that cannot devolve responsibility for services to a lower level of government. The previous discussion looked at the effect of transaction costs on services within an organization. Both the qualitative and the quantitative analysis showed that transaction costs have important effects upon the development of cost accounting *at the service level*. What has been neglected to this point is a discussion of why cities would want to use cost accounting other than for cost management and performance management purposes *at the organization-wide level*. Cost accounting can also be used to set rates to charge for services and for purposes of collecting grant dollars for overhead resources used. This research adds to the discussion of why governments are utilizing cost accounting at the organization-wide level by showing that governments that use cost accounting generally experience fiscal stress, but the use of cost accounting is not significantly related to amount of grant dollars received by the government, the amount of expenditures by governments on enterprise activities, or performance budgeting. All of these activities can logically be tied to cost management, but the following analysis reveals that the only significant predictor of cost accounting is fiscal stress.

In the past, cost accounting was seen to be an important tool for dealing with fiscal stress (Coe and O'Sullivan, 1993; Levine, 1985). It is the tool that bridges the gap from the

prospective policy of the budget to strategic decision making about what types of services and management are the most cost effective. It further has the benefit of being useful for setting correct rates for services that are provided via user charges, providing accurate information to put performance into perspective, and allows grant overhead costs to be collected. In spite of these reasons for cost accounting, there is little recent research on why governments adopt or continue to use cost accounting.

In fact, there is very little research at all on cost accounting in government, which makes the question of why local governments use cost accounting an important topic. This analysis reviews the main reasons for cost accounting in the literature, which include performance management, rate setting, recovering grant overhead, and cost management. It then tests these reasons for cost accounting on a cross section of 78 U.S. cities over 100,000 population. The results confirm that fiscal stress is related to cities using cost accounting. However, the variables for performance, grants, and rate setting were insignificant, suggesting that there is much to be learned about why city governments adopt cost accounting and how they use the tool to deal with fiscal stress.

### **Literature and Expectations**

#### *Four Reasons: Rate Setting, Performance Netting, Grant Getting and Blood Letting*

Recently, researchers in public administration have expressed renewed interest in cost accounting but have suggested that practical knowledge of it is “limited” (Rivenbark, 2005; Williams, 2003). The review of the literature suggests that there are four primary reasons that local governments use cost accounting, and the literature on business’s use of cost accounting

suggests that there are a variety of contextual or institutional factors that would affect the utilization of cost accounting.

Renewed interest in cost accounting comes from a camp of scholars not directly concerned with accounting but with government performance (Melkers, 2003; Premchand, 2006; Rivenbark, 2005; Williams, 2003). Modern conceptions of performance are concerned with shifting attention from outputs to outcomes (Hatry, 2006), and one of the most important outcomes is the cost-effectiveness of public programs (Hatry, 2010). Studies largely find that cost-effectiveness or efficiency measures are one of the least reported types of performance measurements (Ho and Ni, 2005; Julnes and Holzer, 2001), which some authors suggest is because cost data is not sufficiently comparable (Ammons and Carter, 2000). Cost accounting can, therefore, enhance measurement of efficiency by including all of the costs, direct and indirect.

Cost accounting is also critical to benchmarking because it is important to account for all levels of resources when comparing the results of different cities' services (Ammons and Carter, 2000; Ammons and Rivenbark, 2008; Rivenbark, 2000). It may be misleading to compare the outcomes of a city department to a similar department in another city if the departments do not have equal levels of resources. Cost accounting allows for this comparison by including overhead such as employee benefits, capitalization costs, and indirect resources such as human resource and information technology support. While the need to account for the cross functional costs that go into services is well developed in the performance management literature, with the exception of the North Carolina benchmarking project, there is little

evidence that cost accounting is a standardized practice for local governments for performance measurement or otherwise (Rivenbark, 2005).

In spite of assessments that cost accounting is not well developed in local governments for performance uses, performance is an important trend in public financial management (Berman and Wang, 2000; Ho, 2011; Melkers and Willoughby, 1998). It should be expected that as local governments further utilize performance measurement they will seek out ways to more accurately measure the costs of their services. It is to be expected, therefore, that those governments that report performance for their departments and services will have a greater likelihood of utilizing cost accounting.

The original use of cost accounting was to set rates for activities such as the railways and textile factories. Being able to recover the full costs of production is a key to profitability for any business. Because governments do not primarily rely upon markets for the resources to sustain themselves, cost accounting is not as critical for government entities. However, as local governments have responded to fiscal stress over the last quarter of a century, they have relied more upon user charges to fund some services (Jung and Bae, 2011; Sun and Jung, 2012).

While the literature on user charges assumes that we know the full (and correct) cost of the services, one of the original reasons for advanced cost accounting methods, such as ABC, was that cost accounting in the 1980s was not sufficient to provide accurate costs in the face of global competition (Johnson and Kaplan, 1987; Kaplan, 1988). ABC was criticized for being overly relied upon by local government in certain contracting and budgeting decisions (Brown, Myring and Gard, 1999; Mullins and Zorn, 1999), but other research showed that it was

valuable for helping to set accurate rates and compare costs in these decisions (Coe and O'Sullivan, 1993; Weiss, 1997). These experiences with ABC and the practical realization that setting accurate rates for utilities or enterprise activities requires an assessment of the indirect resources that are used in production will likely lead to greater usage of cost accounting in a government with higher levels of enterprise activity. On the other hand, it is possible that governments may simply rely upon the use of outside consultants to help set their rates. Also, as Mullins and Zorn (1999) charged, the cost accounting system, including the more advanced ABC system, does not consider externalities, and governments may want to consider these costs in their rate setting as well. Despite these criticisms, cities that have higher levels of enterprise activity should have a greater incentive and, therefore, the likelihood of utilizing cost accounting.

Another reason that governments utilize cost accounting is to recover the cost of overhead and indirect costs in the reimbursement of their grants. Organizations that receive over \$500,000 from the federal government are required to file single audits. If the public organization is going to count any indirect expenses, such as building space, utilities, or other administrative expenses, to go along with the direct expenses charged back to the grant, they must have a cost accounting plan to establish indirect cost rates (Circular A-87, and 2 CFR Part 215). Other programs that include the need for cost accounting, such as FEMA disaster assistance, require that to be reimbursed for time spent cleaning up after a storm or natural disaster the city must keep separate records that also account for indirect expenses.

Therefore, the need for cost accounting at both the state and federal level for grants should promote the utilization of cost accounting systems. If governments forgo cost accounting, they may also forgo receiving compensation for the cost of overhead resources. At the same time, some organizations may choose not to account for these costs because they feel that the cost recovery does not justify the cost of measurement. Further, they may also believe that including these costs in grant applications makes their grants less competitive. As a result, while cost accounting is required to recover overhead costs for grants, it is not necessary that all governments that receive grants utilize cost accounting. Given the above dynamics, this study hypothesizes that as organizations get more of their resources from grants, they should have greater incentive to capture their indirect resources in the discharge of grant activities for which the organization needs to be compensated. Therefore, a larger relative level of grant resources should be associated with a higher probability of utilizing cost accounting.

A final use of cost accounting is using it to reduce the cost of providing public services, or cost management. Cost management is all of the activities that a government might employ to drive down its cost. It is a response to fiscal stress that forces governments to prioritize services and look at alternative means of service provision. Cost management may mean simply cutting out things that are not needed in production, or it might be a very painful elimination of a service that does not have the priority of other valued services. Either way, cost accounting and cost management is a common response to fiscal stress (Levine, 1985).

Cost accounting and management can be utilized in a variety of ways. Coe and O'Sullivan (1993) found that cities that had a centralized cost accounting system thought it was

important for justifying budget decisions and deciding whether to contract services. The City of Indianapolis used cost accounting to learn that many of its public works procedures were inefficient. The city then put its services out for bid and allowed the city department to bid on the job. The department won most of the bids because the department was able to drive costs down by 60% (Kehoe, 1995). The Army had a similar experience with cost accounting and managing for costs. When they looked at how much the cost of keeping additional warehousing and dining facilities was adding to the total cost of running a garrison, they concluded that the over-use of these indirect costs could be reduced and the savings could be spent better elsewhere (Geiger, 2010).

These examples justify cost accounting as a useful response to reduce total costs, but cost accounting is also important for making informed decisions about alternatives. As the case study of the public health clinic in Kaplan and Atkinson (1998) notes, a lack of cost accounting could obfuscate the least costly of two equivalent services such as in-home versus hospital dialysis treatments. In this case study, the treatment options produced equivalent results for the patients but, because the method of cost accounting obscured the true cost of indirect resources used in the hospital treatment, this apparently more profitable treatment was actually losing money and being subsidized by the in-home service. This example shows that cost accounting can be useful when choosing between equivalent forms of service provision for a public organization. By not accounting for indirect resources, the hospital may have incorrectly chosen to eliminate the profitable service.



As cities struggle to find resources in the current climate of fiscal stress, they must actively work to reduce costs and to target cuts where they are the most beneficial. Having accurate cost data is critical in this effort. Cost accounting provides the means to both manage costs and make accurate cost comparisons. This suggests that cost accounting is most important to cities that are experiencing high levels of fiscal stress and need to make important cost savings. This important targeted blood-letting is in stark contrast to the predominant salami slicer approach of across the board cuts that may be favored when accurate cost data does not exist. Variables that indicate or lead to fiscal stress, such as low fund balances and tax and expenditure limitations, are thought to justify the use of cost accounting for organizations to deal with their fiscal stress.

#### *Institutional Control Variables*

The four main reasons for cost accounting in the above discussion indicate why a government would utilize cost accounting, but other factors within an organizational environment may also facilitate cost accounting use. The pantheon of business cost accounting research contains a literature on the variables that facilitate the implementation and utilization of cost accounting techniques (Anderson and Young, 1999), and these variables are similar to the institutional variables used in public administration research.

The first of these institutional variables that should be controlled for is the impact of leadership. Lower level managers and employees look to the upper level managers in the organization to see if cost accounting is considered important by the organization. As lower level employees would prefer to keep the costs of their department to a minimum (Simon, Guetzkow, Kozmetsky and Tyndall, 1954) and preserve valuable departmental knowledge

(Crozier, 1964), employees tend to resist cost accounting. Leadership that can demonstrate the critical importance of cost accounting and cost management for the organization can get the organizational buy-in that is necessary to start managing the full cost of services.

A second and related institutional variable that affects cost accounting is the hierarchy of the organization (Anderson, 1995; Gosselin, 1997). The hierarchy of the organization is thought to be important for two primary reasons. The first is that hierarchical organizations have decision makers that are further away from the actual act of creating products and services and so they have a greater need for cost accounting information that can summarize the indirect and direct costs of their products. The second reason that hierarchical organizations utilize cost accounting more is that these organizations reduce transaction costs because lower level managers are not able to influence the organization's leaders directly. As stated before, the lower levels will tend to resist the use of cost accounting if it can shine light on the operational details and may put their department in a negative light. As a result, they may use gaming and bureaucratic politics to avoid revelation of the full cost of the service. The organization's structure can minimize gaming and transactions costs by having a strong hierarchy, which will also benefit from useful cost accounting information.

The next institutional variable of interest is the size of the organization. This is especially important for cost accounting because a larger organization tends to have more activities and more overhead to spread around. More services and more overhead lead to a greater likelihood that large cities may want to use cost accounting to account for those overhead costs. Also, more populated cities and cities with larger budgets usually have greater

complexity in operations and service demand, which may create a greater need for cost accounting.

A final institutional restraint upon cost accounting is the influence of interest groups. Within the cost accounting literature the interest group that is most concerned is typically the unions (Anderson and Young, 1999). Unions tend to discourage the full cost accounting as it tends to show that divisions are not as profitable as they would otherwise appear to be. Positive union relations and positive working arrangements with unions are expected to increase the use of cost accounting.

## **Data and Method**

The data for this survey comes from two email requests made to the finance directors of cities over 100,000 population in November and December of 2011. An initial request was sent at the end of November and a follow up request was sent two weeks later. This resulted in a response of 51 cities out of the 272 total cities. Because the response rate was not very satisfactory, a follow-up random telephone survey of 30 cities was done to simply ask whether the cities had a centralized cost accounting plan in April of 2012. The results of the second random survey were similar to those of the first sample of cities that responded to the email request. The similarity between the random telephone survey and the non-random email request alleviates concerns about generalizability<sup>23</sup>. The observed variable is the presence or absence of a centralized cost accounting plan (Table 6.1). Since this is a cross-sectional study of

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<sup>23</sup> Size and regional differences were not statistically different for the sample and non-sample cities.

cities that either do or do not utilize cost accounting, a logistic regression is used in the following analysis.

The explanatory variables of interest were taken from the cities' 2011 financial statements and their 2012 budgets, which were retrieved from their websites. Three cities did not have completed 2011 financial statements and so the analysis has a final observation count of 78 or 28.6% of the sample<sup>24</sup>. The measure for performance is whether the organization included performance measurements in its 2012 budget document (Ho and Ni, 2005). Total expense was taken from the government-wide statement of activities in the CAFR. The grant variable was also taken from the CAFR and is the percentage of total expense that was accounted for by grants. The need for cost accounting for rate setting is proxied by the amount of business-like expenses divided by the total amount spent on all primary government, and the level of fiscal stress is proxied by the unassigned fund balance divided by the total governmental expenditures taken from the CAFR<sup>25</sup> (Justice and Scorsone, 2012; Wang and Hou, 2012p 155). Furthermore, fiscal stress is measured by an indicator that those cities are located in states with property tax revenue limits (Yusuf, Fowles, Grizzle and Liu, 2012).

Control variables were taken from several sources. The variables for manager and hierarchy were taken from the city budget. The manager variable is a city manager that has executive responsibility and that is not elected. The hierarchy variable is the number of levels

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<sup>24</sup> The small sample size is not unusual for cost accounting research that has a typically very low response rate. Ernst and Young 2003 had a response rate of 9% and a recent survey of local government's ABC practices had a response rate of only 16% (Kennet, Durler, and Downs 2007). Again, the analysis of respondents to non-respondents does not reveal a significant difference between the sample and non-sample cities.

<sup>25</sup> The literature often uses fund balance as a measure of fiscal stress or fiscal health. Other measures may also be relevant, such as measures of fiscal capacity, or deviations from revenue projections, to measure fiscal stress. Given that the literature often uses fund balance to proxy fiscal stress, this paper follows that practice. However, it is noted that the variable is only a proxy measure and should be interpreted as a qualified measure of fiscal stress.

in the organization chart taken from the budget or CAFR between the public and the police department. For example, an elected sheriff would be “1” because there is only one level for the police department. A mayor with a sheriff who reports directly to the mayor would have two levels. A mayor that has a chief of staff or a city manager who reports to the city manager would be a 3, and so forth. This level counting method is new to this study and proxies for the usual survey questions regarding hierarchy. The union variable came from the National Labor Relations Board list of states that have right-to-work laws (NLRB, 2012), and population was from the 2010 Census.

[Table 6.1]

## Analysis

The results of the logistic regression are presented in the table below. They indicate that only one of the explanatory variables of interest significantly contributes to the model of cost accounting use (Table 6.2). The variable on fund balance is negative, which indicates that as fund balance goes up the government is less likely to utilize cost accounting<sup>26</sup>. The analysis confirms that cities use cost accounting more when they have lower levels of fund balance.

Figure 6.1 shows the predicted probabilities for the use of cost accounting for cities with a fund balance between 0 and 20% of total expense. For cities that have no fund balance, the predicted probability of using cost accounting is greater than 75% (76.9%), and as fund balance increases to 20% of expenditures the predicted probability of using cost accounting approaches

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<sup>26</sup> In an alternative parameterization of the model, the fund balance term was also squared to determine if this negative slope followed a logic of optimal fund balance. This term was not significant and the model is not discussed here because there is currently no reason from the literature or theory that would indicate that cost accounting is associated with an optimal fund balance.

20%. Hence, holding continuous variables at their means and using the most common factor variables, 3 out of 4 cities in the model would use cost accounting if they had a fund balance of 0, but only 1 out of 5 cities would use cost accounting if they had a governmental fund balance of 20%. This strongly supports the hypothesis that cities use cost accounting to deal with fiscal stress.

However, the other explanatory variables of interest were not significant. Most of the control variables were also not significant. Organizational hierarchy was significant and in the direction predicted by the literature. As cities become more hierarchical, they tend to use cost accounting more often.

[Table 6.2]

[Figure 6.1]

## **Conclusion**

The results above confirm that cash-strapped cities are likely to utilize cost accounting to deal with fiscal stress, as measured by the percentage of governmental fund balance to expenditures. However, a limitation of this study is that it does not look at the transaction costs of the type of cost accounting system as discussed in the previous section. Lack of data prevented this type of analysis but future research may address this issue. Also, this research does not get into the detailed mechanisms of using cost accounting to target cost reductions. Future research using case studies or surveys may explore this issue further and examine how cities are using what types of cost accounting tools, systems, and strategies to target

reductions. For example, if a government is using cost accounting to deal with fiscal stress through cost management, as this analysis suggests, the type of cost accounting should be similar to either an ABC system or the hybrid system of Chapter 3 where the organization would choose to only measure the cost of services for which it will be beneficial in dealing with fiscal stress. The government will also likely use a cost system that incorporates the cost of measurement, cost of error, and transaction costs.

Finally, while there is no statistically significant relationship between cost accounting and grant getting, rate setting, or performance netting, the author's conversations with managers about why they use cost accounting support all of these reasons. Likely, there is not one preferred reason but many for using cost accounting to deal with fiscal stress. Therefore, future research through case studies and surveys should examine the mechanisms by which cities are using cost accounting to deal with fiscal stress, and how those mechanisms are related to grant seeking and performance management.

## Chapter 7: Toward a Theory of Governance and Financial Management

In the first chapter the case was made for why cost accounting is an important topic for public organizations. Generally, it was noted that fiscal stress, improved technology, and social change, such as the emergence of contracted governance relationships, impel cost accounting in public organizations. There are also reasons to be cautious about the development potential for cost accounting in public organizations like cities. The results of the analysis confirmed that cost accounting development is likely to be piecemeal, or as is suggested in Chapter 3, a sort of hybrid cost accounting. While hybrid forms of cost accounting have only recently been recognized as legitimate, the empirical factors that influence cost accounting development are primarily limited to private organizations and are generally thought to be the product of contextual factors. The model developed here shows the central importance of transaction costs and provides a social science theoretic explanation for the development of cost accounting in city governments.

In the sections that follow, note the cost accounting model proposed in Chapter 2 and the notable factors that were supported in the three empirical chapters. Then turn to the contribution that this research has made to the extant literature of public financial management. Finally, the intra-organizational model of cost accounting development will be extended to consider the inter-organizational relationships found in governance models that relate public organizations to the larger governance context containing other public, semi-public, non-profit, and for-profit organizations. The suggested relationships outlined here can form a new basis for public cost accounting research that moves toward theory-building about governance and financial management.



## Cost Accounting Practices in Cities

The second and third chapters note that there is uneven development in cost accounting in public organizations. Some services get measured more specifically and the ability to manage costs is often contingent upon accurate and useful cost measurement. The third chapter notes that cost accounting is increasingly seen as a necessary tool for public organizations and has benefits for cost management. The second chapter develops the model that was generally tested in Chapters 4-6 (Figure 2.8). It notes that economic transaction costs are different from the traditional transaction costs that are assumed in the positive accountancy model of cost accounting development. Many of the relationships tested, and particularly the transaction cost variables, receive robust support. Some of the variables are only supported in one of the analyses and some of the variables are not supported in any of the analytical chapters. A final model of cost accounting in public organizations is presented below (Figure 7.1).

[Figure 7.1]

Transaction costs are found to be significantly related to cost accounting development in both Chapters 4 and 5. The small city case study shows that departmental managers were worried about the uncertain use of cost accounting. Furthermore, they indicated that the specific training and technology that they used to provide their services could be put in jeopardy if the city continued its cost accounting development. The case study also confirms

the theoretical prediction that the police department with the highest asset specific services was largely exempted from ABC. At the same time, organizational leaders at the executive level were hoping to use ABC to reduce their own uncertainty about the cost of providing services and to relate this information to performance information to more accurately address management and resource allocation concerns.

The cost accounting plan analysis also shows that transaction costs influence the cost accounting practices but not directly as developed by the theory in Chapter 2. Asset specificity, which is determined by the level of training and technology needed to produce a service, reduces the probability of a service being measured in the cost accounting plans. The results are just the opposite for measurement uncertainty, however. The services with high levels of measurement uncertainty are more likely to be measured in the cost accounting plans. The relationship is likely due to the refinement of the theory that organizational leaders that have services with difficult-to-measure outputs and outcomes will measure inputs and processes more specifically (Figure 5.1). Cost accounting is ideally suited to telling us more about inputs and processes. Particularly ABC can provide the input- and process-related knowledge to help organizations advance into other stages of process improvement, such as Total Quality Management (TQM). However, organizations and their subunits that provide different products and services are not likely to support these efforts when the cost accounting has developed unevenly and appears to be unfair. Uneven development of cost accounting, like the hybrid cost accounting practices of cities, does support individual management of programs and services. Future research should look at how individual programs and services that are

likely to have their costs measured in the cost accounting plans also use cost accounting data for management and resource allocation purposes.

The influence of fiscal stress on cost accounting is one of the most supported relationships in the literature on ABC. It is generally thought to encourage the development of cost accounting in organizations. The case study shows that fiscal stress is important, but it is actually the anticipation of fiscal stress that mattered to those interviewed. While the organization had the resources to develop its cost accounting, it pursued ABC so that it could avoid the worst aspects of fiscal decline. The fifth chapter, which looks at the cost accounting plans of thirty large US cities, does not support the expectation that fiscal stress was influential in impacting the cost measurement of individual services in the cost accounting plans. However, the results of the sixth chapter that looks at the cities that have a city cost accounting plan and those that do not shows that fiscal stress influences the decision in the aggregate to pursue cost accounting. Hence, while fiscal stress may not influence the service-level cost measurement, it impacts the use of cost accounting at the organizational level.

Slack resources receive mixed support in the three empirical analyses. In the case study, the participants note that slack resources were important for the ABC implementation. The two quantitative analyses do not show that slack resources influence either the services that are measured or whether the city is utilizing cost accounting. The endogenous relationship between fiscal stress and slack resources is a difficult one to resolve in the quantitative analysis but the qualitative offers support to the theoretical relationship.

Different contextual factors also importantly influence the cost accounting practices of cities. In the qualitative analysis of Chapter 2, the individual leadership of the City

Administrator was noted as being foundational to the development of ABC in the organization. As one respondent said, “If he didn’t care for it...we wouldn’t be sitting here....” The fact that he was an Administrator with the legal ability to hire and fire employees seems to be much less relevant than his referential and symbolic support of ABC. The fact that individual leadership matters so much seems to go against some of the literature that would suggest that cost accounting is a professional managerial tool (McCue, 2001; Purtell and Fossett, 2010). While professional managers may be more likely to support cost accounting generally, they do not appear to be more likely to influence individual service cost accounting (Chapter 5) or cost accounting in their organizations generally (Chapter 6). Cost accounting leadership then is one that is likely to be based on highly individualized characteristics. When individual leaders support cost accounting, it is likely to have a very significant influence on cost accounting practices.

Hierarchy is supported in both quantitative analyses of cost accounting. This is not surprising given that more hierarchical organizations have more levels of overhead and indirect costs. The case study likely does not show a relationship because it is a small and non-hierarchical organization. The findings support the relationship noted in the literature that organizational structure, and hierarchy in particular, influence cost accounting practices.

The size of the organization is not supported in any of the analyses. The size of the organization was hypothesized to be an impediment to ABC in small governments. The case study city does not support this expectation, and the quantitative analyses do not indicate a significant effect on either service-level cost accounting or an organization’s utilization of cost accounting. Hence, there is no significant relationship between size and cost accounting, and if

it is a significant factor in other studies, it may be caused by correlation with other significant factors (Rogers, 2003).

Furthermore, this study does not find any significant relationship between unions and cost accounting practices. The implementation literature of private organizations notes that unions are often key stumbling blocks for private organizations as they develop their cost accounting. In cities that were studied here, the relationship seems to be quite different. The quantitative analysis shows that organizations that operated under right-to-work laws did not have significantly different cost accounting practices (Chapter 5) or the likelihood of its utilization (Chapter 6). This operationalization of a city's relationship with its union may limit the findings; additional research on a public union's relationship to cost accounting practices may be fruitfully pursued with a more nuanced approach.

Finally, the relationship between cost accounting and performance measurement is one that is especially important to public organizations. The literature suggests that there is a strong connection between performance measurement and cost accounting in government to be used for efficiency measurement and benchmarking purposes. The qualitative analysis suggests that this is a key reason for why the organizational leaders wanted to pursue ABC. The quantitative evidence in Chapter 6 does not show a linkage between organizations that have performance measures in their budget and those that have cost accounting plans. In a sense, this is interesting given that cost accounting and performance measurement are part of the same field in business administration: managerial accounting. However, in public organizations, the need to show performance and the need to show cost information are two separate activities, Even without accurate product or service cost information, a public organization can

still benefit from performance measurement because the performance information can be used to influence the discussion of resource allocation (Moynihan, 2008). Where we do see a significant relationship between cost accounting and performance is when we look at the individual services that are used in cost accounting plans. Performance measurement in the general sections of the budget encourage more service level cost accounting. Conversely, those departments that can show the performance of their services with performance measures are less likely to have indirect cost measurement. This seems to corroborate the finding with measurement uncertainty that organizational leaders are likely to measure services more specifically if they cannot determine the outputs and outcomes easily. The relationship between cost accounting and performance in practice seems to be more dynamic than has traditionally been assumed. Further research is warranted on other cost accounting and performance measurement practices.

Taken together the empirical analyses offer a surprisingly optimistic view of public organizations' use of cost accounting. Organizations that are experiencing fiscal stress or project that they will do so are more likely to utilize cost accounting. Furthermore, cost accounting is being used strategically in organizations to measure costs and processes for services that have difficult-to-measure outputs and outcomes. It is also being used along with performance measurement to provide information to public managers. Taken together, these findings are an optimistic assessment of cost accounting's place in city government.

An important negative aspect of cost accounting that is worth noting is that it does not develop consistently in organizations, and this can raise issues of cost accounting fairness. The issue of fairness was brought up in the case study. The transaction cost analysis shows that

cost accounting is likely to develop unevenly in public organizations that provide different products and services in terms of transaction costs. Managers of public organizations need to be concerned about perceptions of fairness in cost accounting because the fairness of the system is likely to be a major concern in public organizations (Geiger, 2001). With the exception of perceptions of fairness, this analysis provides some optimism for the use of cost accounting in city government. However, the real benefit from cost accounting in a public setting may come from the cooperative use of cost accounting to provide services through the use of contracting and joint service provision. Additionally, future research should focus on how cost accounting changes the discussion and communication as has been noted in areas such as performance measurement and management (Moynihan, 2008). These future areas of research for cost accounting add another important topic to the existing body of research.

### **Cost Accounting as a Contribution to the Contracting and Governance Literature**

This research builds significantly on the contracting literature that looks at the transaction costs of contracting out public services. As is noted in Chapter 1, there is an important link between contracting and cost accounting. To be able to analyze the decision to either make or buy the service, it is important to know how much the service actually costs. This research has, therefore, indirectly contributed to the contracting literature and built upon the previous research's success of analyzing transaction costs in the decision to contract (Brown and Potoski, 2003b; Levin and Tadelis, 2010) and in the monitoring of the performance of the contract (Brown and Potoski, 2003a).

The research presented here shows that transactions costs influence cost accounting practices and that cost accounting practices have a significant relationship to performance. Figure 7.2 shows the relationships noted in the two Brown and Potoski studies (Brown and Potoski, 2003a; 2003b) that examined the relationship between transaction costs, contracting, and performance (solid black lines). Generally, Brown and Potoski found mixed support for the transaction cost influences on contracting, largely dependent upon the sector to which the government would contract the service. Asset specific services are more likely to be contracted to non-profits and less likely to be contracted to other governments or for-profit corporations, because non-profits are thought to be less likely to act opportunistically. The previous studies also note that there is generally a positive relationship between transaction costs and the likelihood of measuring the performance of a service with a performance contract. The figure also shows the relationships that are noted in the current analyses (dash lines). The current analyses shows that asset specific transaction costs are negatively related to cost accounting, and that services that were difficult to measure are more likely to be measured with an indirect cost driver in the cost accounting plans. The present analysis also shows that there is a mixed relationship between performance measurement and cost accounting depending upon the type of performance that is being measured. Organizational performance is more likely to be positively related to cost accounting development, but services that can show their performance through performance measures are less likely to be measured in the cost accounting plans.

There is also a theoretical relationship between cost accounting and contracted service delivery that is noted in the public financial management literature (Figure 7.2 dotted line).



Cost accounting is useful (even if it is not a perfect tool) to determine when a service can be cost effectively contracted out. The present analysis is unable to distinguish how a service was provided by a government. This is a limitation of the current study but additional research on this topic would be a major advancement of financial management theory. Also, governance and the provision of contracted services through methods such as inter-local agreements are increasingly being discussed as ways to make the governance of metropolitan areas more efficient and effective (Leland and Thurmaier, 2010) and scholars are aware of the need for more research on cost accounting methods in these situations (Simon, 1962).

[FIGURE 7.2]

### **Toward a Theory of Governance and Financial Management**

A major reason for the present analyses on transaction costs' effects on cost accounting came from the assertion that public financial management and transaction costs were inextricably linked (Bartle, 2004). Furthermore, the transaction cost scholars have long indicated that transaction costs should have a strong relationship with accounting and cost accounting systems (Tadelis and Williamson, 2012; Williamson, 1985) even if it is not often tested empirically (Macher and Richman, 2008). The previous analyses have largely tested and verified that transaction costs are related to cost accounting and have built upon previous work that looks at whether transaction costs influence the contract service choice. In this last section, a model is developed that combines the financial management tools that are supported in the literature and how they relate to the governance service provision choices for

providing public services. Building upon the previous work and Williamson's (1985) concepts of governance, the theoretical model of transaction cost and governance financial management is presented below (Figure 7.3)

[FIGURE 7.3]

The model is a refinement and elaboration upon the model previously presented that looked at how transaction costs, performance, cost accounting, and contracting related (Figure 7.2). All of the topics (squares) within each concept (circles) relate to the other topics within the concept. For example, asset specificity and measurement uncertainty should be related to each other to create the theoretical concept of transaction costs. Cost accounting, performance measurement, financial accounting, and budget process should all be related to each other as major categories of public financial management<sup>27</sup>. Likewise, public services are provided under a broad theory of governance (Lynn et al., 2002; Williamson, 1985) to include private service provision, intergovernmental provision, non-profit provision, provision by semi-public organizations, and by direct governmental provision. The transaction cost, financial management, and governance concepts all relate to one another. It is primarily to the relationships between concepts that general public administration will likely be concerned. However, the previous analysis and the literature on transaction costs suggest that the development of public financial management topics such as cost accounting will significantly influence the governance arrangements that develop. To the extent that we believe that

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<sup>27</sup> This is not an inclusive list of all public financial management topics. The topics included in this category are those topics that have a literature that suggests that they are related to cost accounting.

contracted governance is likely to be an enduring aspect of public service provision, attention should be devoted to how these relationships are financially managed, in addition to understanding whether the service is contracted or provided by the government.

While the previous model (Figure 7.2) suggests that there is likely to be a uniformly positive relationship between cost accounting and contracted service provision, the financial management model of governance suggests that organizational cost accounting may not be related positively to all contracted service provision. The present analysis shows that asset specificity is negatively related to the indirect cost measurement of a service and measurement uncertainty is positively related to indirect cost measurement of the service. Given these characteristics, organizational cost accounting may be either positively or negatively related to service contracting based upon whether the service is actually measured in the cost accounting plan. Furthermore, there may be concerns about a contracting partner acting opportunistically to develop preferential cost accounting. Brown and Potoski showed that services that have asset specific training and technological requirements are positively related to non-profit contracts but negatively related to for-profit and other levels of government because of concerns about the contract partner behaving opportunistically once the service is provided via the contract. Theoretical and empirical investigations should be devoted to clarifying the financial management of governance based upon whether a contracting partner is a for-profit or competing level of government, or a non-profit or semi-public organization; different organization types may have different incentives to act opportunistically with the cost accounting of a contracted service. In spite of the theoretical concerns raised, there is almost no academic literature that has looked at the financial management of these contracted

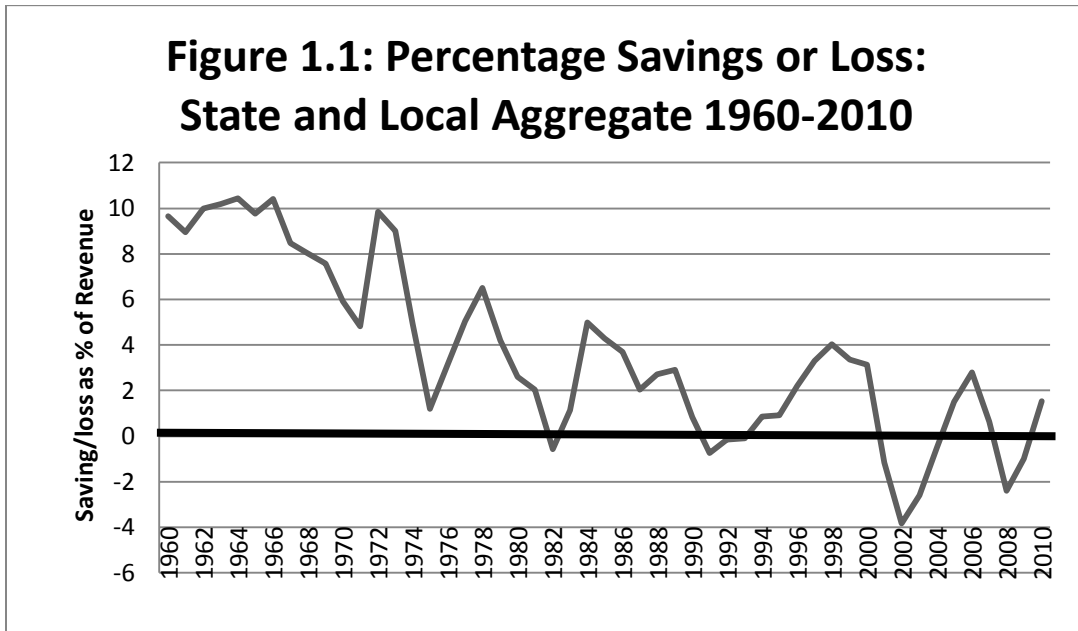
services and how city governments and their partners agree upon the price to be reimbursed for the service. Furthermore, the decision to contract out a service may precede the cost accounting decision, which leads an organization to develop cost accounting<sup>28</sup>. This situation may have other repercussions on how the cost accounting is developed. Future research should address this paucity of research.

Transaction costs and public financial management topics like cost accounting are important to financial management of governance. The current literature of advanced cost accounting, like ABC, suggests that cost accounting is primarily developed in public organizations because of fiscal stress. At the same time, current cost accounting practice may offer limited means for reducing the cost of service provided. It has the potential to help manage overhead costs, as suggested in Chapter 3, but cost accounting by itself would not be enough to influence resource allocation decisions. Policymakers and managers have to consider the level of service demanded and provided, and whether services can be provided in different ways, such as through contracting with for-profit providers or by contracting with another type of public organization that can be more cost-effective. Hence, there is great potential to integrate cost accounting research with other public administration and governance research. This research is an attempt to clarify cost accounting practices in US cities and to develop an empirical research agenda within a broader theory of transaction costs and governance.

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<sup>28</sup> It is also to be noted that the topics of financial management such as cost accounting and performance could be correlated but unrelated. This seems unlikely, however, because cost accounting is designed for the purpose of making the decision of whether to make or buy a service. This argument, while theoretically possible, is not likely a possibility.

## Illustrations



<b>Table 1.1: State and Local Gov. Fiscal Stress from 1960 – 2010</b>	
Decade	Years of Aggregate Deficits
1960	0
1970	0
1980	1
1990	3
2000	6

Source: BEA NIPA 2011

**Figure 1.2: State & Local Surplus (Deficit)  
as % GDP - Source GAO 2011**

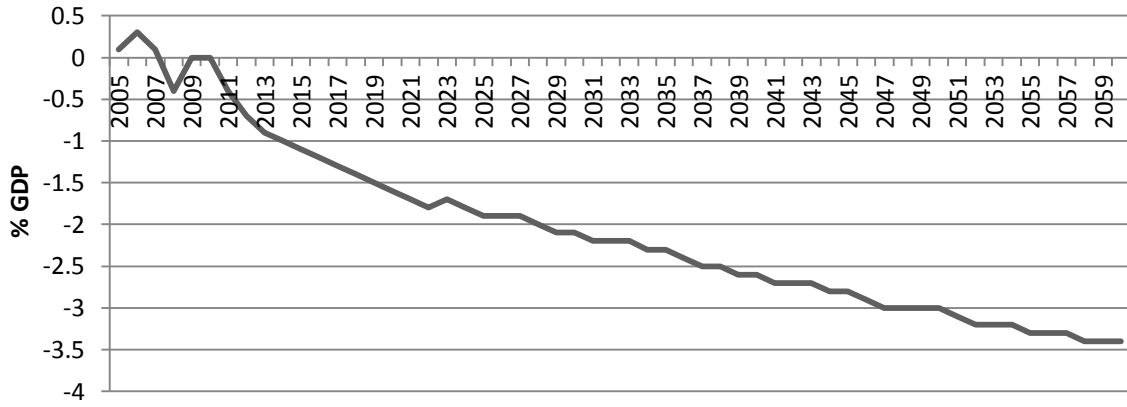


Figure 2.1: Positive Accountancy Model

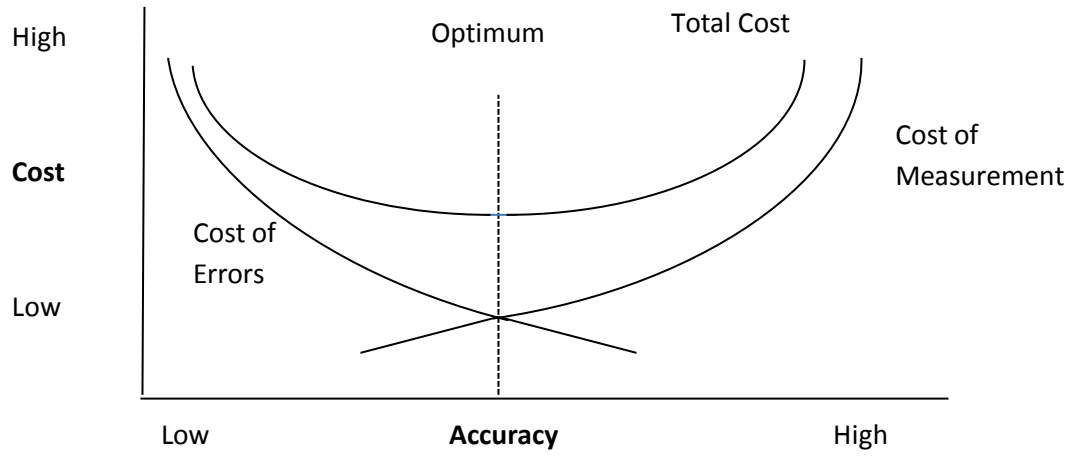




Figure 2.2: Different Cost System Preferences by Principal and Agent

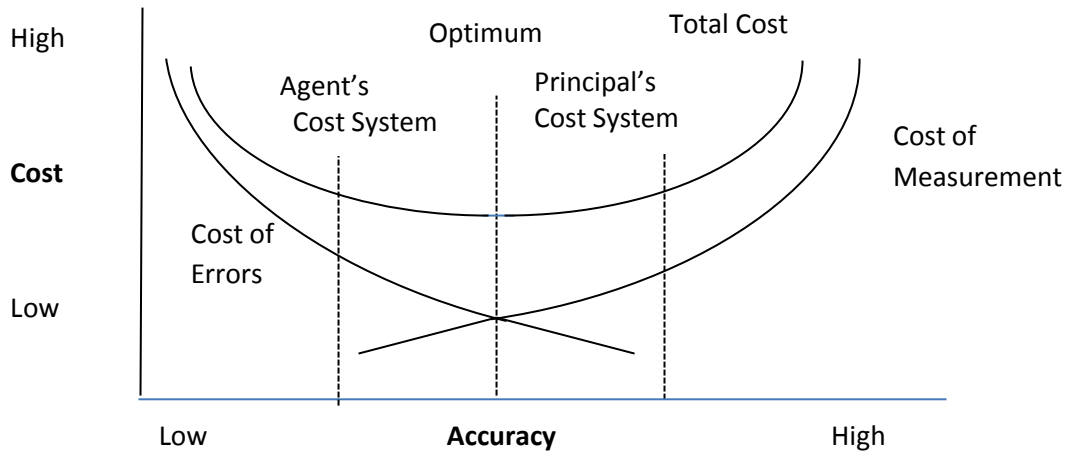


Figure 2.3: Implemented Cost System Differs from Optimal System

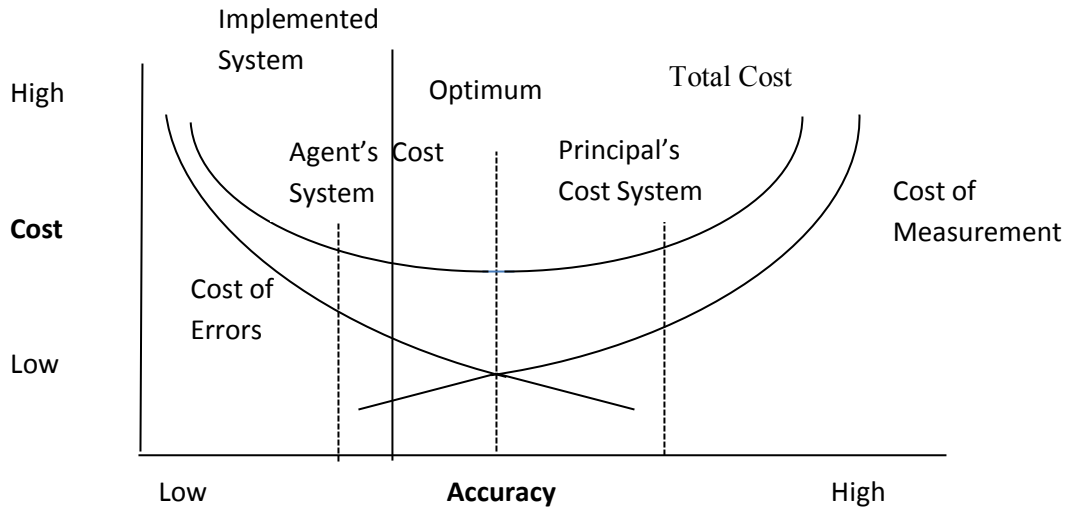
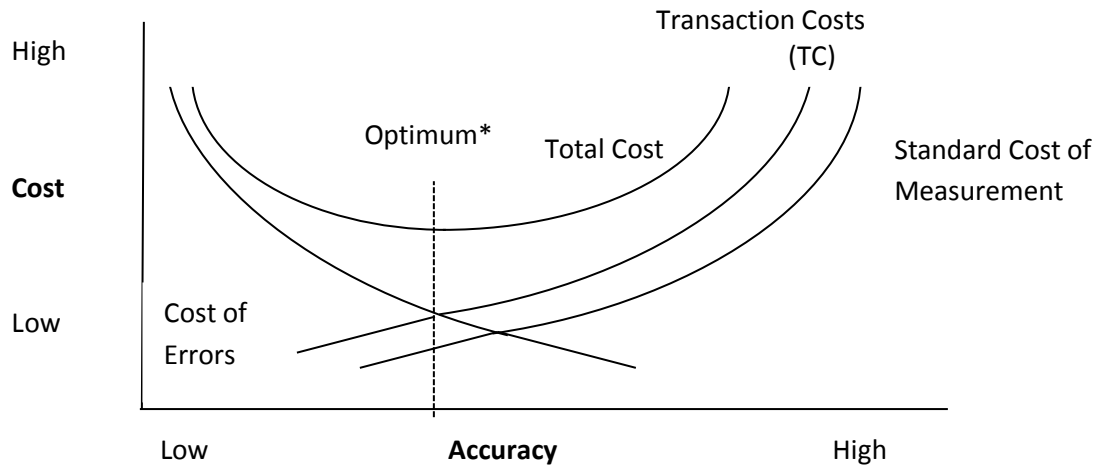
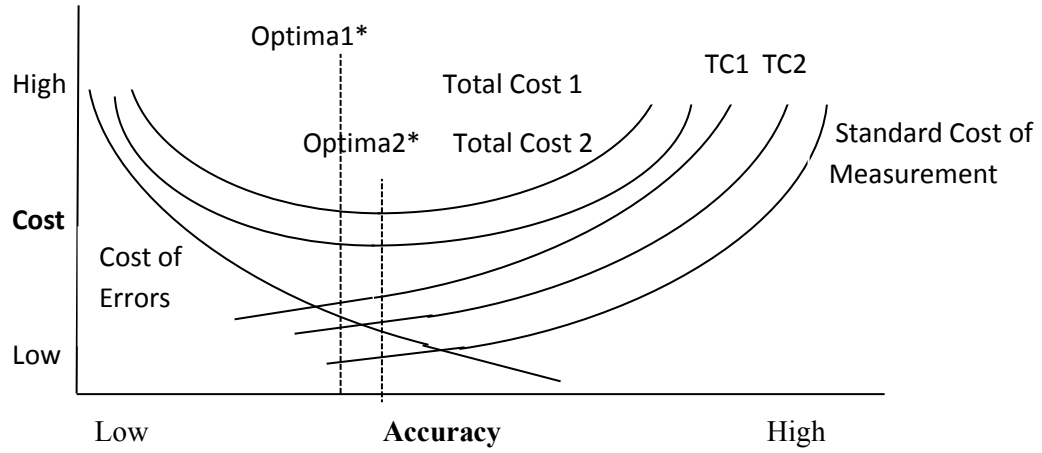


Figure 2.4: Transaction Costs Reduce the Optimal Level of Cost Accounting



\*Indicates that the optimum includes transactions costs

Figure 2.5: Multiple Transaction Costs and Multiple Optima



\*Indicates that the optimum includes transactions costs

Figure 2.6: Transaction Cost of Uncertainty from Cost Measurement

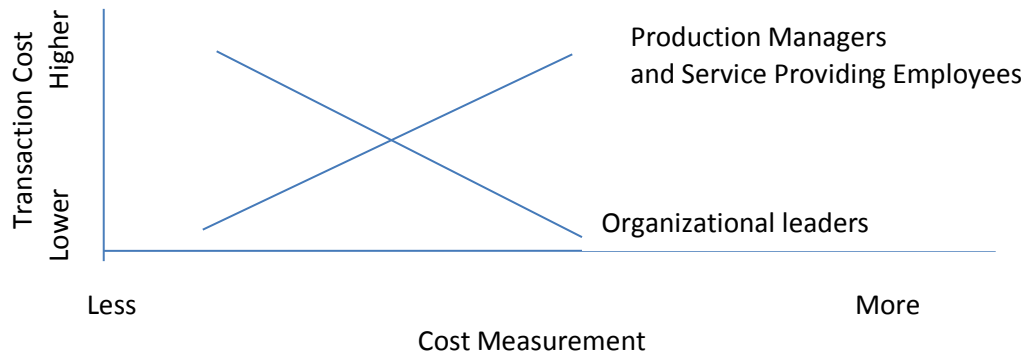
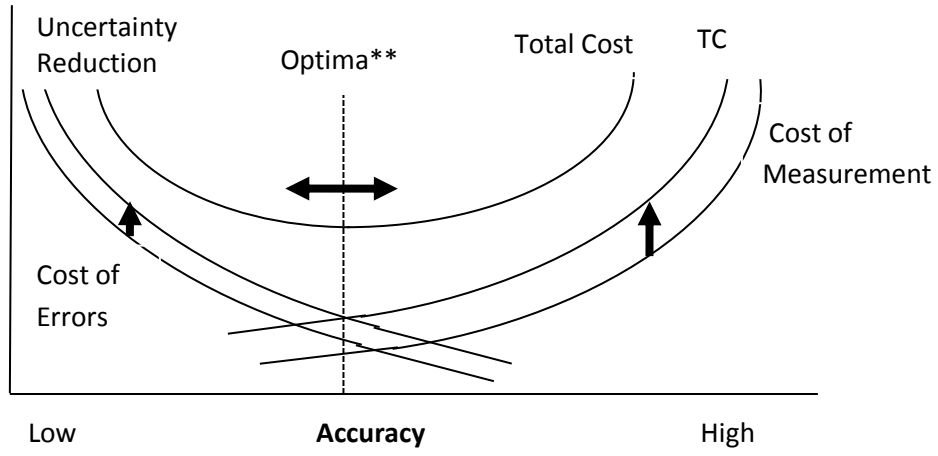
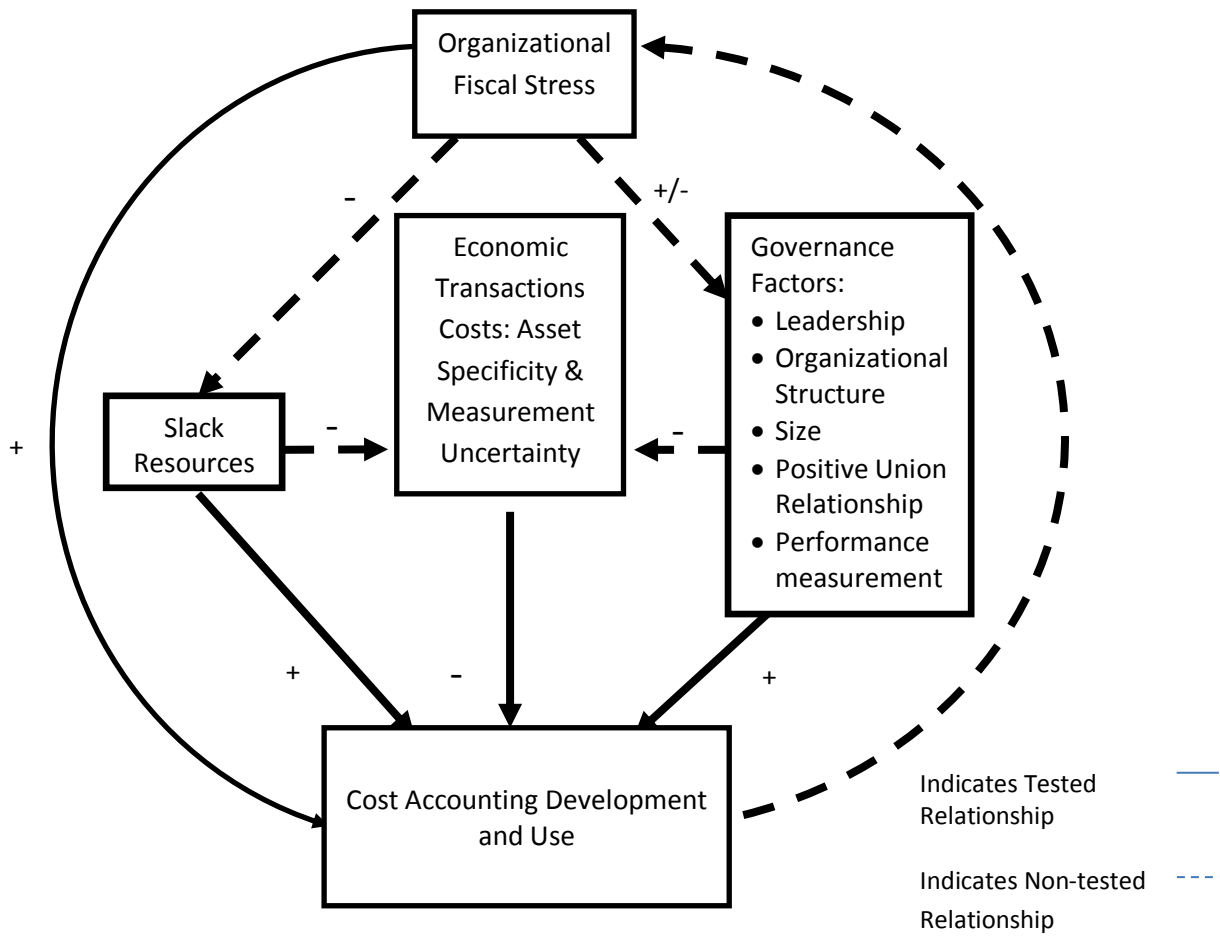


Figure 2.7: Transaction Cost and Uncertainty Reduction Affect the Optima



\*\*Indicates that the optimum includes transactions costs and upper management uncertainty reduction

Figure 2.8: Theoretical model of cost accounting use at the service level



**Figure 3.1: Traditional Cost Accounting Example**

Budget	
Administration and Council	100,000
IT	80,000
PD1	220,000
PD2	150,000

Traditional Cost Accounting		
Allocation Base Summary		
Overhead Department	Base	Source
Administration and Council	FTE	Budget
IT	% of Budget	Budget

Allocation - Administration and Council						
Department	Cost	Allocation Base Units	Allocation		Total Allocation	Total Cost
			Step 1	Step 2		
Administration and Council	100,000		-100,000		-100,000	0
IT	80,000	1	3,704	-3,704	0	80,000
PD1	220,000	16	59,259	2279	61,538	281,538
PD2	150,000	10	37,037	1425	38,462	188,462
Total	550,000	27	0	0	0	550,000

Allocation - IT						
Department	Cost	Allocation Base Units	Allocation		Total Allocation	Total Cost
			Step 1	Step 2		
Administration and Council	0	100,000	17,021	-17,021	0	0
IT	80,000		-80,000		-80,000	0
PD1	281,538	220,000	37,447	10121	47,568	329,106
PD2	188,462	150,000	25,532	6901	32,432	220,894
Total	550,000	470,000	0	0	0	550,000

2.) Generic Drivers

3.) Departments are cost pools and receive costs

3.) Final costs spread among receiving departments



**Figure 3.2: Activity Based Cost Example**

Overhead Department	Drivers	Source
Administration	Time	Payroll System
Council	50% Self & 50% Agenda Items	Council Minutes
IT	Computers	IT Records

1.) Specific cost drivers

2.) Hierarchy of cost

3.) Activities are cost pools and activities receive cost

Activity - Administration

Activity	Cost	Driver units	Allocation			Total Allocation	Total Cost
			Step 1	Step 2			
Administration	80,000		-80,000		-80,000	0	
Legislature	20,000	384	8,000	-8,000	0	20,000	
IT	80,000	384	8,000	889	8,889	88,889	
PD1 Activity/Service	220,000	1728	36,000	4,000	40,000	260,000	
PD2 Activity/Service	150,000	1344	28,000	3,111	31,111	181,111	
<b>Total</b>	<b>550,000</b>	<b>3840</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>550000</b>	

Driver: Administrative Time  
Source: Payroll System

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Activity - Council

Activity	Cost	Driver units	Allocation			Total Allocation	Total Cost
			Step 1	Step 2			
Administration	0	1	357	-357	0	0	
Legislature	20,000		-10,000		-10,000	10,000	
IT	88,889	2	714	26	741	89,630	
PD1 Activity/Service	260,000	5	1,786	66	1,852	261,852	
PD2 Activity/Service	181,111	20	7,143	265	7,407	188,519	
<b>Total</b>	<b>550,000</b>	<b>28</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>550000</b>	

Driver: Agenda Items  
Source: Council Minutes

Note: 50% of Legislative cost is allocated, other 50% allocated to self

Activity - IT

Activity	Cost	Driver units	Allocation			Total Allocation	Total Cost
			Step 1	Step 2			
Administration	0	4	21,089	-21,089	0	0	
Legislature	10,000	1	5,272	-5,272	0	10,000	
IT	89,630		-89,630		-89,630	0	
PD1 Activity/Service	261,852	2	10,545	4,394	14,938	276,790	
PD2 Activity/Service	188,519	10	52,723	21,968	74,691	263,210	
<b>Total</b>	<b>550,000</b>	<b>17</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>550000</b>	

Driver: Agenda Items  
Source: Council Minutes

4.) Final costs related to resource consumption

**Figure 3.3: Hybrid Cost System Example**

Driver Summary		
Overhead Department	Base	Source
Administration	FTE	Budget
Council	Agenda Items	Council Minutes
IT	Computers	IT Records

1.) Mix of general and specific drivers

Activity - Administration

Activity	Cost	Driver units	Allocation			Total Allocation	Total Cost
			Step 1	Step 2			
Administration	80,000		80,000		-80,000	0	
Council	20,000				0	20,000	
IT	80,000	1	2,963	-2,963	0	80,000	
PD1	220,000	16	47,407	1,823	49,231	269,231	
PD2	150,000	10	29,630	1,140	30,769	180,769	
<b>Total</b>	<b>550,000</b>	<b>27</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>550,000</b>	

Driver: FTE  
Source: Budget

2.) Allocates indirect resources to Departments and Activities

Activity - Council

Activity	Cost	Driver units	Allocation			Total Allocation	Total Cost
			Step 1	Step 2			
Administration	0	1	714	-714	0	0	
Council	20,000		20,000		-20,000	0	
IT	80,000	2	1,429	-1,429	0	80,000	
PD1	269,231	5	3,571	429	4,000	273,231	
PD2	180,769	20	14,286	1,714	16,000	196,769	
<b>Total</b>	<b>550,000</b>	<b>28</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>550,000</b>	

Driver: Agenda Items  
Source: Council Minutes

Activity - IT

Activity	Cost	Driver units	Allocation			Total Allocation	Total Cost
			Step 1	Step 2			
Administration	0	4	18,824	-18,824	0	0	
Council	0	1	4,706	-4,706	0	0	
IT	80,000		80,000		-80,000	0	
PD1	273,231	2	9,412	3,922	13,333	286,564	
PD2	196,769	10	47,059	19,608	66,667	263,436	
<b>Total</b>	<b>550,000</b>	<b>17</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>550,000</b>	

3.) Total costs are more accurate than traditional cost systems but not as unambiguous as ABC.

<b>Table 3.1: Key Attributes of Cost System Difference</b>			
Attributes	System		
	Traditional	ABC	Hybrid
Drivers	Generic	Specific	Specific and generic
Activity Analysis	None	All departments	Some departments
Indirect resources counted in	Only overhead departments	All overhead and service departments	All overhead and some service departments
Reason for the system	Compliance and reporting; to provide information on the average cost of services	Continuous improvement; reduce costs of individual services	General cost management such as variance analysis; reduce cost of department or cost center

<b>Table 3.2: Expanded Cost System Comparisons</b>				
Attributes	System			
	Traditional Cost Accounting <sup>1</sup>	Original ABC <sup>1,2</sup>	Pull or Time Driven ABC <sup>2</sup>	Hybrid Cost Accounting
Overhead or indirect costs are ...	Allocated based on few and general cost drivers	Attributed, based on more cost drivers	Attributed, based on more cost drivers	Allocated based on intermediate and mixed cost drivers
Allocation bases or cost drivers are	General such as budget amount or volume based drivers such as labor or machine hours	Use mostly specific cost drivers such as outputs and distinct process characteristics	Time is major driver but also other specific cost drivers and distinct process characteristics	Mix of general and specific cost drivers
Costs allocated to...	Cost Centers (Departments), and then Products, Services, and Customers	Activities, Products, Services, Customers or Cost center	Activities, Products, and Services, and then Cost Centers and Customers	Mostly to cost centers but some products or services allocated indirect costs
The number of bases or cost drivers are...	Few	Very many	More than traditional but less than original ABC	Intermediate
Final product costs are...	Specific but less accurate (may even be inaccurate)	Approximate but more accurate	Approximate but more accurate	More accurate than standard cost accounting and less than ABC
Process of developing is...	1st - allocate overhead to cost centers (Step down or reciprocal method for multiple overhead costs), 2nd allocate indirect costs to cost objects using allocation rate	1st - Analyze activities and their relationship to indirect resource consumption, 2nd - determine cost drivers for indirect resource consumption, 3rd - apply cost drivers to activities to develop activity cost model and	1st - determine process time for activities and relationship to resources; 2nd - determine capacity cost for activities; 3rd - roll up to products, services, customers and departments	1st - allocate overhead to cost centers (Step down or reciprocal method for multiple overhead costs), 2nd allocate indirect costs to cost objects using allocation rate

		roll up costs for products, services, customers, and departments		
Unused capacity or downtime is...	Factored into cost of cost object	Factored into cost of cost object	Most often explicitly accounted for and separated in the model	Factored into cost of cost object
Who develops the cost estimates...	Accounting department	Accounting department with significant department management involvement	Accounting department with less management involvement relative to original ABC	Accounting department with less management involvement relative to original ABC
The process of developing costs is characterized often as ...	Technical, allocation bases are basic, not open to interpretation, and can be collected by accounting staff	Political, staff involvement and perception is required, cost drivers and hierarchy of costs require judgment and are open to disagreement	Less political but not completely technical, smaller data requirements and less employees involved in the process	Unknown
The cost for the system is...	Low initially and low sustaining	High initially and high sustaining	High initially, lower sustaining	Medium initially and medium sustaining
Data requirements are	Low	Very high	High	Medium
Technology requirements	Few	Personal Computers; specialized ABC software or spreadsheets	Enterprise System especially useful but can be done on PC	Personal Computers and Spreadsheets
The purpose of the system is...	Rough estimation of costs, compliance with external entities ie granting and	Specific estimate of cost for determining products or services mix, drive process improvements	Same as ABC but rough Time Driven ABC models can be used to simulate scenarios for what-if analysis,	More accurate estimation of costs than traditional cost accounting, compliance, rate

	auditing entities	such as Kaizen Costing, Lean Six Sigma, Benchmarking initiatives and make or buy decisions	mergers and acquisitions due diligence, and supply chain management	setting, and overhead variance analysis
The system is especially useful for...	Basic processes with low overhead and little product or service variation	High overhead, significant product or service variation and/or management that wants to use improvement processes above	High overhead, service variation and/or management that wants to use improvement processes above; for stable processes it can be used for activity based budgeting	Processes with some overhead and some product or service variation
1: Distinctions between Traditional Cost Accounting and Original ABC is based on discussion in Drury 2004				
2: Distinctions between Original ABC and Time Driven (Pull) ABC is based on discussion in Kaplan and Anderson 2007				
3: Generalizations about hybrid systems relative to Traditional Cost Accounting and Original ABC based upon discussion of hybrid systems in Horngren et al 2012, Geiger 2011, and analysis of local government cost plans				

Level or Position	Number of Interviews
Organization Leaders	2
Department Managers	4
Cost System Analysts	2

Figure 4.1: Organizational Hierarchy

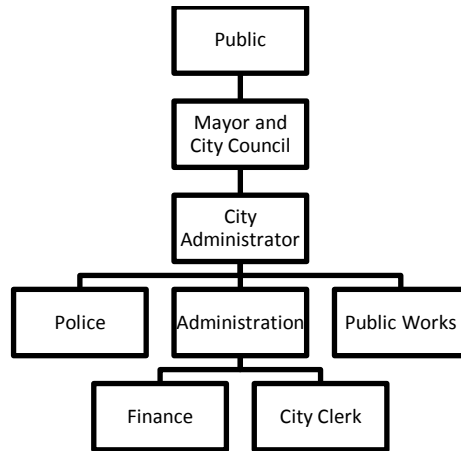




Figure 4.2

2011 Job Code Summary  
by Total Compensation (salary + benefits)

CITY SERVICE	TOTAL WAGE + BENEFIT COST	CITY SERVICE	TOTAL WAGE + BENEFIT COST
1 PD - Patrol	\$ 2,424,480	56 161 - Business License	\$ 18,133
2 PD - Investigations	\$ 552,598	57 163 - Rental Housing Program	\$ 15,494
3 PD - Staff Services (dispatch)	\$ 447,195	58 521 - Codes Inspections	\$ 12,651
4 202 - Public Works Coordination	\$ 319,521	59 302 - Police Department Coordination	\$ 11,862
5 PD - Traffic Unit	\$ 318,319	60 515 - Building Permit Plan Review	\$ 11,168
6 231 - Parks Operations & Maintenance	\$ 315,937	61 113 - Mail Processing	\$ 9,250
7 410 - Court Services	\$ 286,623	62 234 - Tree Chipping	\$ 8,722
8 620 - Pool	\$ 257,467	63 12 - Municipal Foundation	\$ 8,695
9 PD - Administration	\$ 243,898	64 164 - Admin/Retail Licensing	\$ 7,486
10 PD - Police Records/Prop. Mgmt	\$ 161,803	65 531 - Economic Development - NEW	\$ 6,823
11 213 - Street Repair & Maint.	\$ 155,843	66 232 - Fountain Repair & Maint.	\$ 6,646
12 204 - Vehicle Maintenance	\$ 148,899	67 14 - Sister City	\$ 6,526
13 PD - Special Investigations Unit	\$ 143,431	68 114 - Insurance/Risk Management	\$ 6,005
14 122 - Accounting/Financial Reporting	\$ 132,795	69 611 - Facility Reservations	\$ 5,991
15 2 - Mayor/Council Support	\$ 121,347	70 11 - Environmental Committee	\$ 5,885
16 216 - Drainage Ops & Maint.	\$ 118,082	71 630 - Park Master Planning	\$ 5,556
17 PD - Prof. Standards (training coord.)	\$ 108,472	72 City Treasurer	\$ 5,511
18 PD - Animal Control	\$ 98,845	73 151 - Legal Coordination	\$ 4,684
19 32 - Public Assistance	\$ 84,076	74 23 - Legislative Coordination	\$ 4,515
20 513 - Building Inspections	\$ 83,662	75 8 - Park & Rec Committee	\$ 4,355
21 110 - Records/Contract Mgmt	\$ 83,021	76 150 - Franchise Agreements/Utilities	\$ 3,884
22 130 - Professional Development	\$ 79,762	77 560 - Solid Waste Program	\$ 3,632
23 221 - Bldg Ops & Maintenance	\$ 79,729	78 530 - Economic Development - existing	\$ 3,537
24 211 - Snow & Ice Control	\$ 79,301	79 533 - Community Improvement Districts	\$ 3,526
25 610 - Park & Rec Programming	\$ 73,149	80 22 - NEJC Chamber	\$ 3,390
26 230 - Island Maintenance	\$ 70,597	81 523 - Rental Housing Inspect.	\$ 3,278
27 132 - Compensation/Benefits - HR	\$ 65,137	82 243 - Vandalism Clean-up	\$ 3,196
28 121 - Budget Preparation	\$ 62,831	83 514 - Exterior Grant Program	\$ 3,149
29 PD - Off-Duty Contractual	\$ 62,450	84 303 - Police Pension Administration	\$ 2,908
30 PD - Crime Prevention	\$ 62,366	85 551 - Building Plan Review	\$ 2,789
31 PD - DARE Program	\$ 62,266	86 220 - Building Maintenance	\$ 2,714
32 210 - Capital Projects	\$ 62,255	87 412 - Court State Reporting	\$ 2,575
33 233 - Tree Care Program	\$ 58,350	88 115 - Emergency Management	\$ 2,564
34 133 - Management/Supervision	\$ 57,279	89 221 - Bldg Op & Maintenance	\$ 2,561
35 120 - Acct. Payable/Purchasing	\$ 46,648	90 18 - Misc. Community Events	\$ 2,177
36 PD - Crossing Guards	\$ 45,098	91 17 - Tree Board	\$ 2,127
37 212 - Street Sweeping/Clean-Up	\$ 44,914	92 522 - Codes Assistance	\$ 1,842
38 140 - IT	\$ 39,883	93 34 - Homes Association Coordination	\$ 1,661
39 520 - Codes Admin	\$ 38,617	94 35 - Community Relations	\$ 1,598
40 33 - Public Relations	\$ 35,508	95 24 - SMSD Coordination	\$ 1,480
41 160 - Animal License/Renumeration	\$ 34,441	96 36 - Village Volunteers	\$ 1,336
42 550 - Planning Services	\$ 34,147	97 9 - Island Committee	\$ 826
43 203 - Work Order Processing	\$ 33,926	98 31 - Human Services	\$ 766
44 240 - Traffic Sign Maintenance	\$ 33,776	99 214 - Bridge Repair & Maint.	\$ 717
45 510 - Building Codes Admin	\$ 30,699	100 632 - Trails & Bike Lanes	\$ 368
46 411 - Court Ticket Entry	\$ 26,747	101 19 - 75th St Committee	\$ 290
47 131 - Employee Relations	\$ 26,020	102 570 - Public Transportation	\$ 191
48 15 - Jazz Fest	\$ 24,539	103 552 - Long Range Planning	\$ 136
49 540 - Environmental Initiatives	\$ 23,830	104 631 - Open Space Planning	\$ 77
50 511 - Building Inspect - Permits	\$ 23,645	105 16 - Homes Assoc. Committee	\$ 55
51 215 - Sidewalk Repair & Maint.	\$ 21,157	106 241 - Traffic Signals	\$ 39
52 21 - Regional Coordination	\$ 20,801	107 413 - Court Legal Coordination	\$ 35
53 512 - Building Inspect - Scheduling	\$ 19,710	108 20 - Inspections for Other Cities	\$ 23
54 10 - Arts Council/Gallery	\$ 18,773	<b>Grand Total</b>	<b>\$ 8,348,385</b>
55 13 - Villagefest	\$ 18,315		

\*NOTE: Police Department does not utilize job codes so all staff time is allocated to one of thirteen programs.

**Table 5.1: City Characteristics**

2010 - Population*	Sample Count	Sample %	Populatio n %	Region**	Sample Count	Sample %	Populatio n %
100,000 - 200,000	13	43.33%	60.52%	Midwest Northeast	4	13.33%	15.50%
200,000 - 500,000	10	33.33%	27.31%		2	6.67%	10.33%
500,000- 1,000,000	5	16.67%	8.86%	South	13	43.33%	35.06%
1,000,000 +	2	6.67%	3.32%	West	11	36.67%	39.11%
		100.00				100.00	
Total	30	%	100.00%	Total	30	%	100.00%

*\*Population difference is not significant based upon t-test of the means*

*\*\*Region difference is not significant based upon chi-squared tests*

**Table 5.2: Variable Descriptive Statistics**

<u>Variable</u>	<u>n</u>	<u>mean</u>	<u>sd</u>	<u>median</u>	<u>min</u>	<u>max</u>
Asset Specificity	1122	3.05	0.64	3.06	1.75	4.22
Service Measurability	1122	2.61	0.51	2.57	1.53	4.29
Departmental Expenditure	1122	27092	79853	5463	3	816123
Departmental Performance*	1122	0.81	0.39	1	0	1
Manager*	1122	0.69	0.46	1	0	1
Organizational Hierarchy	1122	3.11	0.83	3	2	5
Personnel	1122	3688	3400	2333	731	15038
Organizational Performance Measurement*	1122	0.68	0.47	1	0	1
Tax Limit*	1122	0.61	0.49	1	0	1
Right-to-work*	1122	0.64	0.48	1	0	1
Government Slack	1122	0.08	0.09	0.07	0.13	0.26

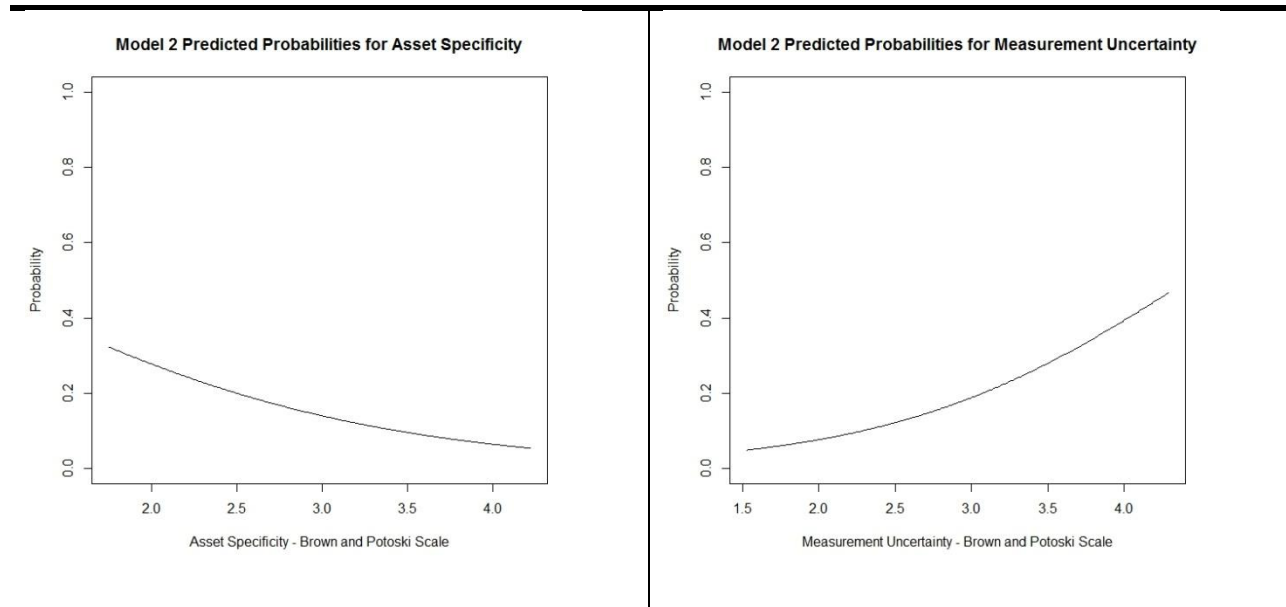
\*dichotomous variables

**Table 5.3: Determinants of Cost Accounting at the Service Level**

	Model 1			Model 2			Model 3		
Determinants	<u>b</u>			<u>b</u>			<u>b</u>		
Asset Specificity	-0.86	(-5.58)	**	-0.86	(-5.58)	**	-0.85	(-5.57)	**
Outcome									
Measurement									
Uncertainty	1.03	(6.02)	**	1.03	(6.02)	**	1.03	(6.02)	**
Expenditure	-0.01	(-0.01)		-0.01	(-0.01)		-0.09	(-0.07)	
Department									
Performance	-0.68	(-2.25)	*	-0.68	(-2.3)	*	-0.63	(-2.11)	*
Organizational									
Hierarchy	0.29	(1.08)		0.31	(1.77)	.	-	-	
Manager	0.05	(0.11)		-	-		0.42	(1.38)	
Personnel	-0.04	(-0.83)		-0.04	(-0.86)		-0.03	(-0.72)	
Organizational									
Performance									
Measures	0.80	(2.1)	*	0.81	(2.11)	*	0.79	(2.05)	*
Tax Limit	0.16	(0.53)		0.15	(0.52)		0.25	(0.88)	
Right to work	-0.24	(-0.77)		-0.25	(-0.78)		-0.24	(-0.76)	
Government									
Slack	1.27	(0.77)		1.24	(0.76)		1.75	(1.07)	
Int.	-2.78	(-3.41)	**	-2.80	(-3.53)	**	-2.29	(-3.38)	**
Random effects:									
Groups	Variance			Variance			Variance		
City	0.29			0.29			0.3		
Number of observations: 1122, groups: 30									
AIC	935.50			933.50			934.70		
log-likelihood	-454.8			-454.8			-455.3		

\*\* $(Pr|z|>0)<.01$ , \* $(Pr|z|>0)<.05$ , . $(Pr|z|>0)<.1$ ,

Figure 5.2: Predicted Probabilities



**TABLE 6.1**  
Descriptive Statistics

Variables	No	Yes	Mean	SD	Min	Max
<i>Dependent Variable</i>						
Cost Plan	27	51	-	-	-	-
<i>Independent Variables</i>						
Grant funding % of Total Expenditures	-	-	0.18	0.13	0.01	0.75
Business-like activity % of Total Expenditures	-	-	0.31	0.2	0	0.99
Fund Balance % of Total Expenditure	-	-	0.08	0.11	-0.24	0.48
Performance Measures	25	53	-	-	-	-
<i>Control Variables</i>						
Total Expenditures (in thousands)	-	-	727393	1144727	80390	8528286
Population (in thousands)	-	-	323.31	403.89	102.43	2695.6
Hierarchy	-	-	3.03	0.76	1	5
Manager	24	54	-	-	-	-
Tax Limit	35	43	-	-	-	-
Right to work	43	35	-	-	-	-

Note: 78 Observations

**TABLE 6.2**  
Determinants of Cost Accounting

Variables	Estimate	z-score	p	
Grant funding % of Total Expenditures	-2.07	-0.958	0.33815	
Business-like activity % of Total Expenditures	1.59	0.997	0.31864	
Fund Balance % of Total Expenditure	-12.96	-2.78	0.00543	**
Performance Measures	-0.37	-0.569	0.56927	
Total Expenditures (in thousands)	0.00	-0.434	0.66397	
Population (in thousands)	0.00	0.946	0.34416	
Hierarchy	1.15	2.007	0.0447	*
Manager	-1.27	-1.266	0.20563	
Tax Limit	0.67	1.056	0.29104	
Right to work	1.10	1.555	0.11991	
Intercept	-1.97	-1.278	0.20124	
N	77			
AIC	98.53			

\*p≤.05, \*\*p≤.01

**FIGURE 6.1**

Predicted Probabilities of Cost Accounting with Varying Fund Balance

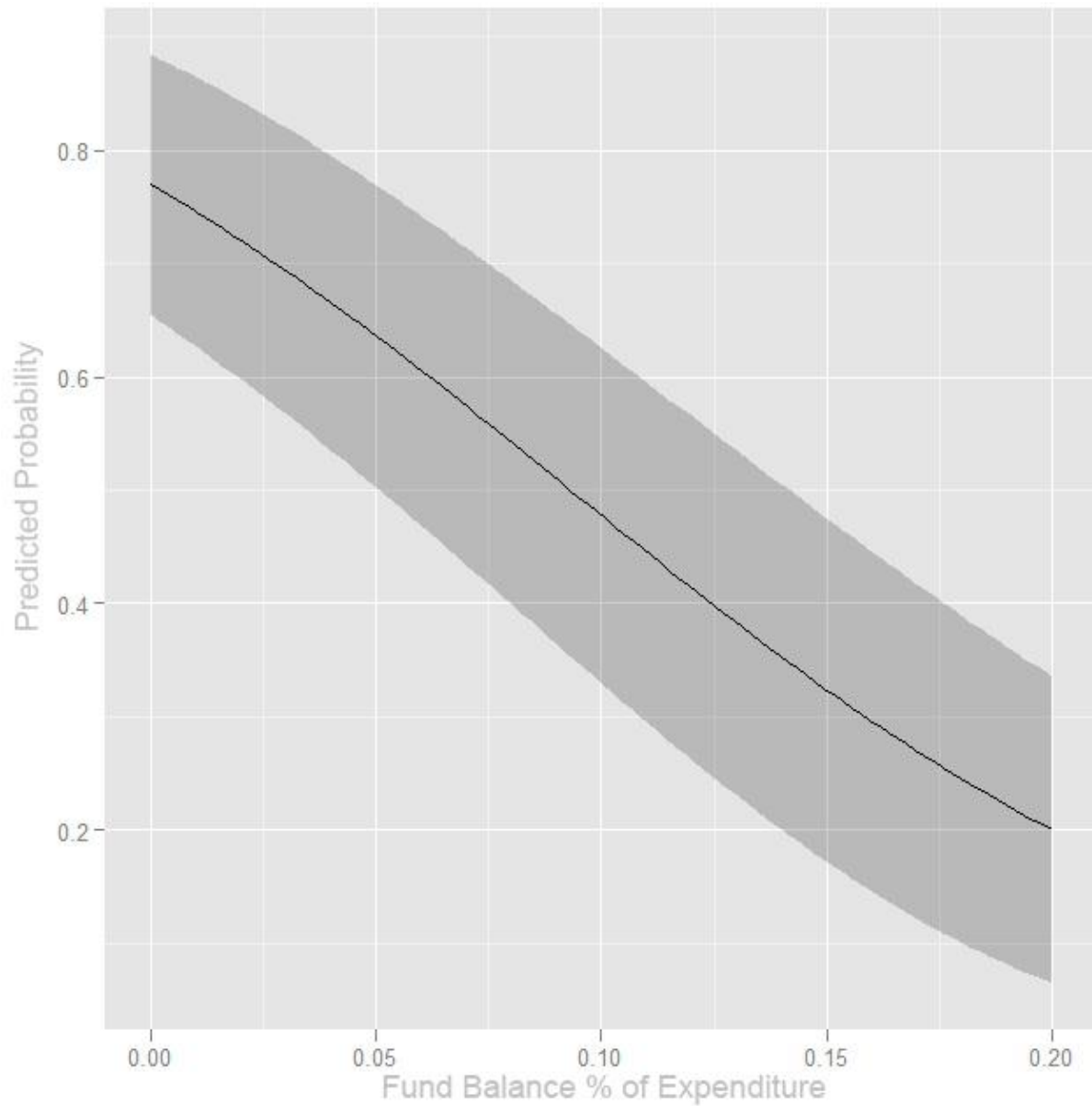




Figure 7.1: Final Model

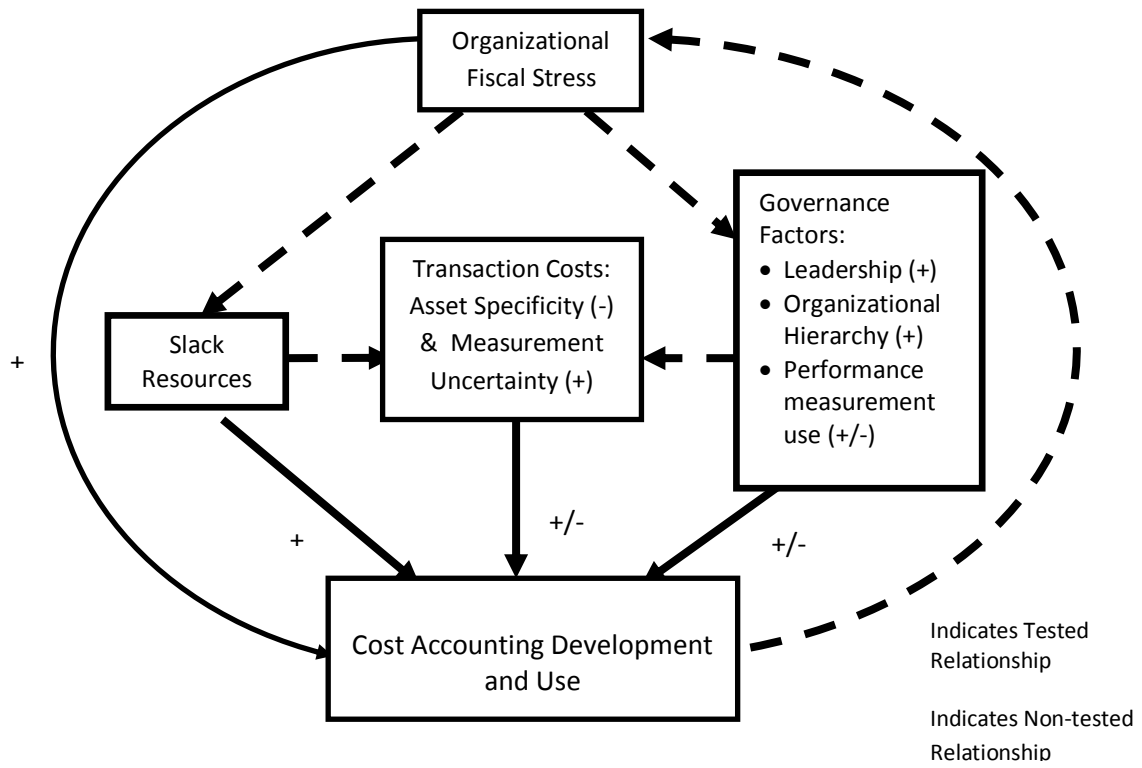


Figure 7.2: Transaction Cost, Cost Accounting, and Performance Measurement

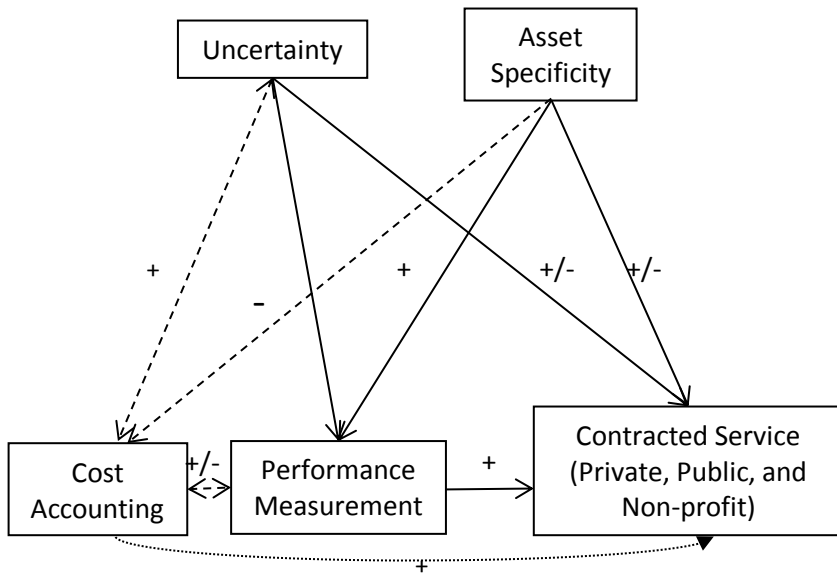
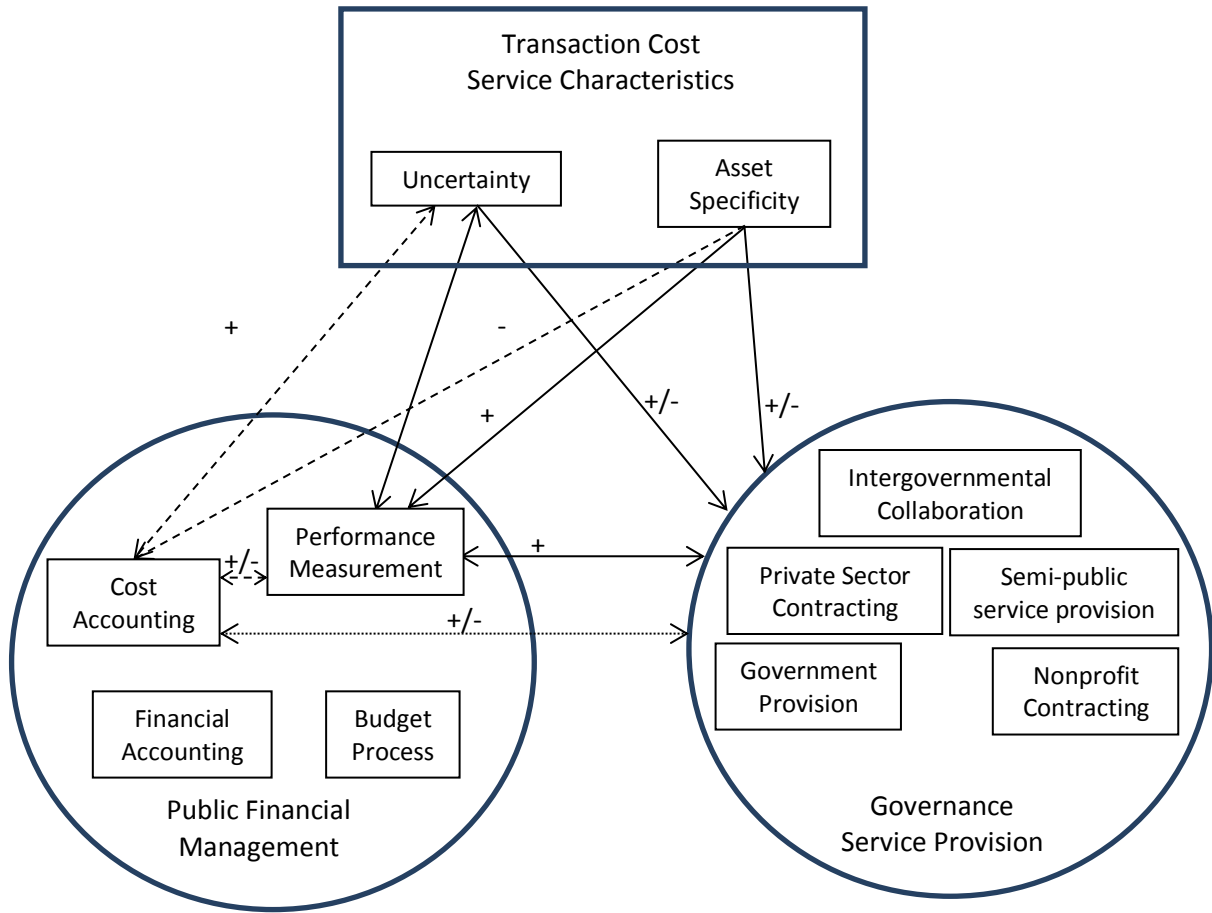


Figure 7.3: Model of Governance and Financial Management



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